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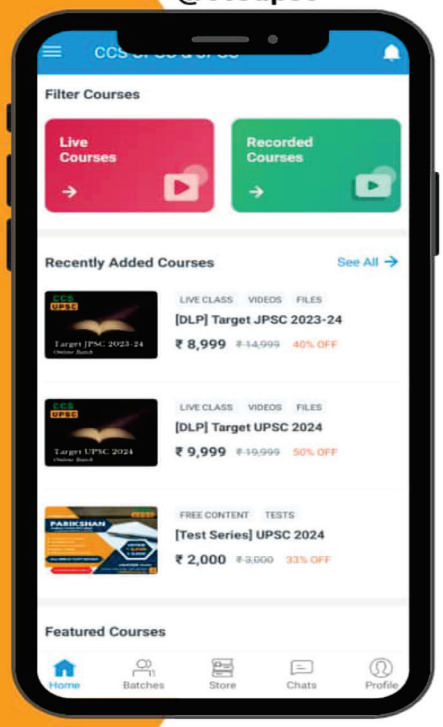

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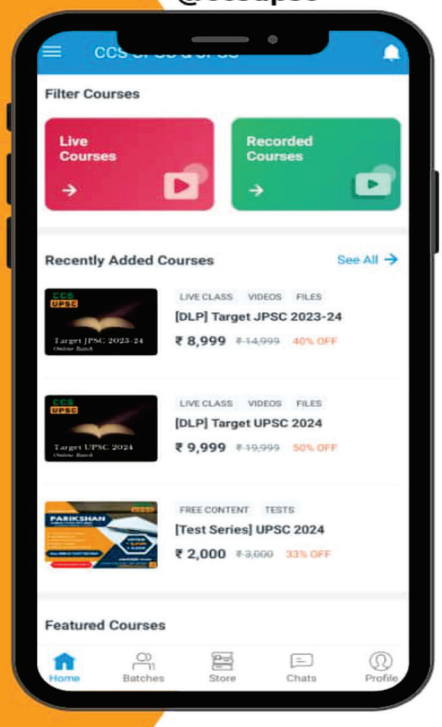

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July-2025

Current Affairs

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HISTORY & CULTURE

P.C. Mahalanobis

Context:

The 19th National Statistics Day was celebrated on June 29, 2025, marking the 132nd birth anniversary of Prof. P.C. Mahalanobis, with the theme '75 Years of National Sample Survey'.

About 19th Statistics Day:

- Statistics Day is observed every year on June 29 to recognize the legacy of Prof. Mahalanobis, known as the Father of Indian Statistics.
- Theme (2025): 75 Years of National Sample Survey (NSS)
- Celebrates the evolution and contributions of the NSS since its inception in 1950.

Objective:

- Promote awareness among youth about the importance of statistics in national planning and governance.
- Highlight innovations in real-time data monitoring, survey integration, and digital dissemination.

About P.C. Mahalanobis:

- Prasanta Chandra Mahalanobis (1893–1972) was a pioneering Indian statistician, planner, and institution-builder.

Key Contributions:

- Founder of Indian Statistical Institute (ISI): Established ISI Kolkata in 1931, advancing statistical education and research.
- Mahalanobis Distance (1936): A widely used multivariate statistical measure for identifying outliers and variation in data.

Architect of National Sample Survey (1950):

- Designed India's first household sample survey system, revolutionizing data-driven governance.
- His sampling techniques helped India become a global leader in official statistics.

Planner of India's Second Five-Year Plan:

- Advocated a heavy-industry-led economic model, known as the Mahalanobis model.
- Instrumental in shaping India's planned economy.
- Flood Management Studies: Provided statistical solutions for Bengal and Odisha floods, which prevented ineffective infrastructure spending.
- Journal 'Sankhya' Founder: Established India's first statistical journal to foster academic research in statistics.

Early Harappan Burial Discovery in Gujarat's Lakhapar

Context:

A 5,300-year-old Early Harappan settlement and burial discovered in Lakhapar village, Kutch, is shedding new light on cultural exchanges between Early Harappan and Chalcolithic groups.

About Early Harappan Burial Discovery in Gujarat's Lakhapar:

Location:

- The site is located in Lakhapar village, Kutch district, Gujarat.
- Excavation conducted by University of Kerala's Department of Archaeology.

What is the Discovery?

- A newly excavated Early Harappan habitation and burial site dated to c. 3300–2600 BCE.
- Builds on previous work at Juna Khatiya, another Early Harappan cemetery excavated nearby.

Key Findings:

Human Burial with Pre-Prabhas Pottery:

- First of its kind in Gujarat—buried directly in a pit with no markers or architecture.
- Pottery type links it to Chalcolithic cultures of Saurashtra (e.g., Prabhas Patan, Datrana).
- Harappan-Style Architecture: Sandstone and shale structures indicating planned construction and social organization.
- Cultural Interaction Evidence: Ceramics and habitation layers resemble Early Harappan sites in Sindh, pointing to cross-regional exchanges.
- Interconnected Settlement Network: Together with Juna Khatiya (197 burials), Lakhapar suggests a larger cultural sphere in Early Harappan Gujarat.

Significance of the Discovery:

- Expands Early Harappan Geography: Shows Harappan influence extended deeper into Western India than previously thought.
- Earliest Burial with Pre-Prabhas Pottery: Links Gujarat's Chalcolithic and Harappan cultures.
- Challenges Linear History Models: Highlights co-existence of foragers, agro-pastoralists, and urban precursors.
- Fills Data Gaps: Most Harappan burials are from Mature phase and this adds rare pre-urban insights.
- Strengthens Cultural Chronology: Reinforces Gujarat's role as a cultural bridge between Sindh and peninsular India.

Kolhapuri Chappal

Context:

India's traditional Kolhapuri chappal makers have objected to luxury brand Prada's 2026 collection, alleging unauthorised imitation of their heritage footwear design.

About Kolhapuri Chappal:

What it is?

- Kolhapuri chappals are handcrafted leather sandals, known for their durability, intricate design, and distinct open-toe, T-strap structure.
- Region of Origin: Traditionally made in Kolhapur and adjoining districts in Maharashtra and parts of Karnataka, such as Belgaum, Bagalkot, and Dharwad.

GI Tag:

- Received Geographical Indication (GI) status in 2019.
- Jointly registered by artisans from Maharashtra and Karnataka.
- The GI tag ensures only registered producers can market products under the "Kolhapuri" name.

History & Cultural Significance:

- Traces back to 13th century during the rule of King Bijjala and Basavanna.
- Symbolizes rural craftsmanship and sustainable fashion, often passed down through generations.

Unique Features:

- Made using vegetable-tanned buffalo hide without nails.
- Designs include traditional motifs and braided leather straps.
- The chappals are eco-friendly, breathable, and long-lasting.

GI Issue:

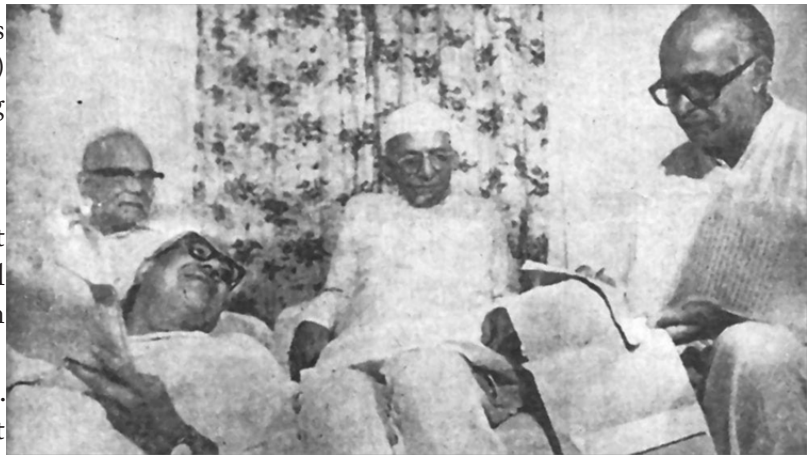
- GI laws protect origin-linked naming and collective practices.
- However, monetary compensation isn't permitted unless name or production process is misused.
- Since Prada didn't use the term Kolhapuri, infringement claims are weak under current frameworks.

Structural IP Issues:

- IP laws favour individual ownership, not community-based traditions.
- Traditional crafts lack documentation, novelty, and defined ownership—making them ineligible under patents or copyrights.

Total Revolution

Context:



The 51st anniversary of Jayaprakash Narayan's historic "Total Revolution" call (June 5, 1974) is being marked, highlighting its enduring influence on Indian politics.

About Total Revolution:

- Concept: A holistic non-violent movement for socio-political transformation based on Gandhian ideals.
- Launched by: Jayaprakash Narayan (JP).
- Year: Announced on June 5, 1974, at Gandhi Maidan, Patna.
- Objective: Achieve "Sampoorna Kranti" — a comprehensive change in economic, political, social, and cultural structures for a just and equitable society

Causes of Total Revolution:

- Electoral Malpractice & Judicial Verdict: The 1975 Allahabad HC judgment disqualifying Indira Gandhi for electoral malpractices delegitimised her authority, triggering mass protests.
- Student-Led Unrest: Widespread agitations in Gujarat's Navnirman Movement and Bihar's student protests exposed the growing youth frustration over unemployment and governance failures.
- Economic Crisis: Severe inflation (over 20%), unemployment, and food shortages in early 1970s aggravated public misery, fuelling disillusionment with the state.
- Erosion of Democratic Norms: Centralisation of power, use of draconian laws like MISA, and suppression of dissent alarmed the civil society and intelligentsia.
- Inspirational Leadership: JP's articulation of a 'party-less democracy' combined Gandhian ethics, Sarvodaya ideals and Marxist critique, galvanising a broad-based mass movement.

Components of Total Revolution:

- Political Revolution: Advocated bottom-up governance, participatory democracy, and accountability to counter bureaucratic centralism.
- Economic Revolution: Sought equitable land redistribution and people-centric development to tackle socio-economic disparities.
- Social Revolution: Championed eradication of casteism, gender discrimination and dowry to build an egalitarian society.
- Educational Revolution: Proposed ethics-based curriculum with focus on civic duties, rural development and vocational empowerment.
- Cultural-Spiritual Revolution: Aimed at fostering self-discipline, national unity and moral rejuvenation through individual transformation.

Impact of Total Revolution:

Impact on People:

- Youth Political Mobilisation: Catalysed entry of new political actors—Lalu Prasad, Nitish Kumar, Sushil Modi—who reshaped Bihar's polity for decades.
- Civic Consciousness: Deepened citizen engagement in democratic processes, making public accountability a mainstream discourse.
- Non-Violent Resistance: Reasserted the power of peaceful protest against authoritarianism, influencing movements like Anna Hazare's anti-corruption crusade.

Impact on Governance:

- Rise of Non-Congress Coalition: Unified Opposition during Emergency laid ground for the Janata Party's historic 1977 electoral victory.
- Constitutional Safeguards: Triggered reforms through the 44th Amendment, ensuring checks on Emergency powers and restoring judicial oversight.
- Decentralisation Drive: Influenced future Panchayati Raj reforms (73rd, 74th Amendments), enhancing grassroots democratic participation.

Significance of Total Revolution:

- Revival of Dissent Tradition: Reaffirmed dissent as a democratic right, legitimising protest in postcolonial India.
- New Leadership Pipeline: Created a fresh generation of leaders with mass roots—many of whom dominated Indian politics for decades.
- Institutional Resilience: Exposed systemic vulnerabilities, catalysing institutional reforms to safeguard democratic structures.
- Expanded Public Sphere: Widened space for civil society participation, influencing governance beyond electoral politics.
- Contemporary Lessons: Offers enduring relevance in tackling present-day issues like centralisation, youth alienation, and democratic erosion.

Conclusion:

JP's Total Revolution was more than a political upheaval—it envisioned ethical, social, and democratic regeneration. Though utopian in parts, it redefined public participation and governance in India. Its legacy continues to inspire movements for justice and democratic reform.

Ambubachi Mela 2025

Context:

Thousands of devotees are attending the Ambubachi Mela 2025 at Assam's Kamakhya Temple, which celebrates the annual menstruation of Goddess Kamakhya, a key event in Tantrik Shaktism.

About Ambubachi Mela 2025:

What is it?

- Ambubachi Mela is an annual religious festival held at Kamakhya Temple, Guwahati.
- It marks the menstrual cycle of Goddess Kamakhya, symbolising the fertility of the earth.
- The term "Ambubachi" means "water flowing," linking the festival with monsoon rains and fertility.

Uniqueness of Ambubachi Mela:

- No idol is worshipped—the natural process of menstruation is revered.
- Temple remains closed during the period and reopens ceremonially.
- Fertility and agriculture-related practices pause during this time, highlighting the festival's deep socio-cultural significance.
- Cloth pieces stained with symbolic marks are distributed as protective amulets.

About Kamakhya Temple:

What is it?

- One of the most sacred Shakti Peethas and a major Tantric worship site in India.
- Symbolises the union of Aryan and non-Aryan spiritual practices.
- Location: Situated on Nilachal Hills, around 7 km from Guwahati city, Assam.

Built by:

- The original structure was destroyed by Kala Pahar.
- Reconstructed in 1565 by Chilarai, king of the Koch dynasty.

History & Legends:

- Linked to the legend of Sati, whose reproductive organ is believed to have fallen here.
- Associated with Goddess Kali and other forms of Shakti—Sundari, Tripura, Tara, Bagalamukhi, Chinnamasta, among others.

Architecture:

Comprises three chambers:

- Rectangular western chamber
- Square middle chamber (with inscriptions and images of Naranarayana)
- Inner cave-like chamber housing the yoni-shaped cleft with a natural spring flowing through.
- Also houses temples dedicated to Lord Shiva (five temples) and Lord Vishnu (Kedara, Gadadhara, Pandunath).

11th International Day of Yoga

Context:

The 11th International Day of Yoga (IDY) will be observed on June 21, 2025, with the theme "Yoga for One Earth, One Health"; global participation has grown from 9 crore in 2018 to 24.53 crore in 2024.

About 11th International Day of Yoga:

What it is?

- An annual global observance promoting yoga as a holistic health practice for mind-body balance, harmony with nature, and sustainable well-being.
- Celebrated Since: Officially recognised by UNGA resolution 69/131 on Dec 11, 2014.
- First celebrated globally on June 21, 2015.
- Theme (2025): "Yoga for One Earth, One Health" — emphasising the link between personal well-being and planetary health, aligned with India's G20 One Earth vision.

Objectives:

- Promote physical, mental, emotional well-being through yoga.
- Foster global awareness on yoga's health and environmental benefits.
- Encourage integration of yoga into daily life for sustainable living.

Strengthen India's cultural diplomacy

Key Features:

- Global Movement: Adopted by 175 UN member states and participation grown to 24.53 crore globally in 2024.
- Mass Participation: Led by Ministry of AYUSH, with support from state govts, embassies, UN bodies.
- Inclusive Message: Logo and theme promote unity, harmony with nature, and mind-body integration.
- Cultural Diplomacy: Strengthens India's image as the cradle of yoga tradition and global wellness leader.
- Sustainability Alignment: Highlights yoga's role in health, climate consciousness, and sustainable development.

Significance:

- Promotes a low-cost, accessible wellness practice
- Builds soft power and cultural leadership for India.
- Reinforces the connection between individual well-being and environmental stewardship.

Servants of India Society

Context:

The Gokhale Institute of Politics and Economics (GIPE) has demanded the appointment of a neutral administrator for the Servants of India Society (SIS), citing alleged financial mismanagement.

About Servants of India Society:

What is SIS?

- The Servants of India Society (SIS) is a historic socio-political organisation committed to public service, civic engagement, and national education. It aimed to build a cadre of selfless leaders devoted to the upliftment of India.
- Established on: June 12, 1905 (2025 marks its 120th Anniversary as well)

Place: Pune, Maharashtra

- Founders: Gopal Krishna Gokhale, G.K. Devadhar, A.V. Patwardhan, N.A. Dravid

Objectives:

- Train individuals for public service in a religious and nationalistic spirit.
- Promote education, civic duty, and political awareness through constitutional means.
- Encourage youth engagement in national development.

Activities in Pre-Independence Era:

- Played a pivotal role in India's freedom movement through political education.
- Produced leaders like V.S. Srinivasa Sastri, Hriday Nath Kunzru, A.V. Thakkar.
- Gokhale mentored Gandhi and also funded Sabarmati Ashram's setup.
- Advocated constitutional reforms, social service, and nation-first ethics.

Post-Independence Contributions:

- Expanded focus to education, women's rights, rural upliftment, and disaster relief.
- Operates schools, rural development programs, and child welfare initiatives.
- Promotes sustainable agriculture, clean water access, and healthcare camps.
- Stands for gender justice, fighting child marriage, widow discrimination, and inheritance inequality.
- Gokhale Institute of Politics and Economics, a UGC-affiliated body founded under Servants of India Society.

Sant Kabir Das

Context:

Sant Kabirdas Jayanti was celebrated on June 11, marking his 648th birth anniversary.

- This occasion honours the 15th-century poet-saint's timeless contribution to spiritual unity and social reform.

About Sant Kabir Das:

Who Was Sant Kabir Das?

- Sant Kabirdas was a 15th-century mystic poet, Bhakti saint, and social reformer who lived in Varanasi, Uttar Pradesh.
- Believed to be born in 1440 and raised by a Muslim weaver family, Kabir's life symbolized religious convergence and spiritual universality.
- He authored Bijak, Sakhi Granth, Kabir Granthavali, Anurag Sagar, and many of his verses appear in the Guru Granth Sahib

Kabir and His Philosophy:

- God resides within: Kabir taught that true divinity lies in self-realisation, not in temples or rituals. He urged seekers to introspect rather than perform empty ceremonial acts.
- Nirguna Bhakti: He rejected anthropomorphic deities and propounded devotion to a formless, universal divine consciousness (Nirguna Brahman).
- Human dignity over ritual: He opposed religious dogmas and caste-based discrimination, promoting ethical conduct as superior to ritual purity.
- Seva and Simplicity: Kabir emphasized humility, charity, and remembrance of God's name (Nam-smaran) as the path to spiritual liberation.
- Social Equality: He questioned hereditary hierarchy, upheld non-violence (Ahimsa), and declared all beings equal in the eyes of the divine.

Kabir's Influence on Sects:

- Kabir Panth: A spiritual order based on Kabir's teachings emerged, spreading his egalitarian philosophy across villages and towns in northern India.
- Influenced Sikhism: Guru Nanak admired Kabir's thought; many of his verses are enshrined in the Guru

Granth Sahib, shaping Sikh devotion and ethics.

- Dadu Panthis & others: Kabir's inclusive and non-sectarian teachings inspired several movements that challenged orthodoxy and ritualism.
- Cross-religious following: Hindus and Muslims alike revered him, seeing in him a figure that transcended religious divisions and embodied spiritual truth.

Relevance of Kabir's Philosophy in the Modern World:

- Religious Harmony: In an age of rising intolerance, Kabir's teachings offer a bridge between communities through shared spiritual values.
- Social Justice: His critique of caste and privilege aligns with today's constitutional ideals of equality and dignity for all.
- Minimalism and Sustainability: His advocacy of contentment and simplicity provides philosophical grounding for sustainable living.
- Humanism over Ritualism: Kabir's focus on inner purity and conduct resonates with modern ethical discourse beyond religious boundaries.
- Spiritual Inclusivity: He legitimised multiple paths to truth, promoting tolerance for diverse beliefs in an increasingly pluralistic world.

Conclusion:

Sant Kabir Das remains a beacon of moral courage, spiritual universality, and social justice. His couplets, rooted in simplicity, cut across time and still inspire unity, reflection, and reform. In an age of polarisation, Kabir's words echo as a call for compassion and conscience.

Chapter-
2

POLITY

Bihar Launches India's First Mobile e-Voting System in Local Body Polls

Context:

Bihar has become the first Indian state to implement mobile phone-based e-voting in local body elections, recording 70.2% participation via the app-based platform.

About Bihar Launches India's First Mobile e-Voting System in Local Body Polls:

What is It?

- A mobile-based electronic voting system allowing eligible voters to cast their votes remotely using a secure mobile application, E-SECBHR, during Bihar's urban local body elections.
- Developed By: The e-voting app and system were developed by the Centre for Development of Advanced Computing (C-DAC).

Objective:

- Enable inclusive, accessible, and contactless voting.
- Improve voter turnout among the elderly, disabled, pregnant women, and those unable to travel to booths.
- Promote digital empowerment and electoral convenience.

How It Works?

- Voter downloads the E-SECBHR mobile app (currently Android only).
- Links mobile number as per the electoral roll.
- Upon verification via Voter ID, user gains access to vote through the app or official SEC website.
- Voting is permitted only on election day.

Key Features:

- User-Friendly Mobile App: Secure, intuitive UI designed for quick voting.
- Remote Voting Capability: Empowers people who cannot physically visit polling booths.
- Biometric Verification: Uses facial recognition to verify voter identity.
- Real-Time Monitoring: Backend tracks system health and user access in real time.
- Multilingual Support: Accessible to a wider user base across linguistic barriers.

Methods to Prevent Tampering:

- Blockchain Technology: Ensures all votes are securely recorded and immutable.
- Facial Recognition: Matches real-time image with stored data to confirm identity.
- Login Restrictions: Only two users per mobile number and unique Voter ID required for authentication.
- Digital Audit Trail: Every action is logged for accountability and transparency.

Impact and Significance:

- Bibha Kumari from East Champaran became the first Indian voter to cast her vote through a mobile phone.
- Sets the precedent for digital electoral reform and smart governance.
- Could inform future implementations at state or national election levels.

Registered Unrecognised Political Parties (RUPPs)

Context:

The Election Commission of India (ECI) has initiated the delisting of 345 Registered Unrecognised Political Parties (RUPPs) that have not contested any elections since 2019 and are physically untraceable.

About Registered Unrecognised Political Parties (RUPPs):

- RUPPs are political entities registered under Section 29A of the Representation of the People Act, 1951, but not yet recognised as State or National parties.
- Privileges: They enjoy income tax exemptions and can receive political donations, even without electoral participation.
- Scale: India has over 2,800 RUPPs as of 2025. According to ADR, their number doubled from 1,112 in 2010 to 2,301 in 2019.
- Status: Nearly 97% of all registered parties are unrecognised, yet most do not file mandatory financial disclosures.

Features and Criteria for Recognised Political Parties:

State Party: A registered party must meet any one of the following:

- 6% Vote + 2 Assembly Seats: The party must secure at least 6% of the valid votes polled in the Legislative Assembly election and win at least 2 seats in that Assembly.
- 6% Vote + 1 Lok Sabha Seat: It must win at least 6% of valid votes in the Lok Sabha election held in that state and secure 1 seat in Lok Sabha from that state.
- 3% of Assembly Seats or 3 Seats Minimum: The party must win at least 3% of the total Assembly seats, or at least 3 seats (whichever is higher) in the Legislative Assembly.
- 1 of Every 25 Lok Sabha Seats: The party must win 1 Lok Sabha seat out of every 25 seats allocated to the state.
- 8% Vote Share: It must secure at least 8% of the total valid votes in a state, either in Lok Sabha or Assembly elections, even if it wins no seats.

National Party: A registered party must meet any one of the following:

- 6% Vote in 4 States + 4 Lok Sabha Seats: The party must secure at least 6% of valid votes in Lok Sabha or Assembly elections in four or more states, and win at least 4 Lok Sabha seats from any states.
- 2% Lok Sabha Seats from 3 States: It must win at least 2% of the total Lok Sabha seats (currently 11 out of 543), and those seats must be from at least 3 different states.
- Recognized as State Party in 4 States: If a party is recognized as a State Party in four or more states, it automatically qualifies as a National Party.

Structural and Functional Issues with Registered Unrecognised Political Parties (RUPPs):

- Electoral Inactivity: Many RUPPs haven't contested any election since 2019, raising doubts about their political purpose.
- Funding Opacity: Less than 5% submitted donation reports (2013–2016), reflecting weak compliance with financial disclosure norms.
- Tax Loophole Misuse: They misuse Section 13A of the IT Act to claim tax exemptions despite zero electoral activity.
- No Verifiable Presence: Many lack traceable offices or functioning bodies, violating norms under Section 29A of the RPA, 1951.
- Election-Year Surge: Registrations spike during election cycles, often linked to shady donation flows and proxy operations.

Way Ahead:

- Delisting dormant parties: EC must periodically remove non-functional entities from its register.
  E.g., Current move to delist 345 RUPPs.
- Strengthen registration norms: Include mandatory participation criteria and stricter financial disclosures.
- Regular audits: Subject inactive RUPPs to IT scrutiny and EC compliance checks.
- Digital oversight tools: Promote Political Parties Registration Tracking Management System (PPRTMS) for transparency and real-time status updates.
- Public disclosure: State CEO websites must update party status, audit report filings, and compliance history.

Conclusion:

The delisting of inactive RUPPs is a long-overdue reform to clean up the electoral landscape. It ensures that political privileges aren't misused for money laundering or tax evasion. Strengthening party registration, enforcing accountability, and regular audits are essential to uphold electoral integrity and democratic transparency.

Gender Equity in Urban Bureaucracy

Context:

A recent policy insight by Janaagraha stressed that while women now make up nearly 46% of elected representatives in local governments, urban bureaucracies—especially planners, engineers, and police—remain male-dominated, undermining inclusive governance.

About Gender Equity in Urban Bureaucracy:

Definition:

- Gender equity in bureaucracy refers to equal representation, opportunity, and influence for women in administrative and technical city roles such as municipal officers, urban planners, engineers, and law enforcement.

Data:

- Women in IAS: Only about 20% of IAS officers are women as of 2022.
- Local government representation: While women hold over 46% of elected seats in urban local bodies, their administrative influence remains limited.
- Women in police force: Just 11.7% of India's police personnel are women, with most in desk roles, according to Bureau of Police Research & Development data.
- Engineering sector representation: Women constitute only 14% of engineers in the workforce, despite making up 40% of STEM graduates.

Why Urban Bureaucracy Needs Gender Equity?

- Inclusive Planning & Design: Women professionals incorporate caregiving roles, travel habits, and safety concerns into planning.
  E.g., 84% of women in Delhi/Mumbai use shared or public transport (ITDP-Safetipin).
- Localized Infrastructure Prioritization: Women focus more on lighting, toilets, healthcare, and water — services directly linked to everyday wellbeing.
  E.g., Safetipin audit shows over 60% of public spaces in cities lack proper lighting.
- Empathy in Law Enforcement: Women in police roles reduce reporting barriers for domestic violence and sexual harassment.
  E.g., BPR&D data shows only 11.7% of police are women, affecting community trust.
- Better Stakeholder Communication: Women bureaucrats often improve citizen engagement through inclusive, participatory methods.
  E.g., Kerala's Kudumbashree has enhanced responsiveness of local governance structures.
- Bridging Policy-Implementation Gaps: Elected women in ULBs (now 46%) need bureaucratic counterparts to translate priorities into outcomes.

Impacts of Gender-Inclusive Bureaucracy:

On People:

- Improved Women's Safety in Public Spaces: More female officers help ensure better lighting, surveillance, and safer public areas.
- Enhanced Public Transport Access: Infrastructure reflects women's mobility patterns (multi-stop, off-peak hours).

  E.g., Delhi's women-only buses emerged from GRB influence.
- Social Inclusion of Marginalized Groups: Women's governance styles often include elderly, disabled, children in urban design.
- Upliftment of Low-Income Urban Women: Better sanitation and housing facilities are prioritized by women administrators.

  E.g., Brazil's women-led cities focused on slum upgrading and maternal health.

On Governance:

- Institutionalization of GRB Practices: Representation drives structured gender budgeting, as seen in Kerala and Tamil Nadu.
- Citizen-Centric Governance: Women's presence ensures programs align with lived realities — not just economic goals.
- Better Law & Order Outcomes: Increased trust and reporting due to gender-sensitive policing enhances rule of law.
- Improved Governance Trust: Women leaders reduce corruption and increase transparency (UNDP, ICRIER studies).
- Strengthened Local Democracy: Balanced administration reflects participative values enshrined in 74th Constitutional Amendment.

Key Challenges:

- Structural Barriers in Entry: Fewer women in engineering, policing, and planning due to lack of scholarships, support systems.

  E.g., Less than 10% of town planners in ULBs are women (MoHUA reports).
- Workplace Discrimination and Glass Ceilings: Gender bias in promotions, hostile work environments, and limited mentoring hinder career growth.
- Lack of Gender-Disaggregated Data: Without detailed data, city policies fail to capture differential needs of women and men.
- Tokenism in GRB Implementation: Many GRB allocations are symbolic without real planning or monitoring.

  E.g., Most ULBs do not track gender outcomes of budget lines (NIPFP & UN Women).
- Weak Institutional Mechanisms for Gender Equity: Absence of gender councils or mandatory audits at city level reduces accountability.

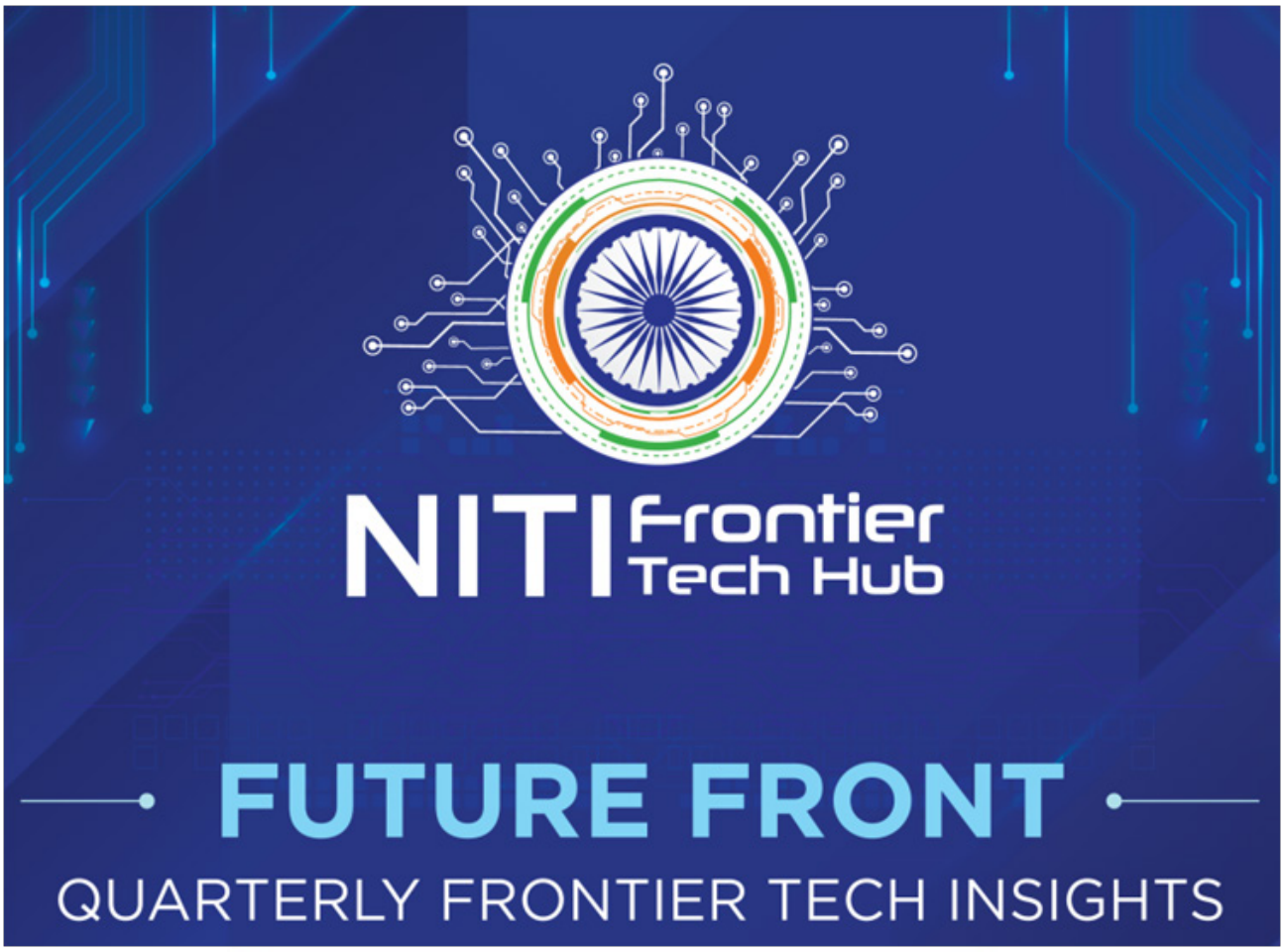
Conclusion:

For urban India to be inclusive, gender balance must shift from politics to bureaucracy. Women in leadership can only be effective if mirrored in the technical ecosystem that supports them. Inclusive cities begin with inclusive governance structures.

NITI Aayog India's Data Imperative Report

Context:

NITI Aayog released its report "India's Data Imperative: The Pivot Towards Quality", recommending urgent reforms to improve the quality of India's public data ecosystem.



About NITI Aayog India's Data Imperative Report:

What it is?

- India's data ecosystem refers to the vast network of digital public infrastructure, platforms, and databases that power governance, welfare delivery, and financial inclusion across both public and private sectors.
- It integrates identity (Aadhaar), financial (UPI), health (Ayushman Bharat), and social schemes through data-driven platforms.

Key Data Points:

1. Aadhaar: Over 27 billion authentications conducted in FY 2024–25 — backbone of identity-linked service delivery.
2. UPI: 23.9 trillion worth of transactions processed monthly — world's largest real-time payment system.
3. Ayushman Bharat: 369 million Ayushman Bharat Digital Health IDs issued — transforming health data interoperability.
4. Direct Benefit Transfer (DBT): 5.47 lakh crore transferred via DBT to beneficiaries in FY 2024–25, covering 330+ schemes.
5. Aadhaar e-KYC: 1.8 billion e-KYC transactions completed in FY 2024–25, reducing onboarding costs across sectors.
6. Digital India penetration: 1.2 billion mobile subscribers; 800 million internet users — one of the world's largest digital user bases

Need for Robust Data Ecosystem:

- Prevent Fiscal Leakage: Inaccurate data leads to duplicate or erroneous beneficiaries, causing 4–7% excess welfare spending each year.
- Enable Evidence-Based Governance: High-quality data is the backbone for AI-driven insights and precise targeting of government schemes and interventions.
- Build Public Trust: Citizens' trust in digital governance rests on the ability of public systems to deliver

accurate, reliable, and timely services.

- Strengthen India's AI Ecosystem: AI models and platforms depend on clean and validated data to drive innovation in healthcare, agriculture, and e-governance.
- Improve Cross-Ministerial Coordination: Interoperable, accurate data allows for better policy alignment across departments, improving the efficiency of public service delivery.

Challenges in India's Data Ecosystem:

- Fragmentation: Government data systems remain siloed, with incompatible formats and platforms across ministries hindering seamless usage.
- Lack of Ownership: No clear custodian or accountable body is responsible for end-to-end data quality across national and state departments.
- Legacy IT Systems: Outdated digital infrastructure delays real-time updates and obstructs seamless interoperability across modern platforms.
- Incentive Mismatch: Current practices reward fast data entry rather than prioritising accuracy and validation, compromising data integrity.
- Poor Quality Culture: An informal acceptance of "80% accuracy is good enough" reduces accountability and leads to systemic data errors over time.

Recommended Way Ahead:

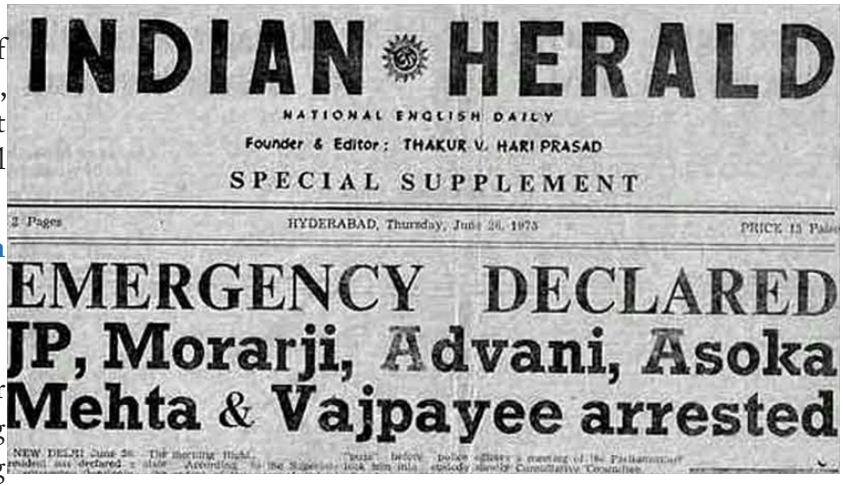
- Institutionalising Ownership: Appoint dedicated data custodians at national, state, and district levels.
- Incentivising Quality: Integrate error rates and data quality metrics into performance reviews and budget incentives.
- Promote Interoperability: Standardise data formats using IndEA, NDGFP frameworks to break silos.
- Deploy Practical Tools: Adopt NITI Aayog's Data Quality Scorecard and Maturity Framework for regular self-assessment.
- Invest in Capacity Building: Train field staff and managers to uphold data fidelity as a core responsibility.

Conclusion:

NITI Aayog's data quality framework is a vital step toward precision-driven governance. India must now embed data stewardship, incentives, and interoperability across all levels to ensure public trust and maximise the benefits of its digital infrastructure.

50th anniversary of the declaration of Emergency

Context:


INDIAN HERALD
NATIONAL ENGLISH DAILY
Founder & Editor: THAKUR V. HARI PRASAD
SPECIAL SUPPLEMENT
2 Pages HYDERABAD, Thursday, June 26, 1975 PRICE 15 Paise
EMERGENCY DECLARED
JP, Morarji, Advani, Asoka Mehta & Vajpayee arrested

25 June 2025 marks the 50th anniversary of the declaration of Emergency (1975–77), prompting national reflection on its impact on India's democracy and constitutional framework.

About 50th anniversary of the declaration of Emergency:

What it is?

- The Emergency was declared under Article 352 on 25 June 1975, citing "internal disturbance", suspending civil liberties and altering governance structures across India.
- Period: Lasted from 25 June 1975 to 21 March 1977.

Events Leading to the Emergency:

- Growing unrest from student agitations, inflation, unemployment and corruption allegations.
- Major protests led by Jayaprakash Narayan (Total Revolution) across Bihar and Gujarat.
- Allahabad High Court (12 June 1975) convicted PM Indira Gandhi of electoral malpractice; calls for her resignation intensified.

Key Events During the Emergency:

- Article 358 & 359 invoked — suspending Fundamental Rights (Articles 14, 19, 21, 22).
- Over 35,000 political prisoners detained under MISA.
- Severe media censorship enforced and newspapers and films tightly controlled.
- Sterilisation campaign: Over 1.07 crore procedures conducted (1975–77), with coercion reported.
- 42nd Constitutional Amendment: Strengthened executive, curtailed judicial review, extended Lok Sabha terms to 6 years.

Post-Emergency Developments:

- Emergency ended in March 1977 after Congress party's electoral defeat.
- Shah Commission (1977) exposed abuses — arbitrary arrests, forced sterilisation, media suppression.
- 44th Constitutional Amendment (1978): Tightened Emergency provisions — replaced "internal disturbance" with "armed rebellion", restored judicial oversight.

Estimate Committee

Context:

Lok Sabha Speaker inaugurated the National Conference of Estimates Committees in Mumbai to commemorate 75 years of the Parliamentary Estimates Committee.

About Estimate Committee:

What it is?

- A key financial oversight committee of the Parliament of India that examines how government funds are allocated and spent, ensuring economy, efficiency, and accountability.
- Established in: 1950, post-Constitution, under the Rules of Procedure of Lok Sabha.
- Members: Consists of 30 Members of Parliament (Lok Sabha) but Ministers are excluded.
- Selection Process: Members are elected annually by Lok Sabha members, through proportional representation by means of a single transferable vote.

The Chairperson is appointed by the Lok Sabha Speaker.

- Term: One-year term and term are renewable in nature

Key Functions

- Review government estimates: Examines how money is allocated and suggests reforms for economy and efficiency.
- Recommend policy improvements: Proposes alternative policies for better public administration and budget management.
- Evaluate spending efficacy: Assesses whether public funds are being spent effectively as per approved policies.
- Suggest improvements in presentation: Recommends ways to improve how budget estimates are presented in Parliament.
- Exclusions: Does not review Public Undertakings—covered by a separate committee.

Working Process:

- Committee selects estimates from Ministries/Departments/statutory bodies for scrutiny.
- Calls for information from government and non-official sources.
- Conducts Study Visits (on-ground assessments) with prior approval.
- Holds formal evidence sessions at Parliament.
- Publishes Reports to Lok Sabha with findings and recommendations.
- Government must respond within six months via Action Taken Reports (ATR).

Achievements:

Since inception in 1950, the Committee has presented 1184 reports:

- 656 Original Reports
- 528 Action Taken Reports
- Covered almost all major Ministries and Departments.
- Contributed significantly to strengthening financial oversight and promoting fiscal accountability.

Fair Dealing in India

Context:

A copyright and defamation dispute between ANI and YouTuber Mohak Mangal has raised critical questions on India's ambiguous fair use laws in the digital era.

About ANI vs Mohak Mangal dispute:

- ANI filed multiple copyright strikes against Mohak Mangal for using short ANI video clips in at least 10 of his YouTube videos.
- Mangal countered these claims citing fair dealing, accusing ANI of extortion and misuse of copyright provisions.
- ANI additionally filed a case on trademark infringement, defamation, and disparagement, and sought removal of certain videos and tweets.

About Fair Dealing in India:

- What is Fair Use (Fair Dealing)?
- Fair dealing, defined under Section 52(1) of the Copyright Act, 1957, permits limited use of copyrighted material without permission. It applies when the purpose is educational, critical, journalistic, or research-based, ensuring balance between creators' rights and public interest.

Criteria for Fair Use (Qualitative Factors):

- Purpose of Use: When the intent is to inform, educate, or critique—such as in journalism or parody—the use is more likely to be fair. Commercial exploitation or content meant to mislead would fall outside the scope of fair dealing.
- Nature of Work: The use of factual, published, or publicly accessible works tends to be more permissible than unpublished or highly creative works.
- Amount Used: Using small, necessary portions increases the chances of fair use, but even short clips can infringe if they capture the essence of the original.
- Market Impact: Fair use is invalidated if the copied content harms the original's revenue, substitutes the original, or diverts its audience. The greater the economic loss to the copyright holder, the lesser the chance of qualifying as fair dealing.
- Example: In TV Today vs NewsLaundry, limited use of video clips was accepted under fair use since it neither caused financial loss nor undermined the original broadcast's value.

Other IP Instruments in news:

- Trademark Disparagement: This refers to using a registered trademark in a way that damages its image, credibility, or public perception.
- In this case, the Delhi High Court asked Mangal to delete remarks seen as harming ANI's brand reputation.
- De Minimis Doctrine: Under this principle, minor or trivial uses of copyrighted material may not attract legal scrutiny.

Need for Fair Use Clarity in India's Digital Ecosystem:

- Digital Expansion Demands Legal Precision: With over 850 million internet users and thousands of content creators, digital India needs clear fair use boundaries.
- AI-Based Takedowns Ignore Indian Law: Global platforms like YouTube apply U.S. DMCA protocols, bypassing Indian copyright exceptions. This often results in wrongful removals of content that would be legal under Section 52.

- Satire, Review, and Education Need Protection: Fair use shields socially relevant content like documentaries, news critique, and parody. Without safeguards, creators may self-censor or face disproportionate legal threats.
- Example: Mohak Mangal's video was taken down by YouTube under DMCA, despite invoking Indian fair dealing for public interest reporting.

Challenges in the Current Fair Use Framework:

- No Defined Duration or Scope: Indian law lacks numerical limits or time thresholds, making it hard for creators to know how much is "too much." This vagueness increases legal risks and dependency on judicial interpretation.
- Platform-Law Discrepancy: YouTube and other platforms operate on global algorithms that don't recognise Indian fair use clauses. As a result, even lawful content under Indian law is penalised based on foreign standards.
- Weaponization of Copyright Strikes: Rights holders can misuse copyright takedown tools to suppress criticism or extract payments.
- Low Awareness Among Digital Creators: Many YouTubers and educators are unaware of their fair use protections under Indian law.
- High Judicial Discretion and Cost: Since fair use is judged case-by-case, creators must often go through expensive litigation for clarity. Absence of consistent precedent weakens confidence in creative freedoms.

Way Forward:

- Introduce Statutory Guidelines on Fair Use: Parliament or the Supreme Court must lay down clear boundaries—like time, purpose, and market harm.
- Regulate Platform-Based Takedowns: Rule 75 of the Copyright Rules should be enforced, ensuring content restoration if no court order is obtained in 21 days.
- Educate Creators on Their Rights: Awareness campaigns, in partnership with civil society and digital platforms, can empower users.
- Develop a Uniform Judicial Doctrine: A standardised fair use test from the Supreme Court or Law Commission will ensure predictability.
- Penalise Misuse of Takedown Systems: There should be strict consequences for entities that file malicious or repetitive copyright strikes.

Conclusion:

India's fair use regime offers valuable flexibility but suffers from poor enforcement and vague boundaries in the digital era. Clarity, platform accountability, and legal literacy must go hand in hand to preserve freedom of expression online. The ANI vs Mangal case is a pivotal moment for shaping copyright jurisprudence in India's digital future.

Aircraft Accident Investigation Bureau (AAIB)

Context:

A tragic Air India aircraft crash near Ahmedabad airport has prompted the Aircraft Accident Investigation Bureau (AAIB) to launch a formal probe, following global ICAO standards.

About Aircraft Accident Investigation Bureau (AAIB):

What is AAIB?

- A statutory investigative body responsible for probing aircraft accidents and serious incidents in Indian airspace.
- Headquarters: New Delhi
- Ministry: Ministry of Civil Aviation
- Established: 30 July 2012
- Legal Basis: Aircraft (Investigation of Accidents and Incidents) Rules, 2017

- Global Linkage: Annex 13 of the Chicago Convention (1944) under ICAO

Mandate and Jurisdiction:

Investigates accidents/serious incidents involving:

- Aircraft with AUW > 2,250 kg
- All turbojet aircraft
- May investigate smaller aircraft cases if necessary for public safety.

Core Functions:

- Investigation & Classification: Categorises aviation occurrences into accidents, serious incidents, and incidents.
- Final Reports: Prepares public reports after DG's approval; forwarded to ICAO and affected States.
- Safety Recommendations: Sent to DGCA or foreign regulators for policy-level implementation.
- Safety Studies: Analyzes systemic aviation risks and recommends long-term reforms.
- Legal Support: Assists courts and assessors as per Rule 12 of 2017 Rules.

Corporate Governance

Context:

India has witnessed a surge in corporate governance failures, with recent scandals involving Gensol Engineering, BluSmart, BharatPe, GoMechanic, and DHFL.

About Corporate Governance:

What is Corporate Governance?

- Corporate governance refers to the system of rules, practices, and processes that direct and control companies.
- It ensures accountability, transparency, and integrity in managing stakeholder interests, particularly in financial and ethical decision-making.

Core Principles of Corporate Governance

- Fairness: All stakeholders—including shareholders, employees, suppliers, and communities—must be treated equitably and with integrity, ensuring no undue advantage to any party.

  E.g. Equal voting rights for minority shareholders.
- Transparency: Companies must maintain open and timely disclosure of material information such as financials, risks, and conflicts of interest to stakeholders.

  E.g. Quarterly audited statements improve trust and accountability.
- Risk Management: Boards and management must identify, evaluate, and mitigate financial, operational, and reputational risks, and communicate these to relevant stakeholders.

  E.g. ESG risk disclosures mandated under SEBI norms.
- Responsibility: The board has the duty to oversee management, ensure long-term company performance, and act in the best interests of shareholders.

  E.g. CEO appointment and strategic direction fall under board responsibility.
- Accountability: Company leadership must be answerable for performance outcomes, strategic choices, and the company's adherence to ethical and financial standards.

  E.g. Annual general meetings promote board accountability.

Reasons Behind Corporate Governance Failures:

- Diversion of Investor Funds: Misuse of funds for personal expenses instead of core business goals.
  E.g. Gensol promoters allegedly used EV funds to buy luxury residences.
- Non-disclosure of Related-Party Transactions: Funds routed through promoter-controlled shell companies.
  E.g. BluSmart diverted capital using opaque loops, breaking disclosure norms.
- Falsified Financial Reporting: Misstated revenues and forged documents to attract funding.
  E.g. GoMechanic admitted to inflating revenue figures; Satyam did the same at scale.
- Weak Board Supervision: Lack of independent checks due to promoter-controlled boards.
  E.g. Directors lacked authority to intervene in fraudulent activities.
- Lack of Compliance Systems: No real-time monitoring of transactions or compliance red flags.
  E.g. No internal control detected Gensol's lifestyle fund misuse.
- Information Asymmetry: Investors misled by false representations and lacked due diligence.
  E.g. Gensol investors loaned large sums without verifying financial claims.

Measures to Improve Corporate Governance:

- Independent Board Oversight: Mandatory inclusion of independent, empowered board members to counter promoter influence.
- Tiered Financial Controls: Escalation protocols for high-value or strategic transactions to ensure checks and balances.
- External Audits and Audit Committees: Regular audits by reputed third parties and active audit committee oversight.
- Whistle-blower Mechanism: Anonymous reporting with anti-retaliation safeguards to detect internal fraud early.
- Conflict of Interest Declarations: Mandatory declarations and board reviews of any related-party dealings.
- Ethics as Strategy: Promote governance not just as compliance, but a core element of sustainable strategy.

Conclusion:

The recent wave of governance scandals highlights that growth without integrity is unsustainable. For companies, robust governance is no longer optional—it is a strategic necessity. Embedding transparency, accountability, and ethical leadership is key to rebuilding public trust and investor confidence.

Centre's New Regulations for Ladakh

Context:

The Central Government has notified five new regulations for the Union Territory of Ladakh.

- These rules aim to address long-standing demands related to domicile rights, local employment, cultural identity, and administrative reforms.

About Centre's New Regulations for Ladakh:

What are these regulations?

- The Union Government, under Article 240 of the Constitution, which empowers the President to frame regulations for Union Territories without legislatures, has introduced a set of executive rules tailored to Ladakh's unique socio-cultural context.

Summary of Key Regulations:

- Ladakh Civil Services Decentralization and Recruitment (Amendment) Regulation, 2025:
- Introduces domicile-based job reservations in government employment.

- Domicile defined as residents of 15 years, students with 7 years of schooling and local exams, and children of long-term Central Government employees.

Ladakh Civil Services Domicile Certificate Rules, 2025:

- Details procedure for domicile certificate issuance, including physical and online application modes.
- Tehsildar as issuing authority; Deputy Commissioner as appellate authority.

Union Territory of Ladakh Reservation (Amendment) Regulation, 2025:

- Increases caste-based reservation in public employment and professional institutions (e.g., medical, engineering) to 85%, excluding 10% for Economically Weaker Sections (EWS).

Ladakh Official Languages Regulation, 2025:

- Recognises English, Hindi, Urdu, Bhoti, and Purgi as official languages.
- Promotes Shina, Brokskat, Balti, and Ladakhi to preserve linguistic and tribal heritage.

Ladakh Autonomous Hill Development Councils (Amendment) Regulation, 2025:

- Reserves one-third of LAHDC seats for women, using a rotational system.

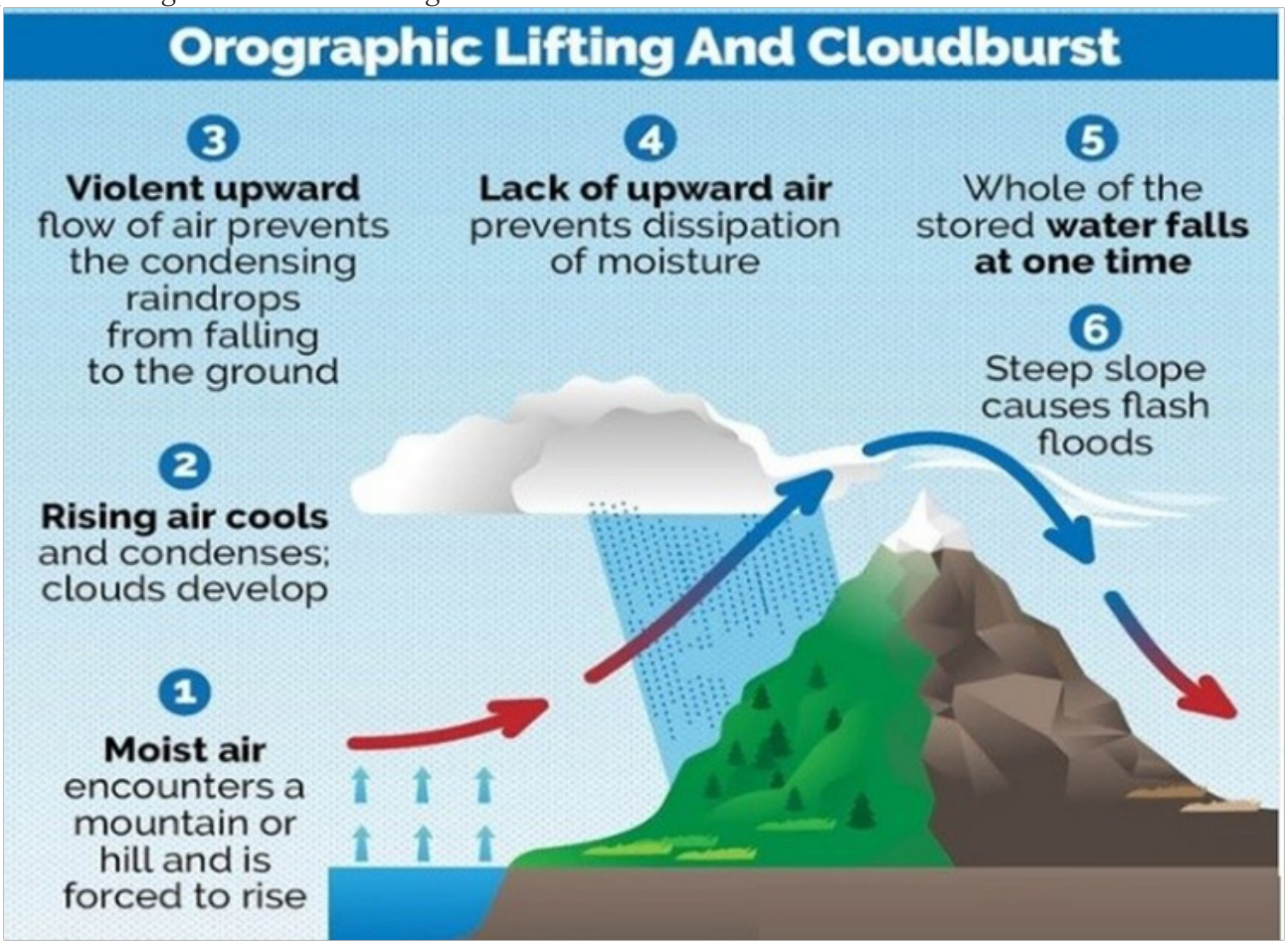
Significance of the New Legal Framework:

- First Indigenous Legal Architecture: These are the first region-specific laws post-bifurcation, distinct from borrowed J&K regulations.
- Protects Local Interests: Domicile clause in jobs and language recognition meet core public demands.
- Empowers Women: Political participation of women institutionalised through reservation in hill development councils.
- Cultural Inclusion: Recognition of tribal dialects addresses identity and heritage concerns in a plural society.

Cloudburst

Context:

Cloudbursts in Kangra and Kullu districts of Himachal Pradesh triggered devastating flash floods, killing two people and leaving over a dozen missing.



About Cloudburst:

What is a Cloudburst?

- A cloudburst is a sudden, highly intense rainfall event, releasing ≥100 mm of rain in under one hour over a localized area (~10 km^2).
- These events often occur over hilly or mountainous regions, triggering flash floods, landslides, and infrastructural damage.

Conditions Favoring Cloudbursts:

- Orographic lifting: Moist winds rise rapidly due to steep mountainous terrain, forming large cumulonimbus clouds.
- Strong convection currents: Fast vertical motion of air (60–120 km/h) forms deep vertical clouds, storing vast water content.
- Localized convergence zones: Wind patterns trap moisture in narrow valleys, increasing precipitation density.
- High latent heat release: Warm air holds more moisture—7% more per 1°C rise (Clausius-Clapeyron law)—intensifying rainfall rates.

How Cloudbursts Occur?

- Moist air from monsoon winds hits the windward slope of mountains (e.g., Himalayas).
- This causes adiabatic cooling and condensation, forming towering cumulonimbus clouds up to 15–21 km high.
- Under unstable atmospheric conditions, rapid cloud formation overwhelms the area's drainage capacity.
- The result is intense downpours over small regions, sometimes exceeding 2 billion litres/hour over 20 km^2, causing flash flooding and debris flows.

Consequences of Cloudbursts:

On Other Disasters:

- Flash Floods: Sudden water surge inundates settlements (e.g., Manikaran 2025).
- Landslides: Rain-saturated slopes collapse (e.g., Chokhang–Nainghar road, Lahaul 2025).
- Infrastructure Damage: Bridges and roads washed away (e.g., Baladhi Bridge, 2025).

On People:

- Loss of life & displacement: Sudden impact leaves little evacuation time (e.g., 15 workers missing in Kangra).
- Livelihood impact: Damage to hydropower, tourism, and agriculture leads to long-term setbacks.
- Access issues: Entire villages (e.g., Jasrath, Manikaran) cut off due to washed bridges.

On Environment

- Soil erosion and riverbank destabilization affect biodiversity and river ecosystems.
- Sediment load increases in rivers, affecting aquatic habitats and downstream dams.
- Waste dispersion from urban areas into rivers degrades water quality.

Measures to Manage Cloudburst Risks:

1. National Disaster Management Authority (NDMA) Guidelines:

- Released specific Cloudburst Management Guidelines (2010) focusing on early warning systems, risk zoning, and community awareness.
- Emphasis on preparedness, response coordination, and structural resilience in vulnerable areas.

2. Technological Upgrades:

- Doppler Weather Radars: Installed in select regions for nowcasting (<3 hours alert).
- Automatic Rain Gauges: Help identify high-risk zones for cloudburst-prone mapping.
- Weather Modelling: IMD uses numerical models for heavy rain alerts, though cloudburst prediction remains limited.

3. Local Capacity Building:

- Panchayats and DM offices instructed to share emergency numbers, monitor hillsides, and halt dam water release if risk arises (HP advisory, June 2025).
- Evacuation drills and awareness campaigns in hill villages before monsoon onset.

4. Climate Action:

- IPCC warns of increased extreme weather with warming: a 1°C rise causes 7–10% more rainfall
- Need for mitigation of emissions and resilient urban planning in hill cities.

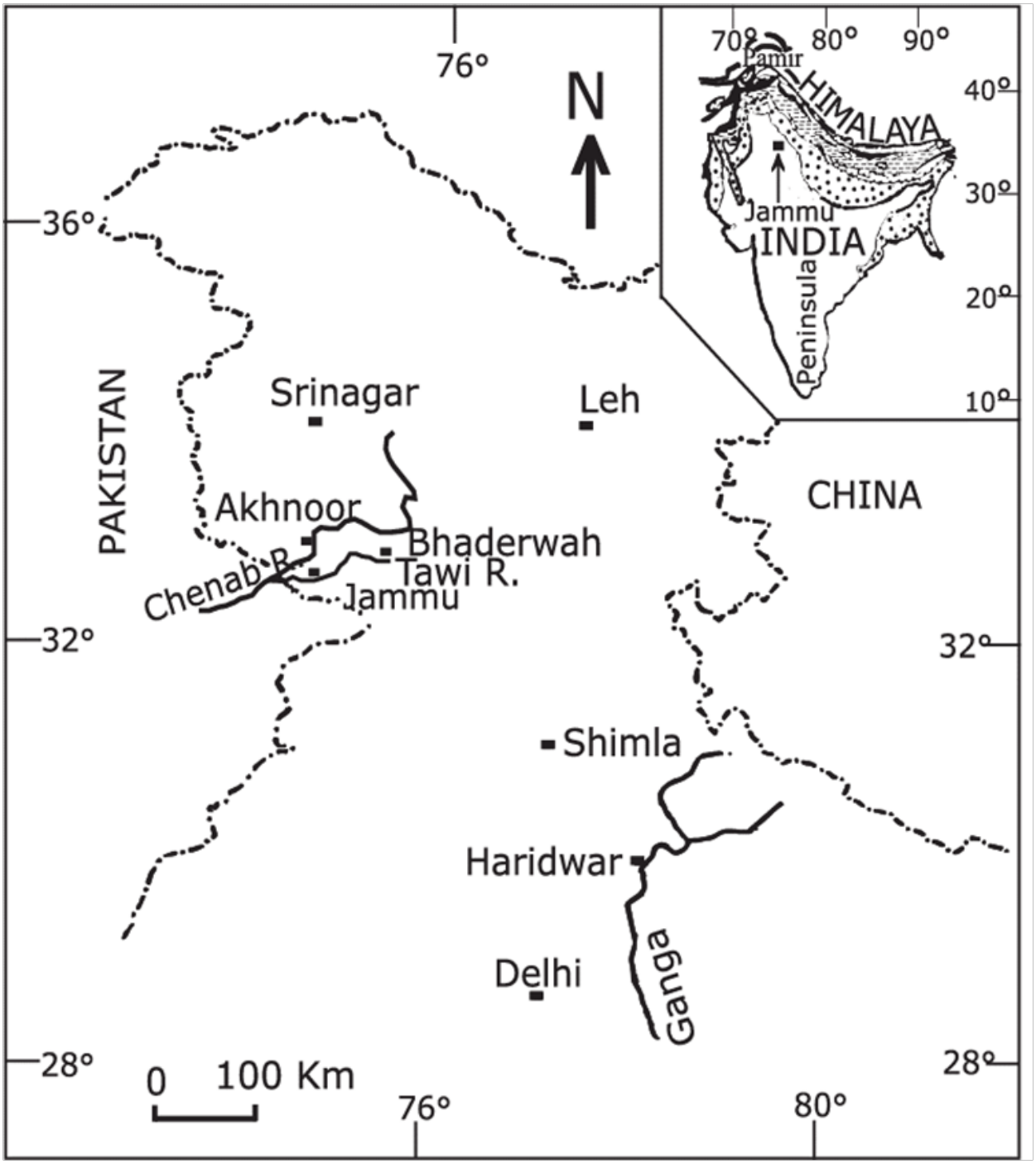
Conclusion:

Cloudbursts are becoming increasingly destructive, especially in ecologically fragile Himalayan regions, due to a combination of intense rainfall and poor forecasting infrastructure. A multi-pronged, tech-enabled approach must be prioritized to safeguard lives, livelihoods, and ecosystems.

Tawi River

Context:

Nine individuals, including pilgrims and labourers, were rescued from the Tawi River in Jammu after a sudden flash flood caused by heavy rainfall.



About Tawi River:

Origin:

- The Tawi River flows through Jammu region of Jammu and Kashmir and later enters Pakistan-administered territory.
- It originates from the Kailash Kund glacier (Kali Kund) near Bhaderwah in Doda district.

States/Regions It Flows Through:

- Primarily flows through Doda, Udhampur, and Jammu districts.
- Crosses into Pakistan's Punjab, eventually joining the Chenab River.
- Tributary Status: Tawi is a left-bank tributary of the Chenab River, a key river in the Indus River System.

Key Features:

- Length: 141 km.
- Catchment area: 2168 km^2 up to the Indian border.
- Major tributaries include Raji, Gou Karan, and seasonal streams supporting perennial flow.

Significance:

- Lifeline of Jammu: Main source of water for the city.
- Religious Importance: Revered as Surya Putri (Daughter of the Sun God) in Hindu texts like Vishnudharmottara Purana.
- Linked to local legends of Raja Pehar Devta who brought the river to cure his father.
- Supported forts like Bahu Fort and temples, earning Jammu the title "City of Temples".

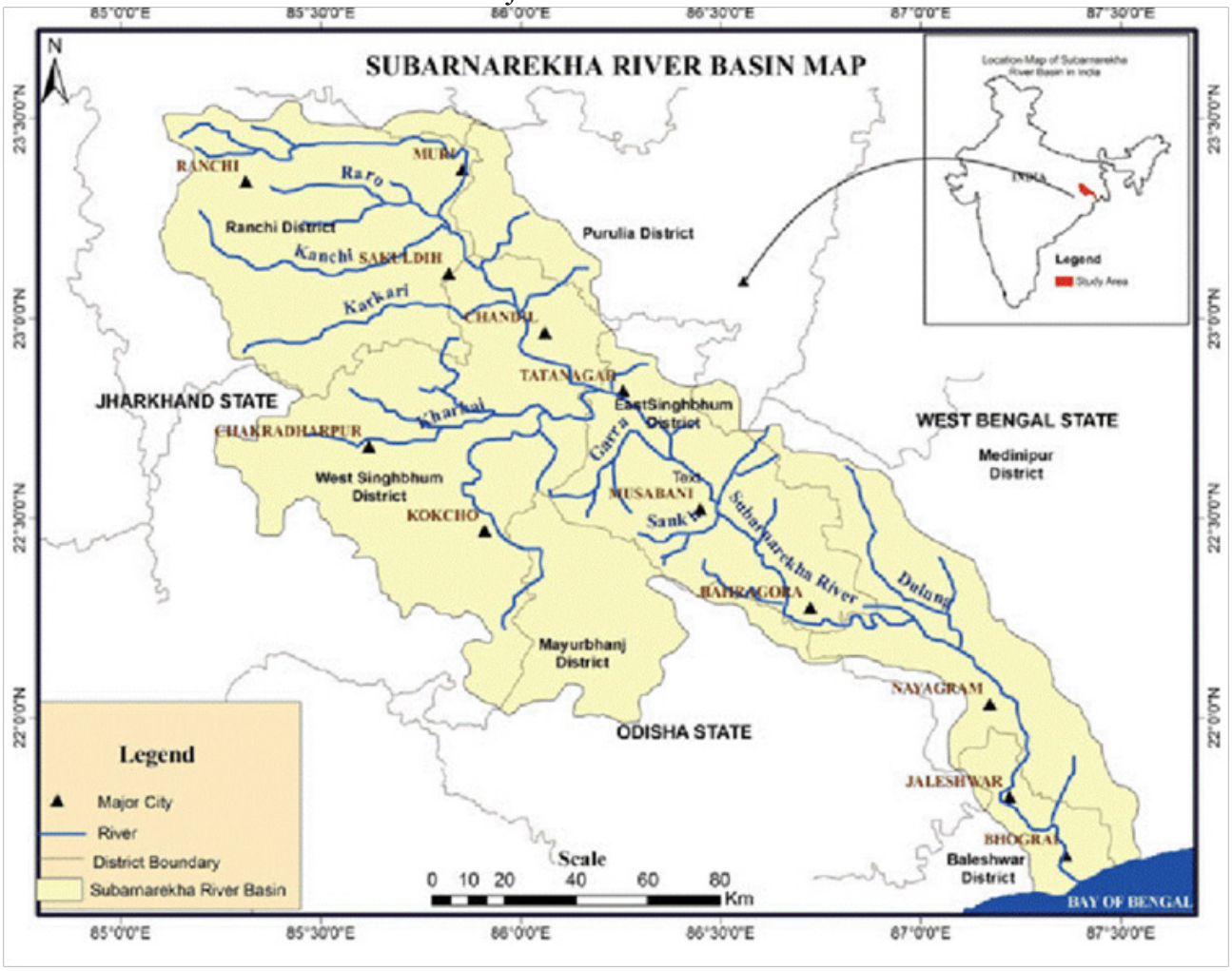
Development Projects:

- The government is constructing an artificial lake at Bhagwati Nagar to boost tourism and water supply.
- Project is under observation to comply with the Indus Water Treaty.

Subarnarekha River

Context:

Over 50,000 people were affected in Balasore, Odisha, after a flash flood in the Subarnarekha River caused by heavy rain and release of water from Chandil Dam in Jharkhand.



About Subarnarekha River:

Origin of River:

- The river originates near Piska/Nagri, close to Ranchi, Jharkhand.
- The name 'Subarnarekha' means "Streak of Gold," linked to historical gold mining at its origin.
- States it flows through: Jharkhand, West Bengal, and Odisha.

Tributaries of Subarnarekha:

- Kharkai (joins at Jamshedpur), Kanchi, Roro, Harmu Nadi, Dulunga, Karru, Karakari, Singaduba, Kodia, and Dhamra.
- It is an independent river system and not a tributary of any larger river.

- Mouth of River: The river empties into the Bay of Bengal near Talsari, Odisha.

Features of River:

- Length: 395 km.
- Drainage area: 18,951 sq. km — smaller among multi-state Indian river basins.
- Hundru Falls: A famous waterfall on its course in Jharkhand — falls from 98 metres.
- Course: After originating in Jharkhand, the river traverses Paschim Medinipur (West Bengal) and Balasore (Odisha) before reaching the sea.
- Cultural Significance: Known for gold traces in the sands of its riverbed.

About Chandil Dam:

What it is?

- A multi-purpose dam known for tourism and irrigation, built across Subarnarekha River.
- Located in: Chandil, Seraikela Kharsawan district, Jharkhand.
- Located on River: Built on the Subarnarekha River, near its confluence with Karkori River (which originates from Hundru Falls).

Lake Natron

Context:

A recent surge in environmental attention has spotlighted Lake Natron in Tanzania, a hyper-alkaline lake capable of calcifying animals, as climate threats and proposed development projects endanger its fragile ecosystem.

About Lake Natron:

What is Lake Natron?

- Lake Natron is a shallow salt and alkaline lake located in northern Tanzania, bordering Kenya in the Gregory Rift Valley, part of the East African Rift system.

Location & Geography:

- Situated in Ngorongoro District, Arusha Region,
- Lies close to the Kenya-Tanzania border.
- Fed by the Ewaso Ng'iro River from Kenya and mineral-rich hot springs.
- Recognized as a Ramsar wetland site of international importance.

Unique Features of Lake Natron:

Extremely Alkaline Waters:

- pH levels can reach 5–12, nearly as corrosive as ammonia.
- Alkalinity results from sodium carbonate and trona deposits, originating from Ol Doinyo Lengai volcano, the world's only active carbonatite volcano.

Calcification of Animals:

- High salt and soda concentrations dehydrate and preserve animals that fall into the lake.
- Optical illusions from the glassy surface cause birds to crash, leading to their calcification.
- Striking Red Color: Caused by halophilic microorganisms that thrive in hypersaline water.

Flamingo Habitat:

- Only regular breeding site for Africa's lesser flamingos.
- Flamingos feed on cyanobacteria and nest on isolated soda flats, avoiding predators.

Threats to Lake Natron Ecosystem:

- Climate Change: Increased evaporation and erratic rainfall patterns (only 800 mm/year).
- Development Projects: Industrial plans may disrupt flamingo breeding and increase pollution.
- Agricultural Runoff & Pollution: Affects water chemistry and ecosystem stability.
- Lack of Protection: Despite Ramsar status, enforcement remains weak.

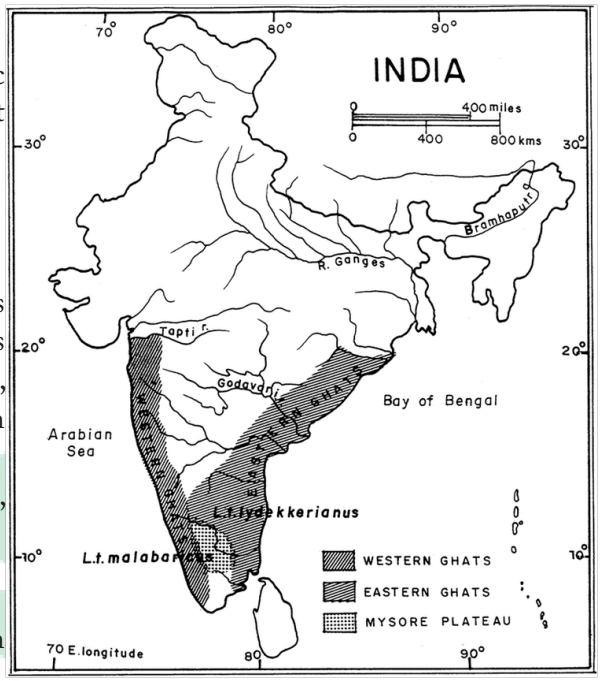
Chapter-
4

ENVIRONMENT

Western Ghats Conservation

Context:

Ecologist Madhav Gadgil has urged for a community-centric approach to conserve the Western Ghats, citing failure of forest bureaucracy and neglect of Forest Rights Act implementation.



About Western Ghats Conservation:

What is It?

- A UNESCO World Heritage Site and one of the world's eight hottest hotspots of biodiversity, the Western Ghats stretch along the western edge of the Deccan Plateau, influencing monsoon systems and sustaining rich ecosystems.
- States Involved: Spread across Gujarat, Maharashtra, Goa, Karnataka, Kerala, and Tamil Nadu.

Key Features:

- Rich Biodiversity: Hosts over 7,400 species, with high endemism in flora and fauna.
- Hydrological Role: Origin of rivers like Godavari, Krishna, and Kaveri, critical for peninsular water security.
- Climatic Influence: Traps monsoon winds, creating high rainfall zones and acting as a climate regulator.
- Topographical Diversity: Composed of lateritic plateaus, escarpments, valleys, and peaks like Anai Mudi (2,695 m).

Formation of Western Ghats:

1. Precambrian Origin:

- The Western Ghats are part of the Peninsular Shield (Deccan Plateau), dating back to the Precambrian Era (>600 million years ago).
- Formed through cratonic uplift and volcanic activity, not orogenic (folding) processes like the Himalayas.

2. Deccan Traps Volcanism:

- The plateau's uplift and the massive basaltic lava flows during the Deccan Trap eruption led to step-like highlands across western India.
- The Ghats are the western edge of this trap topography (trap = stair-step in Swedish).

3. Faulting and Escarpment Formation:

- As India drifted northward after breaking from Gondwana (~100 million years ago), the western edge of the Deccan Plateau fractured and subsided, forming an escarpment (steep slope).
- The Arabian Sea coast subsided, and the land adjacent to it (the Ghats) remained uplifted, forming a rugged edge.

4. Erosional and Fluvial Processes:

- Over millions of years, erosion by monsoon-fed rivers carved deep valleys and dissected the mountain range.
- Today's terrain shows residual plateaus, lateritic caps, and canyon-like valleys.

Issues Plaguing the Western Ghats:

1. Flawed Forest Governance: Forest Department uses outdated and inflated data, limiting transparency and ecological planning.

E.g. Gadgil's 1975 study in Uttara Kannada revealed 10x overestimated bamboo stocks used to justify a paper mill.

1. Industrial Pollution & Misuse of Resources: Polluting industries operate in ecologically fragile zones, backed by state support and no accountability.

   E.g. Grasim Rayon Factory discharged toxic mercury into Chaliyar River, destroying fisheries and tribal livelihoods.

1. Non-Implementation of Forest Rights Act (FRA), 2006: Tribal and forest-dependent communities continue to be denied Community Forest Rights (CFR) despite legal entitlements.

   E.g. In most districts of Kerala and Karnataka, CFR claims remain pending, causing disenfranchisement.

1. Monoculture Plantations & Pesticide Use: Forest lands are diverted for eucalyptus and acacia plantations, harming native biodiversity and soil health.

   E.g. Wayanad experienced decline in pollinators and soil microbes due to pesticide-intensive plantations.

1. Ecologically Harmful Fire Practices: Communities light fires to collect tendu leaves, degrading forest cover and threatening wildlife habitats.

   E.g. Forest fires in Gadchiroli and parts of Karnataka have escalated due to unsustainable collection methods.

1. Inaccessible, Aggregated Forest Data: Forest Survey of India provides delayed and district-level data, hiding local forest degradation.

   E.g. In the 1970s, NRSC satellite imagery showed forest cover at 15%, while FD falsely claimed 23%.

Committees on Western Ghats Conservation:

1. Western Ghats Ecology Expert Panel (WGEEP), 2011

- Led by Madhav Gadgil, recommended ESA zoning, CFR implementation, and Gram Sabha-led conservation.

2. Kasturirangan Committee, 2013

- Favoured a development-friendly approach, reducing ESA coverage and diluting people's participation in governance.

Way Ahead:

1. Implement Community Forest Rights (CFR) under FRA, 2006: Recognizing CFR empowers communities economically and ecologically by giving them ownership and responsibility.

   E.g. Pachgaon, Maharashtra earns income from bamboo, avoids forest fires, and has restored sacred groves.

1. Promote Democratic Decentralisation: Empowering Gram Sabhas ensures local knowledge and accountability in forest conservation.

   E.g. Kerala's VSS model (Vana Samrakshana Samiti) enables community-led forest protection and revenue sharing.

1. Modernise Ecological Data Systems: Use real-time open-access satellite tools like Google Earth or Bhuvan for monitoring forest health and changes.

   E.g. Global Forest Watch now provides 30m resolution data that can be used to counter false FSI claims.

1. Ban Unsustainable Industrial Activities in ESA: Enforce SC-mandated mining bans in wildlife corridors and fragile ecosystems to avoid irreversible biodiversity loss.

   E.g. Mining in Goa and Kerala hill tracts led to habitat fragmentation and water table depletion.

1. Promote Biodiversity-Compatible Livelihoods: Encourage NTFP-based enterprises, eco-tourism, and agro-forestry to align income generation with conservation.

   E.g. Wayanad tribal co-operatives market organic turmeric and wild honey internationally.

Conclusion:

The Western Ghats are vital for India's ecological stability, water security, and cultural heritage. Conservation cannot succeed without empowering its long-standing forest communities. Democratic, data-driven, and ecologically just governance is the only way forward.

Sariska Tiger Reserve

Context:

The Central Government's plan to redraw the boundaries of Sariska Tiger Reserve in Rajasthan to reopen 50 closed mines has triggered strong opposition.

- The plan proposes to redraw boundaries to allow 50 mines (marble, dolomite, limestone, and masonic stone) to reopen.

About Sariska Tiger Reserve:

- Location: Located in Alwar district, Rajasthan, nestled in the Aravalli Hills.

History and Status:

- Declared a wildlife sanctuary in 1958, a tiger reserve in 1978 under Project Tiger, and a national park in 1982.
- Known for being the first reserve in the world to successfully relocate tigers after local extinction in 2004.

Features of the Tiger Reserve:

- Total area: 1203.34 km^2 (Core: 881 km^2, Buffer: 322.23 km^2).
- Terrain: Scrub-thorn arid forests, dry deciduous forests, grasslands, rocky hills.
- Fauna: Tigers, leopards, nilgai, sambhar, chital, peafowls, serpent eagles, vultures, and horned owls.
- Ecological Zone: Khathiar-Gir dry deciduous forest ecoregion.
- Vital link in the Northern Aravalli Leopard and Wildlife Corridor.

Tiger Revival Timeline:

- 2004: No tigers left due to poaching.
- 2008–2010: Tiger relocation from Ranthambore via aerial translocation.
- 2025: Tiger count has risen to 48, showcasing successful conservation efforts.

Dhole (Asiatic Wild Dog)

Context:

A recent study by the Wildlife Institute of India (WII) confirmed the reappearance of the dhole (Asiatic wild dog) in the Kaziranga-Karbi Anglong Landscape, marking its return after being considered locally extinct.

About Dhole (Cuon alpinus):

- Species Profile: The dhole is a social carnivore, also known as the Asiatic wild dog, and is classified as Endangered by the IUCN.
- Habitat: Prefers dense forests, scrublands, and mountainous terrains; requires large, undisturbed habitats with high prey density.
- Distribution: Found in South, Central, and Southeast Asia. In India, populations exist in the Western Ghats, Eastern Ghats, central India, and parts of the northeast.

Key Features:

- Rusty-red coat with a bushy black-tipped tail.
- Packs are matriarchal, highly coordinated hunters.
- Plays a vital role in maintaining prey population balance in forest ecosystems.

About Kaziranga–Karbi Anglong Landscape (KKAL):

- Location & Extent: Spreads over 25,000 km² in Assam, touching parts of Meghalaya and Nagaland and lies south of the Brahmaputra River.
- Protected Areas Network: Includes Kaziranga National Park, Karbi Anglong, and linkages to Pakke, Nameri, Laokhowa–Burhachapori, Nambor, and Ntanki protected areas.

Flora & Fauna:

- Home to tropical semi-evergreen forests, grasslands, and marshy wetlands.
- Rich biodiversity: one-horned rhinoceros, Bengal tiger, Asian elephant, leopard, sloth bear, and over 500 bird species.

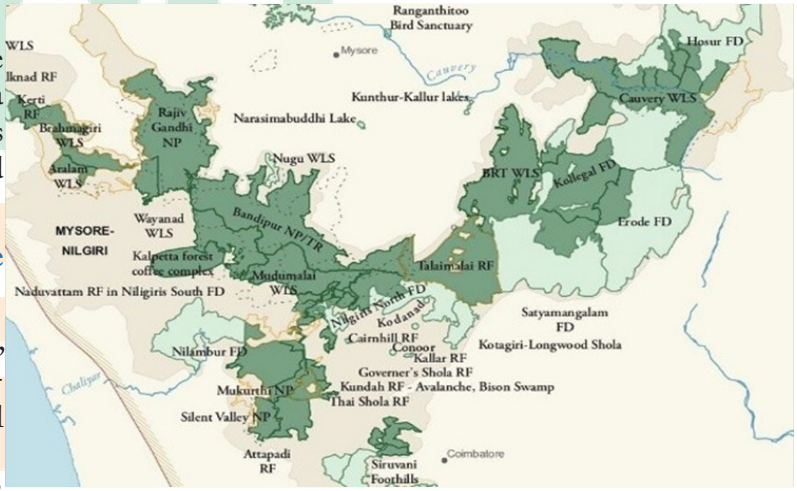
Ecological Significance:

- Acts as a genetic and movement corridor for megafauna.
- One of the last large continuous forest patches in northeast India.
- Plays a key role in long-term species survival in a fragmented landscape.

Male Mahadeshwara Hills Wildlife Sanctuary

Context:

Five tigers — a mother and four cubs — were found dead in Karnataka's Male Mahadeshwara (MM) Hills Wildlife Sanctuary, raising serious concerns about poisoning, wildlife conflict, and tiger conservation lapses.



About Male Mahadeshwara Hills Wildlife Sanctuary:

- Located in Chamarajanagar district, Karnataka, near the Eastern Ghats tri-junction of Karnataka, Kerala, and Tamil Nadu.
- Declared a Wildlife Sanctuary in 2013 and managed under the MM Hills Wildlife Division, which was formerly the Kollegal Forest Division.

Geography and Ecosystem:

- Covers an area of approximately 906 sq km.

Geographically contiguous with:

- BRT Tiger Reserve
- Sathyamangalam Tiger Reserve
- Cauvery Wildlife Sanctuary
- Terrain comprises hill ranges, undulating valleys, and altitudinal variation, creating microhabitats.
- Flora: Dominated by dry and moist deciduous forests, degrading to scrub at fringes.
- Pockets of semi-evergreen, evergreen, and shola forests at higher altitudes.

Fauna:

Rich megafauna includes:

- Tigers, elephants, leopards, gaur, wild dogs (dhole)
- Herbivores: sambar, barking deer, spotted deer, four-horned antelope
- Omnivores and others: sloth bear, wild boar, honey badger, langurs
- Sanctuary has seen a steady rise in tiger population since 2013.

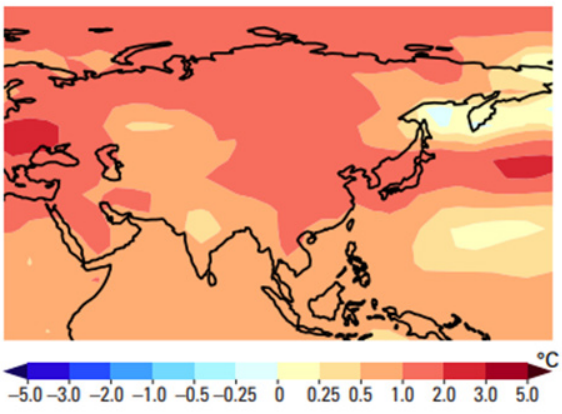
Tiger Reserve Proposal:

- Yet to be notified as a Tiger Reserve, despite ecological suitability.

WMO's State of the Climate in Asia 2024 Report

Context:

India's eastern and western coastal regions are witnessing faster sea level rise than the global average, according to WMO's State of the Climate in Asia 2024 report, posing an increasing threat to livelihoods and infrastructure.



Summary WMO's State of the Climate in Asia 2024 Report:

Key Trends in India:

- Sea Level Rise: Arabian Sea rising at 3.9 ± 0.4 mm/year and Bay of Bengal at 4.0 ± 0.4 mm/year, both surpassing global average of 3.4 mm/year, threatening coastal zones.
- Coastal Impact: Low-lying regions within 50 km of India's coast face increasing submergence risk, endangering livelihoods and urban infrastructure.
- Glacial Retreat: 23 of 24 glaciers in the Central Himalayas are losing mass, accelerating flood risk from glacial lake outburst floods (GLOFs).
- Heatwaves: Over 450 deaths reported in 2024 due to prolonged and extreme heatwaves affecting multiple Indian states.
- Lightning: Lightning incidents claimed 1300 lives in 2024 and a single deadly event killed 72 people across five Indian states on July 10.

Trends in Asia:

- Warming Rate: Asia is heating at twice the global rate, amplifying regional climate impacts like droughts, floods, and storms.
- Heat Records: 2024 marked the second warmest year on record in Asia, with widespread, prolonged heatwaves across several countries.
- Natural Disasters: Increased frequency of landslides and floods, e.g., Kerala's Wayanad landslide (350+ deaths after 500 mm rainfall in 48 hours).
- Glacial Lake Outburst: Glaciers in Himalayas and Tian Shan are melting rapidly, increasing GLOF events and downstream flooding risk.

Factors Influencing Sea Level Rise:

- Thermal Expansion: Rising ocean temperatures cause thermal expansion of water, pushing sea levels higher.
- Melting Ice Sheets: Accelerated melting of Greenland, Antarctic ice sheets, and global glaciers directly contributes to sea level rise.
- GHG Emissions: CO_2 and other greenhouse gases from fossil fuels drive global warming, fuelling further sea level rise.
- Ocean Currents Variability: Changes in regional ocean currents redistribute heat, affecting local patterns of sea level increase.

Consequences:

For India:

- Coastal Erosion: Progressive erosion of coastlines threatens India's eastern and western seaboards, affecting millions of residents.
- Livelihood Risks: Rising seas imperil fishing, agriculture, and tourism-based livelihoods in vulnerable coastal communities.
- Infrastructure Damage: Key ports, industrial hubs, homes, and urban infrastructure risk flooding or permanent damage.
- Migration: Increasing displacement of populations from coastal belts likely, triggering climate-induced migration.

For Asia:

- Island Nations: Countries like the Maldives face existential threats from rising seas and coastal inundation.
- Urban Heat: Asian cities are seeing more frequent heatwaves, stressing public health and urban infrastructure.
- Agricultural Stress: Warming and erratic rainfall lead to crop yield failures, jeopardizing food security.
- Health Hazards: Heat-related illnesses and vector-borne diseases (malaria, dengue) are on the rise due to climate change.

Case Study: Nepal

- Nepal's glaciers in Central Himalayas lost significant mass in 2024, heightening flood risks.
- Increased GLOFs are threatening hydropower stations, roads, and mountain communities with devastating floods.

Recommended Measures:

- Coastal Zone Management: Develop resilient coastal infrastructure and restore mangroves to buffer sea level rise.
- Emission Reductions: Accelerate NDC targets and implement net-zero emissions pathways to mitigate warming.
- Early Warning Systems: Invest in climate monitoring, forecasting, and disaster early warning mechanisms.
- International Cooperation: Strengthen regional partnerships through UNFCCC and related climate adaptation frameworks.
- Local Capacity Building: Train communities in adaptive techniques and build local resilience to climate risks.

Conclusion:

The WMO's State of the Climate in Asia 2024 underscores the urgent climate threat to India's coasts. Policymakers must integrate robust mitigation and adaptation strategies to safeguard lives, livelihoods, and ecosystems.

UNEP launched the NDC Cooling Guidelines 2025

Context:

The UNEP launched the NDC Cooling Guidelines 2025 to help countries integrate sustainable cooling into Nationally Determined Contributions (NDCs), addressing rising emissions and heat-related vulnerabilities.

About UNEP launched the NDC Cooling Guidelines 2025:

What it is?

- A global framework offering countries a structured process to include cooling measures in climate plans (NDCs) to balance mitigation, adaptation, and development goals.
- Developed by: UNEP Cool Coalition NDC Working Group with partners like UNDP.

Objectives:

- Integrate sustainable cooling in NDCs.
- Cut sector emissions by 60% by 2050.
- Improve access to life-saving cooling for 1.1 billion people.
- Strengthen MRV (Monitoring, Reporting, Verification) for cooling measures.
- Align with Kigali Amendment and Global Cooling Pledge.

Data & Stats from the Report:

- Cooling = 7% of global GHG emissions today and could exceed 10% by 2050.
- 1.1 billion people lack access to cooling, risking lives, food security, and health.
- Cooling uses 20% of building electricity worldwide and over 50% in UAE buildings.
- By doubling appliance efficiency, cooling access can grow 6 times without proportional rise in emissions.

Key Challenges to Cooling Worldwide:

1. High Emissions: Without urgent interventions, cooling-related emissions could double by 2050, exacerbating climate change and energy demand.

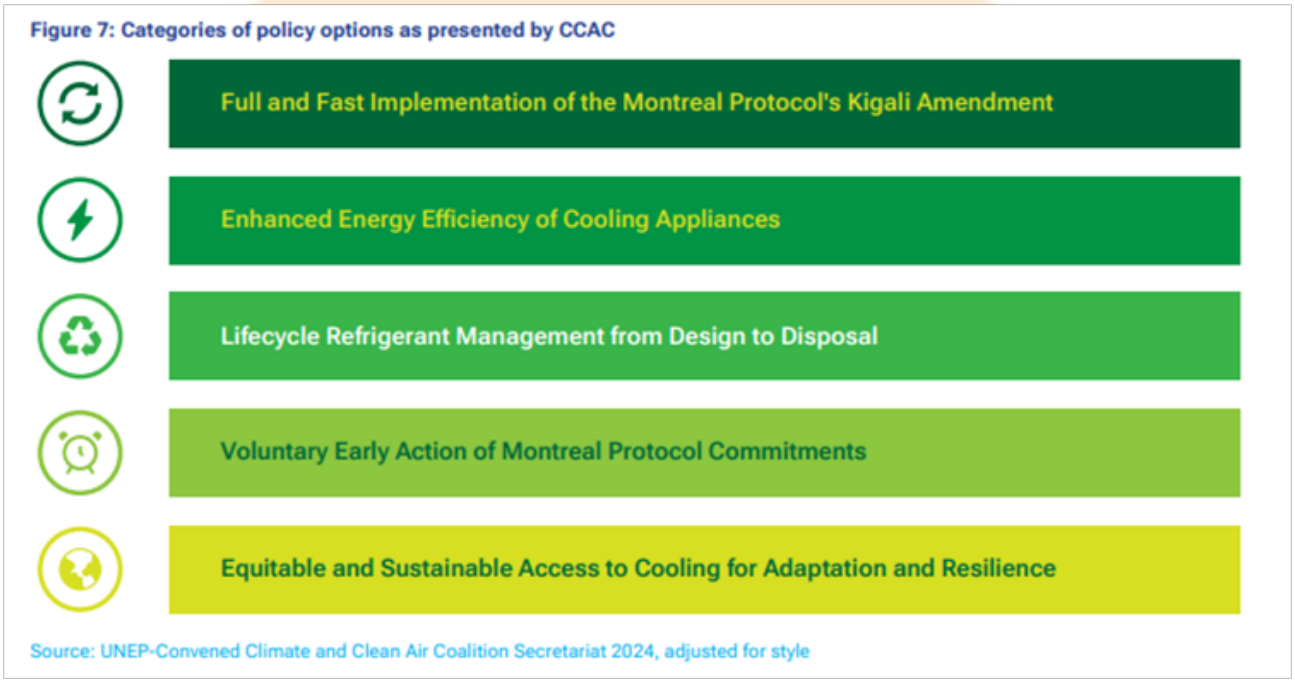
2. Access Gaps: Over 1.1 billion people globally lack affordable access to sustainable cooling, putting lives, food security, and healthcare at risk.
3. Vicious Cooling Cycle: Rising heat drives demand for inefficient cooling, which increases emissions — a self-reinforcing "vicious cycle" of climate impacts.
4. Policy Gaps: Only 27% of updated NDCs include concrete energy efficiency targets for cooling, revealing gaps in national climate planning.
5. Gender Inequity: Women, particularly in rural and low-income settings, face higher health risks from inadequate cooling and extreme heat.

UNEP Cooling Guidelines Summary:

Six-Stage Action Framework

1. Baseline Definition: Countries must assess current HFC emissions and energy use in the cooling sector to identify priority actions.
2. Target Formulation: Set measurable, time-bound cooling targets aligned with their NDCs to guide policy and investment.
3. MRV Systems: Develop robust Monitoring, Reporting, and Verification (MRV) tools to transparently track progress and outcomes.
4. Policy Actions: Adopt Minimum Energy Performance Standards (MEPS), Kigali-compliant refrigerant phase-down, urban greening, and passive cooling.
5. Governance: Create cross-ministerial, gender-responsive coordination mechanisms for effective cooling policy implementation.
6. Finance & Access: Mobilise finance and prioritise policies to ensure equitable access to affordable, sustainable cooling technologies.

Figure 7: Categories of policy options as presented by CCAC



Source: UNEP-Convened Climate and Clean Air Coalition Secretariat 2024, adjusted for style

Country Examples:

- Nigeria: Integrated National Cooling Action Plan (NCAP) into NDCs with focus on heat-resilient rural infrastructure.
- UAE: Prioritised district cooling systems and highly energy-efficient ACs in NDC 3.0 roadmap.
- Grenada: Committed to becoming the world's first HFC-free nation by targeting complete phase-down

Conclusion:

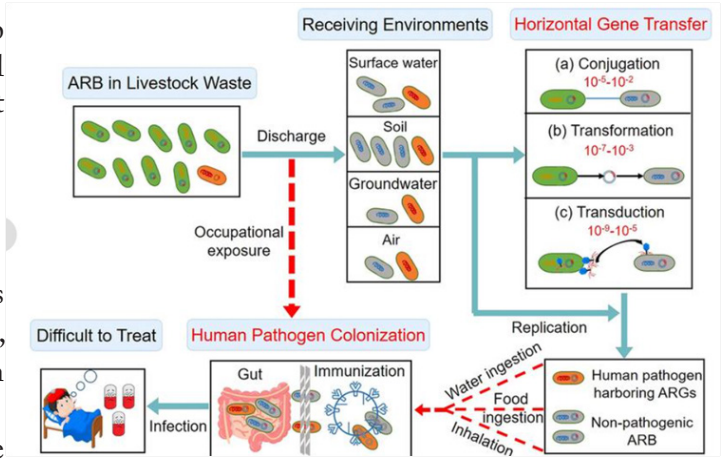
The UNEP NDC Cooling Guidelines empower nations to transform cooling from a growing climate risk into an opportunity for equitable low-carbon growth. Integrating sustainable cooling in NDCs ensures climate resilience,

human well-being, and progress towards SDGs. This is vital for India and global South nations facing extreme heat challenges.

Insect-Based Livestock Feed

Context:

Indian researchers and ICAR institutes are scaling up insect-based livestock feed to combat antimicrobial resistance (AMR) and lower the environmental impact of conventional animal farming.



About Insect-Based Livestock Feed:

What it is?

- Feed prepared from nutritious insect species such as black soldier flies, crickets, mealworms, and grasshoppers, used as a sustainable protein source for livestock and aquaculture.
- Developed by: Pioneered by ICAR and private partners like Ultra Nutri India, Loopworm, and Bhairav Renderers in collaboration with institutes such as CIBA and CMFRI.

Principle behind working:

- Waste-to-protein bioconversion: Insects like black soldier fly larvae efficiently consume and metabolize organic residues (agro-waste, food waste, brewery waste), producing high-protein biomass suitable for animal feed.
- Rapid biomass accumulation: Larvae grow rapidly (within 12–15 days), accumulating up to 75% crude protein and essential lipids, making the conversion process time-efficient and cost-effective.
- Enhanced gut microbiota modulation: Insect-derived proteins enhance animal gut health by promoting beneficial microbiota and reducing dependency on antibiotic growth promoters—thus helping mitigate AMR.
- Closed-loop nutrient cycling: Residual frass (insect waste) can be used as organic fertilizer, creating a circular, low-waste production model that supports sustainable agriculture.

Key Features:

- High nutritional value: Rich in proteins (up to 75%), fats, micronutrients (zinc, iron, calcium), and dietary fibre.
- Efficient resource use: Insects require less land, water, and feed compared to traditional livestock farming.
- Low environmental footprint: Emissions of greenhouse gases are significantly lower in insect farming.
- Waste valorization: Insects upcycle organic and food waste into usable animal feed.
- Economic viability: Lower cost of production with better protein digestibility than soy or fish-based feed.

Significance:

- Fights AMR: Reduces the need for antibiotics in feed, helping tackle antimicrobial resistance at the source.
- Supports food security: Can help meet rising protein demands as global food production must grow 70% by 2050 (FAO).
- Enhances climate resilience: Aligns with climate-smart agriculture and helps reduce the environmental impact of animal farming.
- Global momentum: Already regulated in 40 countries for animal feed use, including species like black soldier flies and crickets.
- Indian initiatives: ICAR-led projects aim to scale insect-based feed for shrimp, seabass, poultry, and livestock.

Green India Mission

Context:

The Union Government released a revised roadmap for the Green India Mission, aiming to enhance forest restoration, combat climate change, and address land degradation and desertification challenges.

About Green India Mission:

What it is?

- GIM is a key mission under NAPCC to enhance forest cover, restore degraded lands, and contribute to India's climate goals.

Launched in: 2014

- Ministry: Ministry of Environment, Forest and Climate Change (MoEF&CC)

Objective:

- Increase forest/tree cover by 5 mha and improve forest quality on another 5 mha.
- Sequester 2.5-3 billion tonnes of CO2 by 2030.
- Restore degraded ecosystems and enhance biodiversity.
- Combat land degradation and desertification.
- Improve livelihoods of forest-dependent communities.

Key Features:

- Ecosystem Restoration: Restores degraded forests, grasslands, wetlands, and mangroves.
- Carbon Sink Creation: Aligns with India's NDC target to create additional 2.5-3 billion tonnes CO2 sink.
- Community Participation: Focuses on livelihood enhancement of forest-fringe communities.
- Science-Based Planning: Uses FSI data and ecological mapping for priority restoration zones.
- Multi-Sectoral Convergence: Leverages synergies with other schemes like Green Wall Project, CAMPA funds.

New Changes in GIM 2025:

- Regional Focus: Special priority to Aravallis, Western Ghats, Himalayas, mangroves.
- Green Wall Project: Linked with Aravalli Green Wall to control desertification/dust pollution.
- Mining Rehabilitation: Focus on eco-restoration of abandoned mining areas.
- Open Forests: Priority to restore open forests — estimated 1.89 billion tonnes CO2 potential.
- Updated Targets: Alignment with India's 26 mha land restoration commitment by 2030.

Gharial Conservation Programme

Context:

Etawah marked the 50th anniversary of its gharial conservation initiative on World Crocodile Day (June 17), celebrating five decades of protecting this ancient species along the Chambal River.

About Gharial Conservation Programme:

What is it?

- A pioneering project aimed at conserving India's endangered gharial (Gavialis gangeticus), using captive breeding and 'rear-and-release' methods to boost wild populations.

Launched in: 1975

- Supported by: UNDP, FAO, Government of India
- State: Uttar Pradesh (Etawah district, Chambal River region)
- Launched By: Forest Department of Uttar Pradesh and Society for Conservation of Nature (SCON).

Habitat:

- Primary Habitat: Chambal River (Uttar Pradesh)
- Ideal Conditions: Pristine, deep river stretches with minimal human disturbance
- Breeding Centre: Kukrail Gharial Rehabilitation Centre, Lucknow

Objectives:

- Protect remaining gharial populations in natural habitats.
- Enhance population through captive breeding and staged release.
- Build awareness among local communities and involve them in conservation.
- Study habitat biology and gharial behaviour for scientific management.
- Develop sustainable coexistence with local fishing communities.

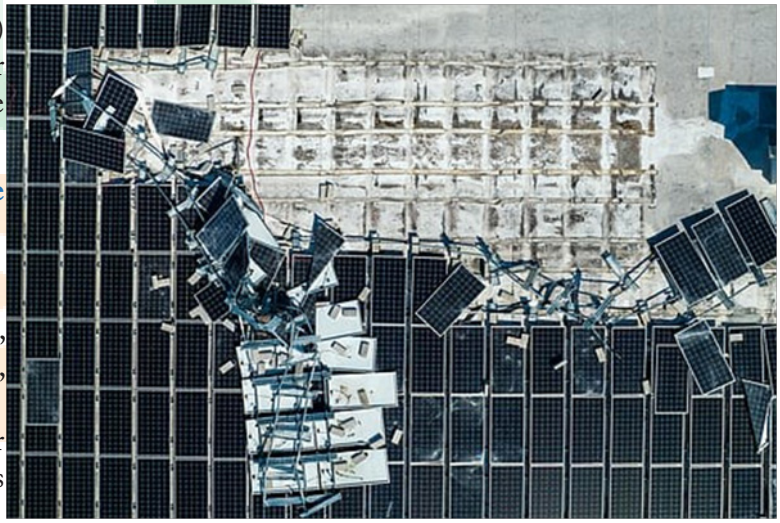
Key Features:

- Egg Collection: Eggs gathered from natural nests along the Chambal River.
- Artificial Incubation: Controlled temperature and humidity ensure high hatch rates.
- Captive Rearing: Juveniles raised 3–5 years at Kukrail Centre to improve survival.
- Release Programme: Marked juveniles released in protected river stretches.
- Community Involvement: Fishermen and villagers engaged in conservation-friendly livelihoods.

CPCB Drafts India's First Solar Waste Playbook

Context:

The Central Pollution Control Board (CPCB) released draft guidelines on June 4, 2025, for managing solar photovoltaic (PV) waste under the E-Waste (Management) Rules, 2022.



About CPCB Drafts India's First Solar Waste Playbook:

What is Solar Waste?

Solar waste refers to end-of-life solar PV modules, panels, or cells discarded from use or manufacturing, now classified as CEEW 14 under e-waste rules.
India may generate over 34,600 tonnes of solar waste by 2030 due to accelerated installations across rooftops, floating, and ground-mounted parks.

Legal & Policy Framework: E-Waste Rules, 2022:

- Coverage: Solar waste is governed under Chapter V of the E-Waste (Management) Rules.
- Exemption: Unlike other e-waste, solar panels are exempt from EPR recycling targets till 2034–35.
- Obligations: Producers must register, file annual returns, maintain collection systems, and comply with CPCB SOPs.
- Hazard Classification: Solar waste contains hazardous elements like cadmium, lead, arsenic, gallium, and tellurium.

Issues Surrounding Solar Waste in India:

1. Environmental Risks: Toxic heavy metals may leach into soil/water or release fumes if panels are burnt or dumped.

   E.g. Lead and cadmium are potent groundwater pollutants.

1. Health Hazards: Informal or unsafe handling may cause respiratory, skin, or neurological ailments among workers.
2. Data Deficiency: Lack of granular data on waste quantities, recycling infrastructure, and informal disposal.
3. Lack of Infrastructure: Limited certified recyclers with tech to extract and separate silicon, silver, or polymers.

4. Unregulated Storage: Stacking in open environments increases fire, contamination, and breakage risk.

Implication of Solar Waste:

Implications on People:

1. Health Hazards to Informal Workers: Exposure to toxic elements like lead, cadmium, and arsenic during unregulated dismantling can cause respiratory, skin, and neurological disorders.

   E.g. Informal recycling units in states like Gujarat and Maharashtra lack safety protocols, risking worker health.

1. Community-Level Pollution Exposure: Improper disposal near residential or agricultural areas contaminates local air, soil, and water, impacting livelihoods.

   E.g. Dumping of solar waste in rural dump yards near water bodies raises cancer and birth defect risks.

Implications on Government:

1. Regulatory Burden and Gaps: Absence of dedicated solar waste policy creates legal ambiguity and enforcement challenges under existing e-waste and hazardous waste laws.

   E.g. CPCB's 2025 draft had to fill critical policy gaps due to absence of mandatory EPR targets for solar.

1. Undermining Green Credentials: Mismanagement of solar waste contradicts India's global leadership in clean energy and hinders SDG commitments on sustainable cities and responsible consumption.

   E.g. India risks international scrutiny under UNFCCC and SDG 12 if recycling remains poor.

Implications on Environment:

1. Soil and Groundwater Contamination: Toxic leachates from solar panel metals like selenium and tellurium pollute soil and aquifers when dumped unscientifically.

   E.g. Studies show that cadmium telluride leaching from panels can persist in soil for years.

1. Air Pollution from Burning Panels: Burning polymer back-sheets and soldering metals release hazardous fumes, worsening air quality and ecosystem health.

   E.g. Incineration without filters emits dioxins and furans, known carcinogens under Stockholm Convention.

Solutions and Key Measures from Draft Guidelines:

1. Safe Storage Infrastructure:

- Use covered, ventilated, dry storage areas with impervious, non-leachable floors to avoid soil/water contamination.
- Stack panels only up to 20 layers or 2 metres height.

2. Collection Mechanism & Take-Back:

- Mandatory take-back programmes by producers, with websites, helplines, and pickup logistics.
- Consumer database to facilitate EOL (End-of-Life) recovery.

3. Transportation Standards:

- Use only covered trucks, preferably hazardous waste-compliant vehicles, to move waste to recycling centres.
- Follow the Hazardous Waste Rules, 2016 for final disposal.

4. Labeling & Inventory: All containers must be clearly labelled with solar waste type; periodic inspections and inventories are mandated.
5. Emergency & Fire Safety: Install fire protection systems, ERP protocols, and clear emergency exits in storage zones.
6. Public Participation: CPCB has invited comments till June 25, 2025, ensuring participatory policy formulation.

Conclusion:

India's solar success must be balanced with circular waste practices to maintain sustainability. The CPCB's draft guidelines are a proactive attempt to institutionalise safe, scientific, and inclusive solar waste management. Effective implementation will be key to aligning India's green ambitions with ecological responsibility.

Forest Rights Act Cells

Context:

For the first time since the Forest Rights Act (FRA), 2006, was enacted, the Centre has sanctioned 324 Forest Rights Act (FRA) cells under the Dharti Aba Janjatiya Gram Utkarsh Abhiyaan across 18 States and Union Territories.

About Forest Rights Act Cells:

What It Is?

- District- and State-level units created to support and accelerate the implementation of FRA under the Dharti Aba Janjatiya Gram Utkarsh Abhiyaan (DAJGUA).
- Governing Framework: Established under DAJGUA operational guidelines, not directly under the principal FRA legislation.
- Funded by: The Ministry of Tribal Affairs, Government of India.

Authority & Location:

- Located in Tahsildar/Sub-Division/Collector offices within Tribal Sub-Plan areas.
- Headed by ADM or Sub-Collector at respective levels.

Key Features of FRA Cells:

- Administrative Coverage: 324 district-level cells and 17 State-level cells approved.
- Budget Allocation: 8.67 lakh per district cell; 25.85 lakh per State cell.
- Highest Cells Approved: Madhya Pradesh (55), Chhattisgarh (30), Telangana (29), Maharashtra (26), Assam (25), Jharkhand (24).

Functions of FRA Cells:

- Accelerated Disposal: Expedite pending claims, especially post-District Level Committee (DLC) approval.
- Rejected Claims Review: Re-examine rejected claims and inform claimants with reasons to enable appeal.
- Demarcation Support: Aid in marking boundaries of vested forest lands.
- Title Distribution: Facilitate issuance of land titles and ensure updates in official land records.
- Scheme Integration: Ensure FRA titleholders benefit from government welfare schemes.
- Support CFR Filing: Help Gram Sabhas file claims for Community Rights and Community Forest Resources.
- Revenue Village Conversion: Assist in converting forest settlements into revenue villages legally.
- Stakeholder Coordination: Act as liaison between departments, civil societies, and claimants for smooth implementation.

State and Trends of Carbon Pricing 2025

Context:

The World Bank released its State and Trends of Carbon Pricing 2025 at a time when carbon pricing mechanisms are covering nearly 28% of global GHG emissions and generating over $100 billion in revenue.

About State and Trends of Carbon Pricing 2025:

What is Carbon Pricing?

- Carbon pricing is an economic tool that attaches a cost to the emission of greenhouse gases, incentivizing emission reductions while internalizing climate-related externalities (e.g., floods, health costs).

Types of Carbon Pricing Mechanisms:

Carbon Tax: A fixed price per tonne of CO_2 emissions (e.g., per tonne of fossil fuel carbon content).

- Emissions Trading System (ETS): A cap-and-trade model where emitters buy/sell emission permits under a pre-set limit.

- Carbon Credit/Crediting Mechanism: Tradeable credits are issued for verifiable emission reduction/ removal (e.g., afforestation or methane capture).

Importance of Carbon Pricing:

- Environmental: Reduces GHG emissions by creating economic disincentives.
- Economic: Raises public revenue (over $100 billion globally in 2024).
- Social: Funds adaptation, green jobs, and energy transition in vulnerable sectors.

Trends in Carbon Pricing in 2025:

- Expansion of Instruments: The number of carbon pricing tools has increased from 5 in 2005 to 80 in 2025, comprising 43 carbon taxes and 37 ETSs.
- Coverage Growth: Carbon pricing now covers ~28% of global GHG emissions, up from earlier years.
- Regional Adoption Rising: India, Brazil, and Türkiye are developing domestic carbon pricing frameworks.
- India's ETS Framework: India's upcoming ETS (2024) uses benchmark-based intensity limits rather than a hard emission cap.
- Revenue Mobilization: Globally, carbon pricing generated $100+ billion in public revenues.
- Sectoral Application Hierarchy: Power sector has the highest coverage, followed by industry and aviation, with agriculture and waste largely uncovered.
- Nature-Based Credit Dominance: In Q1–Q3 2024, $14 billion was raised mainly through afforestation and land restoration projects.
- Growth in Engineered Removals: Technologies like Direct Air Capture and Enhanced Rock Weathering are gaining interest.
- Delivery Lag in Engineered Removals: Out of 8 million tons committed, only 318,000 tons of engineered removals were delivered.

Challenges in Carbon Pricing Mechanism:

- Uneven Sectoral Inclusion: Sectors like agriculture and waste are mostly excluded from pricing frameworks.
- Volatility in Voluntary Markets: Voluntary carbon credit markets showed demand fluctuations in 2023, despite climate urgency.
- Delivery Deficit in Removal Projects: There's a major gap between commitments and actual carbon removals delivered.

  E.g. Technologies like DAC are still in early stages and require scaling.
- Data and Monitoring Weaknesses: Developing nations lack strong MRV systems (Monitoring, Reporting, Verification).
- Equity and Social Burden: Carbon costs may indirectly affect poor households through higher fuel or utility prices.

Recommendations:

- Broaden Sector Coverage: Bring agriculture and waste into the pricing framework using context-specific methods.
- Strengthen Monitoring Systems: Use blockchain or satellite verification to improve transparency and credit reliability.
- Stabilize Voluntary Markets: Standardize rules across crediting bodies like Verra and Gold Standard.
- Scale Direct Removals: Public-private partnerships needed for tech-based removals like Direct Air Capture.
- Leverage Revenue for Justice: Reinvest carbon pricing revenues into clean energy subsidies, health care, and vulnerable group protection.

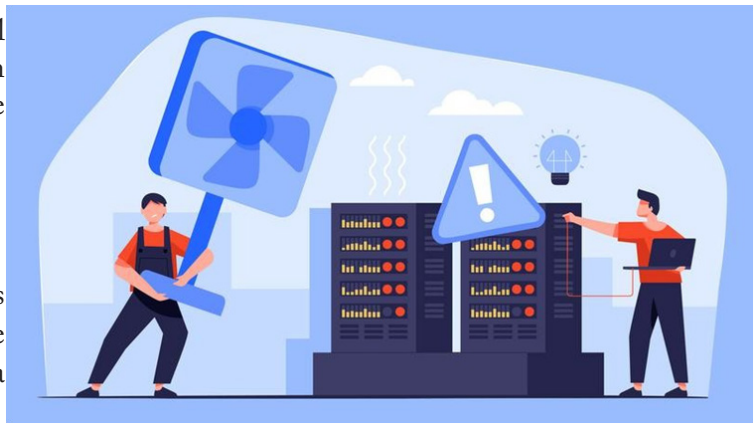
Conclusion:

The 2025 carbon pricing report marks significant global progress but highlights glaring implementation and equity gaps. As climate threats intensify, robust pricing backed by transparent governance and inclusive policies will be key to a just transition.

Technology Industry and Climate Goals

Context:

A landmark study by Microsoft and WSP Global has shown that advanced cooling technologies can significantly reduce emissions, energy, and water use in data centres.



About Technology Industry and Climate Goals:

What it is?

- The tech industry, a major global emitter, is adopting climate-smart practices to reduce its carbon footprint, particularly from data centres and supply chains.

Climate Goals:

- Cut greenhouse gas emissions by 42% by 2030 (from 2015 levels)
- Achieve net-zero emissions by mid-century
- Shift to 100% renewable energy in operations (e.g., Google by 2030)

How the Tech Industry Is Meeting Climate Goals?

- Advanced Cooling Systems: Microsoft's cold plate and immersion cooling tech reduce emissions by 15–21% and water usage by up to 52%.
- Carbon Credits Adoption: Companies like Google and Netflix use verified carbon credits to offset emissions and invest in conservation projects.
- Blockchain in Carbon Markets: Ensures transparency in credit issuance; supported by Gold Standard and used by Indian tech firms for ESG compliance.
- Renewable Energy Integration: Tech giants commit to sourcing 100% renewable power—Amazon, Apple, and Meta already operate some green campuses.
- Indian Tech Industry Leadership: Infosys, Reliance, and Tech Mahindra pioneer sustainable tech via AI, blockchain, and energy-efficient operations.

Challenges Ahead:

- Lifecycle Trade-offs: Cooling tech may reduce emissions but could shift the burden through coolant production impacts.
- High Capital Cost: Green retrofitting of data centres and R&D for emerging tech are expensive and time-intensive.
- Regulatory Bottlenecks: Lack of global standards for coolant fluids and fragmented carbon credit policies hamper scalability.
- Dependence on Grid Power: If the electricity source remains coal-based, tech improvements have limited climate benefits.
- Deployment Lag: Complex design and supply chain issues slow adoption of green cooling systems and renewable transitions.

Way Forward:

- Promote Life Cycle Assessments (LCAs): Encourage all firms to assess environmental trade-offs across the full lifespan of technology solutions.
- Unified Global Framework: Harmonise carbon credit certification and climate disclosures for global tech companies.
- Government Incentives: Offer tax credits, subsidies, and green finance for early adopters of sustainable tech.
- Strengthen R&D in Cooling: Focus on low-impact fluids, scalable designs, and AI-based cooling control systems.
- Public-Private Collaboration: Foster innovation ecosystems where governments, startups, and tech majors co-develop climate solutions.

Conclusion:

The tech sector is at a critical juncture—balancing innovation with climate responsibility. Carbon credits, clean cooling, and renewables are proving pivotal to climate-smart operations. With policy push and tech-led innovation, the industry can steer global sustainability goals.

Jharkhand Has Proposed Its First-Ever Tiger Safari

Context:

Jharkhand has proposed its first-ever tiger safari in the fringe area of Palamau Tiger Reserve (PTR), aimed at boosting tourism and wildlife education.

About Jharkhand Has Proposed Its First-Ever Tiger Safari:

What is a Tiger Safari?

- A tiger safari is a tourism model involving naturalistic enclosures to house tigers — mainly rescued, conflict-prone, or orphaned — allowing guaranteed sightings unlike traditional wild safaris.
- First proposed in NTCA Guidelines 2012, further refined in 2016 and later by Supreme Court directives in 2024.

Legal Framework Governing Safaris:

Governed by:

- Wildlife (Protection) Act, 1972
- NTCA Guidelines (2012, 2016)
- CZA (Central Zoo Authority) for design, welfare, and compliance
- As per SC order (March 2024): Safaris must be outside core and buffer zones of tiger reserves.

Types of Tigers Safaris:

- Captive Safari: Houses rescued or zoo-bred tigers in controlled naturalistic settings.
- Wild Safari: Traditional open-reserve model like in Ranthambore or Jim Corbett, with no guaranteed sightings.

About Palamu Tiger Reserve (PTR):

- Palamu Tiger Reserve is one of the original nine Project Tiger reserves in India, and the only tiger reserve in Jharkhand, notified in 1974.
- Location: Latehar district, on the Chhotanagpur Plateau, Jharkhand.
- Rivers: Drained by North Koel, Burha, and Auranga rivers (Burha is perennial).

Flora:

- Predominantly Northern Tropical Dry Deciduous forests.
- Dominant species: Sal (Shorea robusta).

Fauna:

- Flagship species: Bengal Tiger.
- Other key fauna: Asiatic Elephant, Leopard, Sloth Bear, Grey Wolf, Indian Pangolin, Otter, Four-horned Antelope.

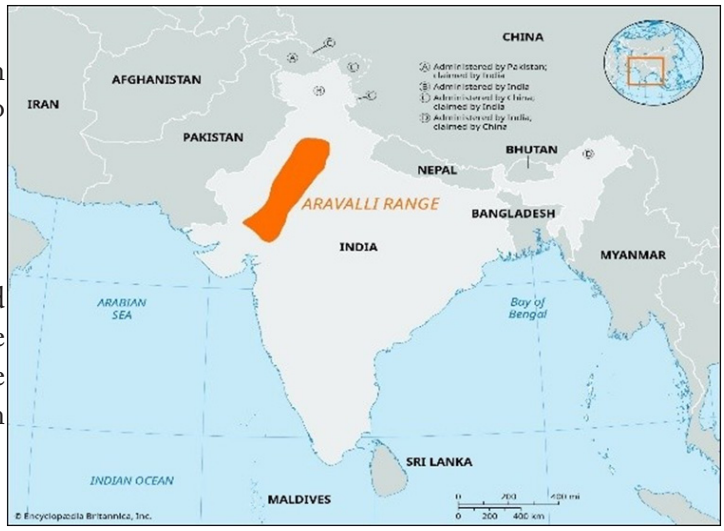
Historical Significance:

- Declared under Project Tiger in 1974.
- Site of the world's first pugmark-based tiger census (1932), led by J.W. Nicholson.

Aravalli Green Wall Initiative

Context:

Prime Minister of India will launch the Aravalli Green Wall initiative on World Environment Day 2025 to rejuvenate the ancient Aravalli range.



About Aravalli Green Wall Initiative:

What is it?

- A centrally coordinated reforestation and landscape restoration campaign led by the Ministry of Environment, Forest and Climate Change (MoEFCC), covering the 700-km Aravalli range.

Objectives:

- Combat land degradation and desertification across 29 districts.
- Restore ecological balance by increasing green cover and protecting biodiversity.
- Strengthen carbon sequestration under India's climate commitments (NDC-UNFCCC).
- Revive surface water bodies and promote community participation.

Key Features:

- 29 districts across Haryana, Rajasthan, Gujarat, and Delhi identified for plantation.
- 1,000 nurseries to be developed with native species using funds from CAMPA, MNREGA, and state schemes.
- Focus on agroforestry, pasture development, and rejuvenation of lakes and ponds.
- Integration with existing missions like 'Ek Ped Maa Ke Naam'.
- Promotion of eco-tourism: safaris, trekking, and nature parks to involve local communities.
- Target: Complete Phase I by 2027 and action plan released during COP16 of UNCCD in Riyadh.

About the Aravalli Range:

States Covered:

- Delhi, Haryana, Rajasthan, and Gujarat (spanning over 670 km).

Geographical and Ecological Significance:

- One of the oldest fold mountain ranges in the world (formed during the Proterozoic Era).
- Acts as a natural barrier against the spread of the Thar Desert into NCR.
- Highest peak: Guru Shikhar in Mount Abu, Rajasthan (1,722 metres).
- Source of key rivers: Banas, Sahibi (tributaries of Yamuna), and Luni (flows into Rann of Kutch).
- Composed of ancient rocks and rich in minerals like copper, zinc, and marble.

Divided into two parts:

- Sambhar–Sirohi range (includes Guru Shikhar).
- Sambhar–Khetri range (discontinuous ridges).

Chapter-
5

SCIENCE & TECHNOLOGY

Revised Guidelines Under The Biomass Programme

Context:

The Ministry of New and Renewable Energy (MNRE) revised guidelines under the Biomass Programme (Phase-I, 2021–26).

- Aim to streamline clean energy adoption, support MSMEs, and address stubble burning with more flexibility and financial incentives.

About Revised Guidelines Under the Biomass Programme:

- Launched by: MNRE under National Bioenergy Programme Phase-I
- Term: 2021–22 to 2025–26
- Objective: Promote briquette/pellet manufacturing and biomass (non-bagasse) based cogeneration in industries.
- Targeted Plants: Biomass briquette/pellet units & industrial biomass-based cogeneration setups.

Key Features:

CFA Support:

- 9 lakh per MTPH for briquette/pellet plants (max 45 lakh/plant)
- 40 lakh/MW for cogeneration projects (max 5 crore/project)
- E.g. A 2 MTPH pellet plant can avail 18 lakh assistance.
- Monitoring Mechanism: Mandates Supervisory Control and Data Acquisition (SCADA) or IoT-based remote monitoring for transparency.
- Eligibility Criteria: Only new equipment eligible for subsidy and projects to be routed via an online portal.
- Inspection Agencies: SNAs and Sardar Swaran Singh National Institute of Bio-Energy (SSS-NIBE)

Revised Biomass Guidelines:

- Simplified Documentation: Removes several clearance paperwork requirements for MSMEs.
- Flexible Sale Agreements: Replaces mandatory 2-year contracts with general sales agreements.
- IoT-based Monitoring: Allows cost-effective digital monitoring over expensive SCADA.
- Performance-based Subsidy:
- Projects with 80%+ operation receive full Central Financial Assistance (CFA) and others get pro-rata.
- E.g. A plant operating at 70% will get 7/8th of eligible CFA.
- Shortened Inspection Duration: 3-day 16-hour inspection now reduced to 10 hours continuous operation.
- Stubble Management Provision: Pellet producers in Delhi, Punjab, Haryana, NCR can choose MNRE or CPCB support scheme.

Need for Revision:

- Regulatory Overload for MSMEs: Complex documentation and multi-tier approvals discouraged small biomass entrepreneurs from participating in the scheme effectively.
- E.g. MSMEs lacked capacity to navigate environmental and financial compliance burdens.

- High Monitoring Costs: Mandating SCADA systems increased capital burden for low-scale biomass units, making adoption economically unviable.
- E.g. A SCADA system costs 20–30 lakh, unaffordable for plants under 2 MTPH capacity.
- Ineffective Stubble Management: Northern states faced persistent crop residue burning due to inadequate support for biomass pelletization infrastructure.
- E.g. Punjab alone generates over 20 million tonnes of paddy stubble annually – CEEW.
- Inflexible CFA Norms: Linking subsidy only to 80% plant performance excluded semi-operational units, delaying uptake and limiting rural biomass penetration.
- E.g. Plants facing seasonal feedstock issues couldn't qualify despite viable operation.

Significance of the Revisions

- Improved Business Viability: Simplified contracts and reduced paperwork attract more private sector investment, especially from decentralized players.
- E.g. General sale agreements allow local pellet traders to operate without fixed buyers.
- Inclusive Technological Access: Allowing IoT or quarterly monitoring enables low-cost compliance, boosting digital integration in Tier-2/3 biomass units.
- E.g. IoT solutions cost 70% less than SCADA systems for data tracking.
- Support for India's Climate Goals: Enhanced biomass usage directly contributes to reduced GHG emissions and helps transition from fossil fuels.
- E.g. MNRE data estimates 1 MW biomass saves ~1,000 tonnes of CO_2/year.
- Boost to Rural Circular Economy: Localised biomass plants promote waste-to-wealth conversion, create jobs, and support farm income diversification.
- E.g. Briquette units generate ~10–15 direct jobs per MTPH of installed capacity.
- Transparent and Targeted Subsidy: Output-based disbursement ensures only productive and operational plants receive financial support, curbing misuse.
- E.g. Plants operating at 75% PLF get proportionate CFA, incentivising higher efficiency.

Conclusion

The revised biomass guidelines represent a pragmatic step towards decarbonising India's energy matrix while empowering MSMEs. By linking incentives to performance and simplifying processes, MNRE strengthens both environmental outcomes and industrial innovation.

Silica Gel Desiccant

Context:

Silica gel sachets, often found in packaged goods with the label "Do Not Eat", have raised public curiosity about their purpose, safety, and reuse amid growing awareness of consumer product safety.

About Silica Gel Desiccant:

- Silica gel is a desiccant, meaning it absorbs and retains moisture to keep its surroundings dry.
- Commonly found as small, translucent beads in paper or cloth sachets.

Chemical Composition:

- Composed of silicon dioxide (SiO_2) — the same basic component as quartz or sand.
- Non-toxic in most forms and chemically inert, but sometimes coated with cobalt chloride (a toxic moisture indicator)

How Silica Gel Works?

- Silica gel is highly porous at the nanoscale.
- Water is absorbed through capillary condensation, mimicking natural mechanisms like how trees transport water.

- A single gram can have a surface area of up to 700 m^2, increasing its absorption efficiency dramatically.

Key Features:

- Hydrophilic nature: Strong affinity for water molecules.
- Non-toxic base: Safe if accidentally touched or inhaled, but still a choking hazard.
- Colour change variants: Some gels change colour (e.g., blue to pink) to signal moisture saturation.
- Rechargeable: Can be reused after drying in an oven at 115–125°C.

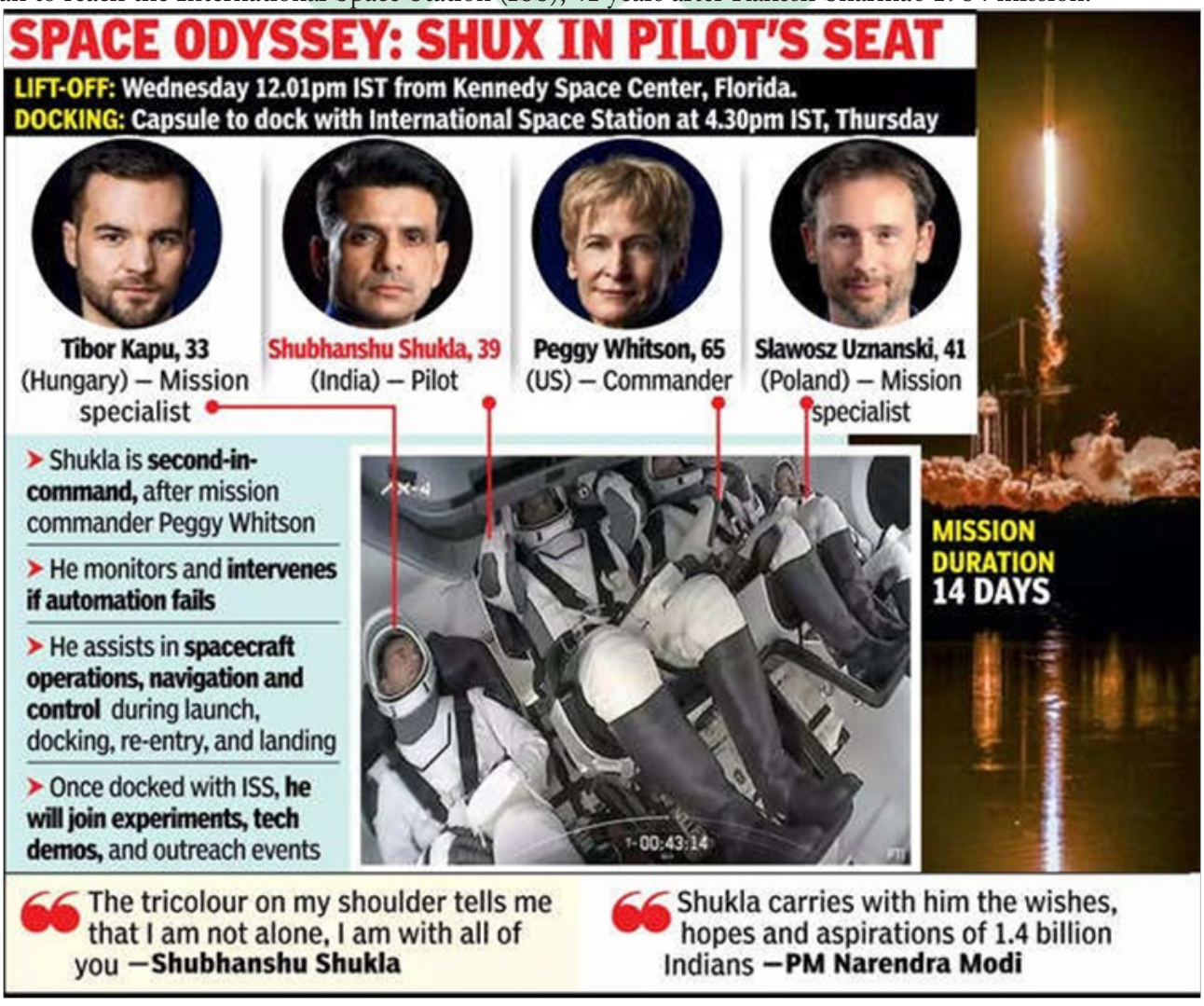
Applications of Silica Gel:

- Consumer Products: Electronics, shoes, clothes, and food packaging to prevent mold or spoilage.
- Pharmaceuticals: In medicine bottles and vitamin packs to avoid moisture degradation.
- Industrial Use: Protects sensitive instruments, chemicals, and camera lenses.
- Storage & Preservation: Used in libraries, museums, and households to preserve photographs, documents, and films.
- Toxicity and Safety:
- Most silica gel is non-toxic, though it poses a choking hazard.
- Variants with cobalt chloride (blue when dry, pink when wet) are toxic and mainly used in industrial settings.
- Ingestion may cause discomfort but is rarely poisonous unless toxic dyes or chemicals are added.

Axiom Mission 4 (Ax-4)

Context:

India marked a historic moment in space exploration as Group Captain Shubhanshu Shukla became the first Indian to reach the International Space Station (ISS), 41 years after Rakesh Sharma's 1984 mission.



About Axiom Mission 4 (Ax-4):

- Ax-4 is the fourth private human spaceflight mission by Axiom Space to the ISS, designed to advance international collaboration and conduct cutting-edge research in microgravity.

Organizations Involved:

- Axiom Space (Mission organizer)
- NASA (Host at ISS)
- SpaceX (Launch vehicle and Dragon capsule provider)

Launch Site & Timeline:

- Launch Pad: LC-39A, Kennedy Space Center, Florida
- Launch On: June 25, 2025.
- Mission Duration: ~14 days aboard the ISS

Mission Objectives:

Microgravity Research:

- Over 60 experiments covering life sciences, material science, human physiology, and Earth observation.
- International Outreach & Collaboration:
- Fosters cooperation in low-Earth orbit research, setting a precedent for future global partnerships in space.

National Program Development:

- Enables participating countries to leap forward in their human spaceflight capabilities.

Crew Members:

- Peggy Whitson (USA) – Commander, holds the U.S. record for longest cumulative time in space.
- Shubhanshu Shukla (India) – Pilot, first Indian to reach ISS and second Indian in space.
- Sławosz Uznański (Poland) – ESA Mission Specialist, second Polish astronaut after 1978.
- Tibor Kapu (Hungary) – Mission Specialist, second Hungarian astronaut after 1980.
- Zero-G Indicator: "Joy" the baby swan toy—selected by Shukla and his 6-year-old son Sid.

Significance to India:

Revival of Human Spaceflight:

- Shukla becomes the first Indian to enter ISS and only the second Indian in space since 1984.

Boost to Gaganyaan & Space Station Plans:

- Mission complements India's ambition to launch its own crewed space mission (Gaganyaan) and build an Indian space station by 2035.

Scientific Leadership:

- India leads and participates in multiple experiments, expanding India's role in space science diplomacy.

Delhi Artificial Rain Project

Context:

The Delhi Government has launched its first 3.21 crore artificial rain pilot project in collaboration with IIT-Kanpur and IMD to reduce air pollution through cloud seeding technology.

About Delhi Artificial Rain Project:

What it is?

- Artificial rain refers to the technique of inducing rainfall by dispersing substances into moisture-laden clouds — aimed at improving air quality in Delhi.

Method Used:

- Uses cloud seeding by aircraft, dispersing agents like silver iodide and rock salt into clouds.
- Conducted in partnership with IIT-Kanpur, with technical support from IMD.

How It Works?

- Small aircraft will release a seeding mixture into nimbostratus clouds (with over 50% moisture).
- The agents act as condensation nuclei, helping cloud droplets grow and trigger precipitation, washing out pollutants.

Key Features:

- Advanced Seeding: Aircraft-mounted flares with silver iodide, rock salt, iodised salt trigger rain formation.
- Targeted Operations: Five 90-minute flights targeting ~100 sq km of Delhi's most polluted areas.
- Scientific Monitoring: Real-time air quality tracking via CAAQMS for PM2.5 and PM10 reductions.
- First Urban Use: Builds on successful IIT-Kanpur trials in drought regions — now adapted for pollution control.
- Multi-agency Effort: Collaboration of Delhi Govt, IIT-Kanpur, IMD, with military-grade operational precision.

Significance:

- Aimed at reducing severe PM2.5/PM10 pollution episodes in Delhi winters.
- Provides scientific data for scaling up cloud seeding in other polluted Indian cities.
- Supports Delhi's push for 'right to clean air' and innovative urban environmental governance.

New FASTag-Based Annual Pass

Context:

Union Minister of Road Transportation announced that the new FASTag-based annual pass will roll out on August 15, offering smoother toll payments and reduced congestion for private vehicles on national highways.

About New FASTag-Based Annual Pass:

What is FASTag?

- An electronic toll collection system that allows vehicles to pay highway tolls automatically using RFID-based technology, avoiding stops at toll booths.
- Launched in: Pilot in 2014 on the Ahmedabad-Mumbai corridor
- Mandatory Since: February 15, 2021 for all four-wheelers
- Ministry Involved: Ministry of Road Transport and Highways (MoRTH)
- Implementing Agency: National Highways Authority of India (NHAI)

Working Principle:

- FASTag is a RFID-enabled sticker fixed to a vehicle's windshield.
- Linked to a prepaid wallet or bank account.
- Toll amount is auto-deducted as the vehicle passes a toll plaza.

Key Features of FASTag:

- Cashless & Contactless Tolling: Enables automatic toll payments through RFID scanning, eliminating the need for cash transactions or stopping at toll booths.
- Reduced Congestion & Fuel Savings: Speeds up vehicle movement at toll plazas, cutting idle time and reducing fuel wastage.
- Boosts Digital Transactions: Encourages a fully digital toll payment ecosystem, aligned with India's Digital India vision.
- Vehicle-Specific & Non-Transferable: Each FASTag is uniquely linked to a particular vehicle and cannot be transferred or used across multiple vehicles.

- Multiple Channels for Purchase: FASTags are widely available via authorised banks, e-commerce platforms, mobile apps, and NHAI outlets, making it easy for users to obtain and recharge.

About FASTag-Based Annual Pass:

What is it?

- A prepaid toll passes worth 3,000 for non-commercial private vehicles such as cars, jeeps, and vans.

Key Features:

- Validity: 1 year from activation or 200 highway trips, whichever is earlier.
- Activated via Rajmarg Yatra app and NHAI/MoRTH websites.
- Reduces toll payments in short stretches (within 60 km gaps between toll plazas).
- Lowers waiting time, congestion, and disputes at toll booths.
- Aims to simplify highway travel for frequent private vehicle users.

Salmonella Outbreak

Context:

A Salmonella outbreak in the US has infected 79 people and led to a recall of 1.7 million egg cartons by the California-based August Egg Company.

About Salmonella Outbreak:

What is Salmonella?

- Salmonella is a bacterial infection that causes salmonellosis, a foodborne illness affecting the intestinal tract.
- It spreads through contaminated food, water, or direct contact with infected humans or animals.

Causes of Salmonella Infection:

- Raw or undercooked eggs and poultry (especially chicken).
- Contaminated meat, dairy, fruits, vegetables, and even processed items like nut butters.
- Pets and reptiles can carry and spread the bacteria.
- Poor hygiene during food preparation or after bathroom use.

Symptoms of Infection:

- According to CDC, symptoms usually appear 12–96 hours after exposure and include:
- Diarrhoea (possibly bloody), Stomach cramps and nausea, Fever and chills, Headache and vomiting, and Loss of appetite

Is Salmonella Contagious?

- It spreads person-to-person via contaminated hands, surfaces, and utensils.
- Close contact with infected individuals or animals increases risk, especially in poor hygiene conditions.

Prevention Strategy:

- Practice safe cooking: Thoroughly cook meat, poultry, and eggs; avoid raw dough or egg-based foods.
- Maintain hygiene: Wash hands before meals, after bathroom use, and after handling pets or raw food.

New-Generation Weight-Loss Drugs

Context:

A recent U.S. study published in the journal Obesity reveals that new weight-loss drugs like semaglutide and tirzepatide show reduced effectiveness in real-world settings compared to clinical trials.

About New-Generation Weight-Loss Drugs:

What are They?

- Injectable GLP-1 receptor agonists originally developed to manage Type 2 diabetes, now repurposed for chronic weight management.

Key Drugs:

- Semaglutide (branded as Ozempic/Wegovy) – developed by Novo Nordisk
- Tirzepatide (branded as Mounjaro/Zepbound) – developed by Eli Lilly

Features:

- Mimic the action of GLP-1 (glucagon-like peptide-1) to suppress appetite and slow digestion.
- Shown to cause 10-15% body weight loss in controlled clinical trials.
- Approved by US FDA also recently introduced in India for obesity management.

Limitations:

- Low adherence in real life: Many patients discontinue treatment early or reduce dosage due to cost, side effects, or lack of follow-up.
- Economic constraints: High cost of GLP-1 drugs limits long-term use, especially in developing countries like India where out-of-pocket expenditure is high.
- Dependency for sustained impact: Weight regains occurs quickly after discontinuation, making long-term adherence essential for benefit.

KATRIN experiment

Context:

The KATRIN experiment in Germany has published the most stringent upper limit yet on the sum of the masses of the three types of neutrinos, capping it at 8.8×10^{7} times the mass of an electron—twice as precise as previous estimates.

About KATRIN experiment:

What is KATRIN?

- The Karlsruhe Tritium Neutrino (KATRIN) Experiment is a precision physics project that studies the mass of neutrinos using beta decay of tritium.
- Developed by: Conducted by an international collaboration led by the Karlsruhe Institute of Technology (KIT), Germany.
- Nations Involved: Major institutions from Germany, the U.S., and other European countries contribute to the experiment.
- Objective: To directly measure the absolute mass of neutrinos—a major unsolved question in particle physics.

Key Features of KATRIN:

- Massive Detector: Uses a 200-tonne spectrometer for ultra-precise electron energy measurements during tritium decay.
- Tritium Disintegration Monitoring: Observes beta decay of tritium to track maximum energy of electrons, revealing neutrino mass.
- Robust Data Collection: Analysed over 36 million electrons across 259 days, making it one of the most data-rich neutrino studies.
- Direct Measurement Method: Unlike cosmological studies, KATRIN does not rely on early universe assumptions or models.

Significance of KATRIN:

- Breakthrough in Neutrino Physics: Set a new upper limit on the sum of neutrino masses—a critical input for physics beyond the Standard Model.
- Validates and Challenges Theory: Confirms neutrinos have mass, challenging the Standard Model which assumes massless neutrinos.
- Clue to New Physics: Opens path to identify new forces or particles like Majorana vs Dirac neutrinos, which could reshape particle physics.
- No Model Bias: Result is model-independent, making it more reliable than cosmological estimates that rely on multiple assumptions.
- Foundation for Future Experiments: Sets technical standards for future neutrino detectors and decay experiments worldwide.

BharatGen AI Model

Context:

India launched 'BharatGen', its first government-funded multimodal Large Language Model (LLM) designed for Indian languages at the BharatGen Summit 2025.

About BharatGen AI Model:

What is It?

- 'BharatGen' is a multimodal Large Language Model (LLM) that supports text, speech, and image-based AI outputs in 22 Indian languages, developed to meet India's regional, linguistic, and cultural diversity needs.
- Developed By: Led by the TIH Foundation for IoT and IoE at IIT Bombay.
- Funded under: The National Mission on Interdisciplinary Cyber-Physical Systems (NM-ICPS).

Objectives:

- To build a democratic AI ecosystem rooted in Indian languages and values.
- To create ethical, inclusive AI tools accessible to all regions and social groups.
- To support region-specific solutions across governance, health, education, and agriculture.
- To foster AI-based entrepreneurship, innovation, and R&D capacity in India.

Key Features:

- Multimodal Capabilities: Integrates text, speech, and image processing to offer a wide range of AI applications.
- Language Diversity: Trained on 22 Indian languages, including major and regional dialects.
- Inclusive Development: Designed to address rural and underserved communities, especially in health and governance.
- Scalability: Supports national platforms like CPGRAMS, AI-powered telemedicine, and AI in education.
- Collaborative Architecture: Combines efforts of government, academia, startups, and students through hackathons and R&D parks.

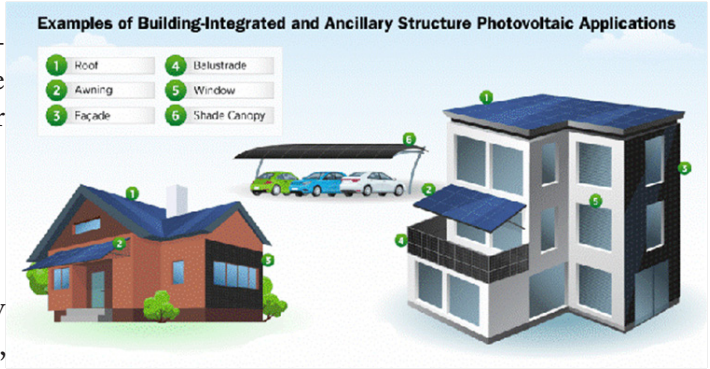
Significance:

- National Innovation Push: Aligns with "India's Techade" vision for tech-driven inclusive growth.
- Cultural Relevance: Offers context-aware AI solutions reflecting Indian societal ethos.
- Education Reform: Embeds AI in learning under NEP 2020, bridging humanities and technology.

Building-Integrated Photovoltaics (BIPV)

Context:

India is witnessing a surge in interest around Building-Integrated Photovoltaics (BIPV), and updates under the PM Surya Ghar Yojana highlighting its potential for clean energy in urban spaces.



About Building-Integrated Photovoltaics (BIPV):

Definition:

- BIPV involves embedding solar panels directly into a building's envelope — like façades, windows, and rooftops — transforming them into energy-generating structures.

- Dual Role: It replaces traditional construction materials (glass, tiles, cladding) while simultaneously generating electricity.

Features of BIPV:

- Aesthetic Flexibility: BIPV systems can be customized in terms of transparency, color, shape, and size to blend into building architecture.
- Space Efficiency: Unlike conventional rooftop solar, BIPV utilizes vertical surfaces like façades and railings — crucial for space-constrained urban areas.
- Structural Integration: BIPV functions as part of the building fabric, reducing additional installation effort and costs in the long run.

How BIPV Works?

- Photovoltaic Integration: Solar cells are integrated into construction elements like glass panels or roofing materials.
- Electricity Generation: These panels absorb sunlight and convert it into electricity, reducing the building's grid dependency.
- Passive Cooling Benefits: Semi-transparent panels reduce solar heat gain, improving indoor energy efficiency.

Advantages of BIPV

- Space-efficient solar adoption: BIPVs use façades, railings, and windows — ideal for high-rise buildings with limited rooftop space.
- E.g. A façade can generate 150 kWp vs. 40 kWp from rooftop alone.
- Aesthetic integration: They blend with architecture and are customizable in color, shape, and transparency, unlike conventional solar panels.
- E.g. Renewable Energy Museum, Kolkata features a solar-powered dome.
- Dual-purpose functionality: Replaces traditional construction materials like glass or tiles while generating clean energy.
- Improves energy efficiency: BIPVs reduce heat gain and contribute to passive cooling, lowering AC demand.
- E.g. Semi-transparent façade panels cut indoor heat load.
- Long-term economic savings: Though upfront cost is high, electricity savings over years can offset initial investment.
- E.g. German balcony BIPVs help save up to 30% in bills.

Challenges of BIPV:

- High initial costs: Installation is costlier than traditional rooftop solar due to material, design, and structural integration.
- Lack of awareness: Architects, builders, and citizens are largely unaware of BIPV options and benefits.
- Policy vacuum: Absence of dedicated regulatory norms or performance standards delays adoption.
- Limited domestic manufacturing: Heavy reliance on imported BIPV components increases costs and supply vulnerability.
- Exclusion from planning stages: BIPV is often not considered during early building design, limiting integration possibilities.

Significance of BIPV in India:

- Urban solar potential: Helps meet solar targets in densely built cities where land/rooftop space is scarce.
- E.g. 309 GW potential via BIPV on existing building stock (World Bank).
- Supports climate commitments: Reduces carbon emissions from buildings, aligning with India's Paris Agreement targets.
- Decentralized clean energy: Enables localized power generation and reduces pressure on central grids.
- Boosts green infrastructure: Encourages eco-friendly construction under Smart Cities and AMRUT missions.
- Economic opportunity: Promotes innovation in green architecture, new markets for solar design, and green jobs in construction.

Conclusion:

BIPV offers a transformative path for energy-positive buildings, blending utility with aesthetics. Its success demands robust policy backing, financial incentives, and awareness drives. Scaling BIPV now can redefine urban sustainability in India.

Antibiotic-Producing Thermophilic Bacteria

Context:

Researchers from Vellore Institute of Technology have discovered antibiotic-producing thermophilic bacteria in Rajgir hot spring, Bihar, opening new avenues in the fight against antimicrobial resistance.

About Antibiotic-Producing Thermophilic Bacteria:

Definition:

- Thermophiles are heat-loving microorganisms that thrive in extreme temperatures ranging from 45°C to 70°C, where most life forms cannot survive.

Characters of Thermophilic Bacteria:

- Heat Tolerance: Thermophilic bacteria grow best at high temperatures between 45°C and 80°C. They thrive where most other microbes cannot survive.
- Heat-Stable Enzymes: They produce enzymes that remain active at high temperatures. These enzymes are used in industries like PCR testing and biofuel production.
- Strong Cell Membranes: Their cell membranes contain special fats that resist melting. This helps them stay intact in extreme heat.
- Unique Metabolism: Thermophiles can use unusual nutrients like sulfur or iron. This allows them to live in mineral-rich, low-competition areas.
- Survival Mechanisms: Some thermophiles form spores or have strong DNA repair systems. These features protect them in harsh and changing environments.

Examples of Thermophiles:

- Thermus aquaticus (used in PCR tests)
- Actinobacteria (noted for antibiotic production)
- Sulfolobus acidocaldarius (found in acidic hot springs)
- Key Features of Antibiotic-Producing Thermophilic Bacteria:
- Heat-Stable Enzymes: Thermophiles produce enzymes that remain active at high temperatures, making them ideal for industrial applications like PCR and fermentation.
- Antibiotic Synthesis: They generate potent antimicrobial compounds to eliminate rival microbes in extreme environments, useful in combating resistant pathogens.
- Unique Metabolic Pathways: Their survival in extreme conditions is enabled by novel metabolic processes, often leading to the discovery of rare bioactive molecules.

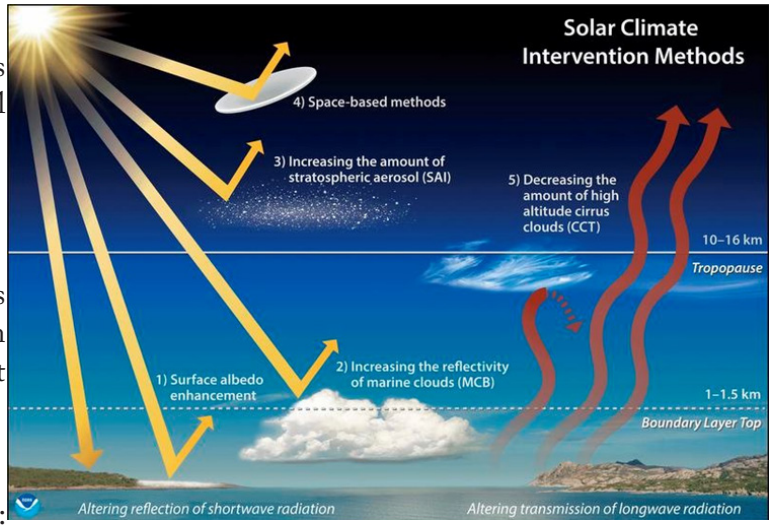
Applications of Thermophiles:

- Medical: They are a promising source of new antibiotics—like diethyl phthalate from Rajgir—which combat drug-resistant infections such as Listeria monocytogenes.
- Agriculture: Thermophilic microbial blends enhance soil fertility and crop resilience by promoting growth under harsh environmental conditions.
- Industrial: Their heat-resistant enzymes are used in processes like polymerase chain reaction (PCR), biofuel generation, and waste degradation.

Solar Climate Intervention Techniques

Context:

A new study in Earth's Future journal proposes a low-altitude version of Stratospheric Aerosol Injection (SAI) using modified existing aircraft.



About Solar Climate Intervention Techniques:

What is Solar Climate Intervention?

- It refers to geoengineering technologies aimed at reducing incoming solar radiation to counteract global warming effects without cutting greenhouse gas emissions.

Key Types of Techniques:

- Stratospheric Aerosol Injection (SAI): Spraying sulphur dioxide or other particles into the stratosphere to reflect sunlight and cool Earth.
- Marine Cloud Brightening: Involves spraying sea salt into marine clouds to increase their reflectivity.
- Space-Based Reflectors: Hypothetical deployment of mirrors or shades in space to block a portion of sunlight.
- Surface Albedo Modification: Lightening surfaces (like painting roofs white or planting reflective crops) to reflect more sunlight.

How Stratospheric Aerosol Injection (SAI) Works?

- Inspired by volcanic eruptions (e.g., Mount Pinatubo, 1991) that cooled global temperatures by emitting aerosols.
- Sulphur dioxide aerosols are released at high altitudes (~13–20 km) to form a reflective layer.
- This layer reflects sunlight back into space, reducing global surface temperatures.
- Duration of particles in the stratosphere: months to years, depending on injection altitude.

Significance Of SAI:

- Rapid Cooling: Could lower global temperatures within a year of deployment.
- Cheaper Alternative: More affordable than decarbonisation strategies.
- Buys Time: Offers short-term relief while countries scale up renewable energy.
- Scientific Learning: Opens avenues for microgravity aerosol research, modelling, and international coordination.

Limitations:

- Global Side Effects: Uneven regional cooling and could disrupt monsoons, rainfall, and crop patterns.
- Ozone Layer Threat: May delay ozone hole recovery.
- Acid Rain Risk: Sulphur compounds may lead to acid precipitation.
- Governance Challenges: Affects all nations but may be initiated unilaterally – creating geopolitical tensions.
- High Volume Needed at Lower Altitudes: 2–3x more aerosol needed if injected at ~13 km vs 20 km.

Magnetic Isolation and Concentration (MagIC)

Context:

A new technique called Magnetic Isolation and Concentration (MagIC) has enabled cryo-electron microscopy (cryo-EM) to analyse samples 100 times more dilute than earlier.

About Magnetic Isolation and Concentration (MagIC):

What is MagIC?

- MagIC stands for Magnetic Isolation and Concentration – a novel enhancement to cryo-electron microscopy (Cryo-EM).

- It enables the imaging of ultra-dilute biological samples—100 times more dilute than what was previously possible.

How It Works?

- Tagging: Molecules of interest are bound to magnetic beads (about 50 nm in size).
- Magnetic Clustering: A magnet is used to pull and cluster these bead-bound molecules into dense regions on the cryo-EM
- Image Capture: The concentrated clusters allow more usable particles per image, making detection feasible even at <0.0005 mg/ml
- DuSTER Algorithm: An AI-based tool filters out background noise by selecting only those particles that are consistently detected across multiple imaging passes.

About Cryo-Electron Microscopy (Cryo-EM):

- What is Cryo-EM?
- A revolutionary imaging technique that captures 3D structures of biomolecules at near-atomic resolution.
- It involves rapid freezing (vitrification) of samples and imaging them using electron beams.
- Developed by:
- Initially developed in the 1980s.
- Recent advancements in hardware and image-processing algorithms earned the 2017 Nobel Prize in Chemistry (awarded to Dubochet, Frank, and Henderson).

Working Principle:

- Sample Preparation: Protein solutions are rapidly frozen using cryogenic liquids (e.g. ethane) into amorphous ice to preserve natural structures.
- Imaging: Electron beams pass through the frozen sample producing multiple 2D projections.
- Data Processing: Computational software reconstructs a 3D density map from thousands of 2D particle images.
- Structure Modelling: Final atomic-level models are fitted into this density for biological insights.

Applications of Cryo-EM:

- Structural Biology: Mapping large, flexible macromolecules like ribosomes, ion channels.
- Virology: Revealing virus capsids (e.g. SARS-CoV-2 spike protein).
- Cell Biology: Imaging cell organelles, cytoskeletons, mitotic spindles.
- Neurobiology: Understanding synaptic vesicles and neuronal signalling.
- Drug Discovery: Designing inhibitors by visualizing protein-ligand binding sites.
- Molecular Biology: Visualizing RNA polymerases, ribosomes, and translation complexes.

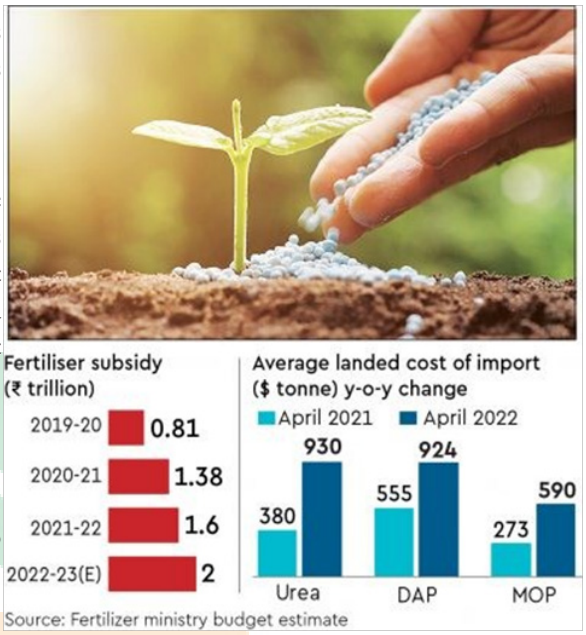
Chapter-
6

ECONOMY

Reforming India's Food and Fertiliser Subsidies

Context:

With poverty levels now at historic lows (5.3%) and subsidy bills rising steeply, there is a growing policy debate on reforming India's food and fertiliser subsidies to improve efficiency.



About Reforming India's Food and Fertiliser Subsidies:

A subsidy is a financial support or incentive provided by the government to individuals, businesses, or sectors to make goods or services more affordable or to encourage desired economic activities. It helps lower the cost of production or consumption and is aimed at achieving social welfare, economic efficiency, or public policy goals.

Types of Subsidies:

1. Direct Subsidy:

- Government provides cash transfers or direct payments to beneficiaries.
- Example: PM-KISAN income support to farmers.

1. Indirect Subsidy:

- Government reduces the cost of goods/services via tax exemptions or price controls.
- Example: Subsidised foodgrains under NFSA, subsidised LPG cylinders.

Data points:

- Food Subsidy FY26: 2.03 lakh crore (source: Ashok Gulati article).
- Fertiliser Subsidy FY26: 1.56 lakh crore (source: Ashok Gulati article).
- Poverty Decline: Extreme poverty reduced from 27.1% in 2011 to 5.3% in 2022 (source: Ashok Gulati article).
- Current PDS Coverage: Free foodgrains given to 800 million people (source: Ashok Gulati article).
- Public Distribution System Reach: 84% households had ration cards in FY 2022–23, with 59% under BPL, AAY, or PHH categories (source: Economic Survey 2025).
- Gini Coefficient Improvement: Rural Gini coefficient improved from 0.266 in 2022–23 to 0.237 in 2023–24 (source: Economic Survey 2025).

Need for Reforms in Food and Fertiliser Subsidy:

- Poverty Trends: With extreme poverty falling to 5.3%, providing blanket subsidies to 800 million people is fiscally inefficient and fails to reflect actual poverty levels.
- Leakages: Despite digitisation (84% ration card coverage), PDS leakages and ghost beneficiaries persist (e.g., Jharkhand's cancelled cards), leading to poor targeting.
- Nutrition Gap: Current PDS focuses heavily on cereals (rice, wheat) but neglects protein-rich and micronutrient foods, failing to address nutrition security.
- Fertiliser Imbalance: Overuse of nitrogen-based fertilisers (urea) and underuse of P and K have damaged soil health, leading to declining yields and soil nutrient depletion.
- Fiscal Pressure: High food and fertiliser subsidies crowd out capital investment in critical rural infrastructure like roads, irrigation, and storage facilities.

Initiatives Taken:

For Food Subsidy:

- PM Garib Kalyan Anna Yojana (PMGKAY): Launched in 2020 to provide 5 kg free foodgrains per person/month to all NFSA beneficiaries during COVID and now integrated into NFSA provisions.
- Digitisation of Ration Cards: ~84% coverage through Aadhaar seeding and ePOS machines to improve targeting and reduce leakages.
- Strengthening TPDS: Adoption of Targeted Public Distribution System (TPDS) to better focus on BPL, Antyodaya (AAY) families for subsidised grains.
- Expanded PDS Commodities: Some states now supply pulses, edible oils, iodised salt via PDS to improve nutritional diversity beyond cereals.

For Fertiliser Subsidy:

- Neem-Coated Urea: Mandatory coating to reduce black marketing and promote slow nitrogen release for better soil health.
- Nutrient-Based Subsidy (NBS) Policy: Subsidy linked to nutrient content (N, P, K, S) to encourage balanced fertiliser use (non-urea fertilisers).
- Direct Benefit Transfer (DBT): Pilots and partial rollout for DBT of fertiliser subsidy to companies and farmers buy at lower prices via retailers.
- Price Regulation for Key Fertilisers: Government controls prices of urea, DAP, MOP — ensuring affordable access for farmers and stability in input costs.

Measures Needed:

- Food Coupons/Digital Wallets: Shift to digital coupons for bottom 15% population (~ 700/family/month) to buy diverse foods (pulses, milk, eggs).
- Targeting & Gradation: Tailor subsidy levels based on beneficiary income data (use PM-KISAN, Aadhaar, SECC databases).
- Fertiliser Coupons: Issue fertiliser coupons to farmers and deregulate prices to promote balanced and eco-friendly use.
- Encourage Alternatives: Incentivise bio-fertilisers and natural farming.
- Strengthen Monitoring: Triangulate data (PM-KISAN, land records) to improve targeting and reduce inclusion/exclusion errors.
- Political Communication: Build trust with farmers through advance communication to avoid resistance (as seen in earlier protests).

Conclusion:

India has made remarkable progress in poverty reduction and agriculture growth. But with a bloated subsidy bill and changing rural realities, it is time for smart reforms that promote nutrition, fiscal prudence, and environmental sustainability. Timely reform in food and fertiliser subsidies will ensure that public funds deliver maximum welfare impact.

US Issue Level 2 Travel Advisory for India

Context:

The US State Department issued a Level 2 Travel Advisory for India, urging citizens to exercise increased caution due to rising violent crime and terrorism threats.

About US Issue Level 2 Travel Advisory for India:

What it is?

- A Level 2 advisory is part of the US State Department's 4-level travel alert system that advises citizens on international travel risks. Level 2 means "Exercise Increased Caution".
- Published by: US Department of State, Bureau of Consular Affairs.

Four Categories of US Travel Advisories:

- Level 1 – Exercise Normal Precautions
- Level 2 – Exercise Increased Caution
- Level 3 – Reconsider Travel
- Level 4 – Do Not Travel
- Key Issues in Latest Advisory on India:

Violent Crime and Sexual Assaults:

- Reports of rape and violent attacks at tourist destinations have risen.
- The advisory urges travellers, especially women, to avoid solo travel.

Terrorism Threats:

- Terror attacks may occur without warning in crowded spaces — markets, public transport hubs, religious places, and government buildings.
- Restricted access for US officials in parts of eastern Maharashtra, Telangana, and West Bengal due to Naxalite presence.

High-Risk Areas Identified:

- Jammu & Kashmir: Do not travel due to terrorism and unrest.
- India–Pakistan Border: Do not travel due to armed conflict risk.
- Central & Eastern India (e.g., Chhattisgarh, Jharkhand): Terror threats by Naxalite groups.
- Manipur: Avoid due to ethnic violence.
- Northeastern states: Reconsider travel to parts of Arunachal Pradesh, Sikkim, and remote border regions due to insurgent activity.

Legal and Travel Restrictions:

- Satellite phones and GPS devices are banned; violation leads to jail or fine.
- E-visas are not valid for land crossings.
- Violations of immigration rules can lead to deportation or legal action.

Impacts of the Advisory:

- Diplomatic Implication: May strain India–US people-to-people ties and affect tourism exchanges.
- Tourism Sector Impact: May deter US travellers from visiting India, hurting the tourism economy.
- Regional Sensitivities: Highlights security lapses in border and insurgency-prone areas, prompting national response.
- Policy Review: Encourages India to bolster law enforcement and tourist safety, particularly in sensitive zones.
- Perception Challenge: Affects India's global image as a safe tourist and business destination.

Predatory Pricing

Context:

The Competition Commission of India (CCI) has notified the Determination of Cost of Production Regulations, 2025, introducing ATC-based cost norms to tackle predatory pricing and enhance competition safeguards.

About Predatory Pricing:

- Definition: Predatory pricing is a strategy where a dominant firm sets artificially low prices to eliminate competitors, thereby gaining monopoly power.
- Example: NSE vs. MCX case — low-cost tactics to drive out rivals in stock exchange services.

Core Features:

- Prices set below production costs
- Aimed to drive out market competitors
- Benefits to consumers are short-term
- Long-term monopoly leads to high prices and fewer choices

Types of Predatory Pricing:

- Direct Predation: Pricing below cost to drive out competitors.
- Cross-subsidisation: Using profits from one product/service to subsidise losses in another.
- Discriminatory Pricing: Targeted lower prices for specific market segments.

Factors Leading to Predatory Pricing:

- Dominant Market Power: Large firms leverage scale and deep capital reserves to sustain below-cost pricing over prolonged periods.
- Network Externalities: Digital platforms lock users through data advantages, making entry harder for new players.
- Weak Enforcement History: Pre-2025, only 1 successful predatory pricing case (NSE-MCX) — regulatory deterrence was low.
- Regulatory Ambiguity: Older rules lacked clarity on which cost metrics to apply, delaying verdicts.
- Lack of Global Coordination: Cross-border e-commerce giants exploit varying competition regimes.
- Market Myopia: Short-term consumer gains make predation socially invisible until monopolisation sets in.

Issues Surrounding Predatory Pricing:

- Consumer Welfare Trap: Initial low prices give way to monopolistic pricing post-rival exit.
- Difficult Proof of Intent: Establishing "anti-competitive intent" legally remains complex under Section 4 of Competition Act.
- Chilling Effect on Startups: Fear of market capture deters innovation in sunrise sectors like AI, FinTech.
- Fragmented Data Ecosystem: Absence of dynamic market surveillance mechanisms weakens early detection.
- Judicial Delays: Prolonged litigation reduces the effectiveness of penalties in fast-moving digital markets.

Recent 2025 Rules: CCI's New Reforms

- Notified on: May 6, 2025 — replaces 2009 Cost Regulations.

Key Innovations:

- Introduces ATC (Average Total Cost) as a clear benchmark for pricing assessment.
- Removes vague "market value" measure — promoting consistency.
- Mandates expert involvement for complex technical assessments.
- Requires CCI to publicly record reasons when deviating from Average Variable Cost — promotes transparency.
- Provides tools for real-time market monitoring — modernising CCI's enforcement under Section 4.

Significance of New Rules:

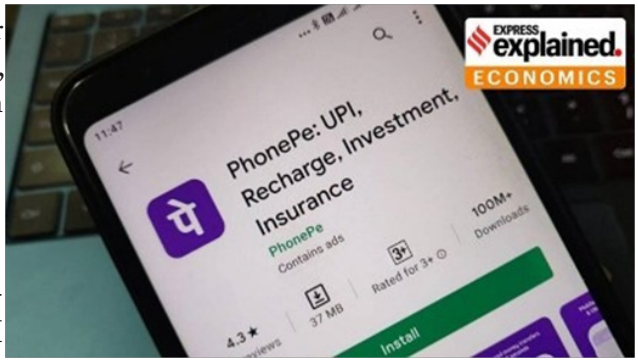
- Upholds Competitive Integrity: Protects both traditional and emerging sectors from abusive pricing practices.
- Strengthens MSME Ecosystem: Safeguards smaller players from capital-driven predation.
- Aligns with OECD Best Practices: Global standards incorporated into Indian framework.
- Addresses Digital Monopoly Risks: Equips CCI to tackle BigTech predatory moves in India's digital economy.
- Promotes Investor Confidence: Transparent and predictable enforcement boosts FDI in competitive markets.
- Supports SDG 8 (Decent Work & Economic Growth): Fair competition fosters broader employment and market diversity.

Conclusion:

The 2025 reforms on predatory pricing mark a progressive step towards fostering transparent markets and protecting consumer welfare. With a refined cost framework and expert-driven enforcement, the CCI is now better equipped to tackle unfair pricing practices, promote healthy competition, and secure long-term market dynamism.

SEBI's New Verified UPI Mechanism

Context:



SEBI has announced a new verified UPI ID system for registered market intermediaries, effective from October 1, 2025, to curb rising cases of cyber fraud and impersonation in securities transactions.

About SEBI's New Verified UPI Mechanism:

What It Is?

- A validated UPI payment framework for SEBI-registered intermediaries featuring exclusive UPI handles ending with @valid.
- Developed By: The system is being developed in coordination with the National Payments Corporation of India (NPCI), which operates the UPI platform.

How It Works?

- Every registered intermediary (broker, mutual fund, etc.) will receive a unique UPI ID: username.category@validBank
- E.g., abc.brk@validXYZ for a broker using XYZ Bank
- A "thumbs-up in green triangle" icon will appear when transacting with verified IDs.
- The system will integrate with the new 'SEBI Check' tool to verify UPI IDs and bank details via QR scan or manual entry.

Key Features:

Distinct suffixes indicate category:

- brk for stock brokers
- .mf for mutual funds
- UPI IDs will only be allocated to genuine SEBI-registered entities.
- Visual authentication marks help users identify legitimate payees.
- 'SEBI Check' confirms both UPI ID and bank account/IFSC code authenticity.

Benefits:

- Investor Protection: Prevents fund diversion by fraudsters.
- Transparency: Allows clear identification of registered entities.
- Cybersecurity Boost: Cuts down fake UPI handles used for scams.
- Trust Restoration: Enhances confidence in digital transactions in the securities market.
- Mandatory Compliance: All intermediaries must adopt the system and older UPI IDs to be phased out.

Microfinance in India

Context:

The RBI Deputy Governor flagged a rising crisis in India's microfinance sector, citing a sharp fall in the gross loan portfolio (13.9%) and surge in delinquencies and NPAs (55,000 crore).

About Microfinance in India:

What is Microfinance in India?

- Microfinance refers to small-ticket financial

services (loans, savings, insurance) extended to low-income households excluded from formal banking.

- Objective: Promote financial inclusion, entrepreneurship, and poverty alleviation through credit access without collateral.

History:

- 1974: India's first MFI – SEWA Bank, Ahmedabad.
- 1976: Grameen Bank by Muhammad Yunus (Bangladesh) popularized global microcredit.
- 2010: Malegam Committee recommended regulatory norms for NBFC-MFIs.
- Regulator: Reserve Bank of India (RBI)

Present Trends in the Microfinance Sector (FY25):

- Loan Portfolio Shrinkage: The gross loan portfolio (GLP) fell by 13.5% to ₹3.75 lakh crore, reflecting reduced disbursals and growing risk aversion by lenders.
- Rising Defaults: Non-performing assets surged to ₹55,000 crore, while loans overdue by 31–180 days (PAR) rose sharply from 2% to 6.2%, signalling deep credit stress.
- Disbursal Dip: Q4 FY25 witnessed a 34% drop in disbursals to ₹70,942 crore YoY, indicating cautious lending amid tightening regulatory scrutiny and defaults.
- Average Loan Size: Despite lower disbursals, average loan ticket size rose by 11.5% to ₹53,897, suggesting lenders are focusing on fewer but higher-value accounts.
- State Trends: Karnataka saw a 17% portfolio drop due to policy backlash, while Bihar, Tamil Nadu, and UP led in active microfinance engagement and outstanding credit.

Challenges to Microfinance:

- Over-indebtedness: Borrowers are taking multiple loans from different entities without proper assessments, resulting in repayment defaults and financial distress.
- High Interest Rates: Even institutions with access to low-cost capital are levying high margins, raising concerns of usury and borrower exploitation.
- Coercive Recovery Practices: Instances of aggressive recovery, borrower harassment, and even suicides have raised ethical and legal alarms in the sector.
- Credit Appraisal Gaps: Poor risk assessment and commission-based lending incentives are pushing loans to financially fragile clients, worsening asset quality.
- State Regulatory Uncertainty: Laws like Karnataka's penal action on coercive recovery practices have disrupted operations of even compliant and formal microfinance players.

Way Ahead:

- Stronger Credit Risk Frameworks: MFIs must integrate better risk profiling tools and limit multiple borrowings to prevent borrower over-leverage and defaults.
- Regulation of Recovery Practices: RBI must enforce a uniform recovery code ensuring borrower dignity and outlawing intimidation and coercion during repayment collection.
- Rate Rationalisation: A ceiling on microloan interest rates and margin controls could curb profiteering and improve affordability for poor borrowers.
- Empathetic Lending: The focus must shift from profit-maximisation to developmental finance that uplifts communities and promotes social equity.
- Tech-Based Monitoring: Using AI, data analytics, and early warning systems can help MFIs predict defaults and monitor repayment health proactively.

Conclusion:

Microfinance remains a vital pillar of India's inclusive development story. However, its potential is hindered by credit quality erosion, ethical breaches, and regulatory lapses. A calibrated approach combining financial prudence with social empathy is essential for sustainable impact.

Collection of Real Time Observations & Photo of Crops (CROPIC)

Context:

The Ministry of Agriculture and Farmers Welfare has launched CROPIC, a tech-driven initiative using AI to monitor crop health and automate crop loss assessment.

- The pilot phase will cover Kharif 2025 and Rabi 2025-26 in 50 selected districts.

About Collection of Real Time Observations & Photo of Crops (CROPIC):

What is CROPIC?

- CROPIC stands for Collection of Real Time Observations & Photo of Crops.
- It is a mobile app-based initiative to photograph standing crops and analyse them using AI-powered image recognition.
- Developed By: Developed by the Union Ministry of Agriculture and Farmers' Welfare under the Fund for Innovation and Technology (FIAT) of PMFBY.

Objectives of CROPIC:

- Real-time monitoring of crop growth stages and health.
- Early identification of crop stress and potential yield loss.
- Automated assessment for timely insurance claims under PMFBY.
- Build a crop image signature database for machine learning models.
- Promote digital transformation and resilience in agriculture.

How Will CROPIC Work?

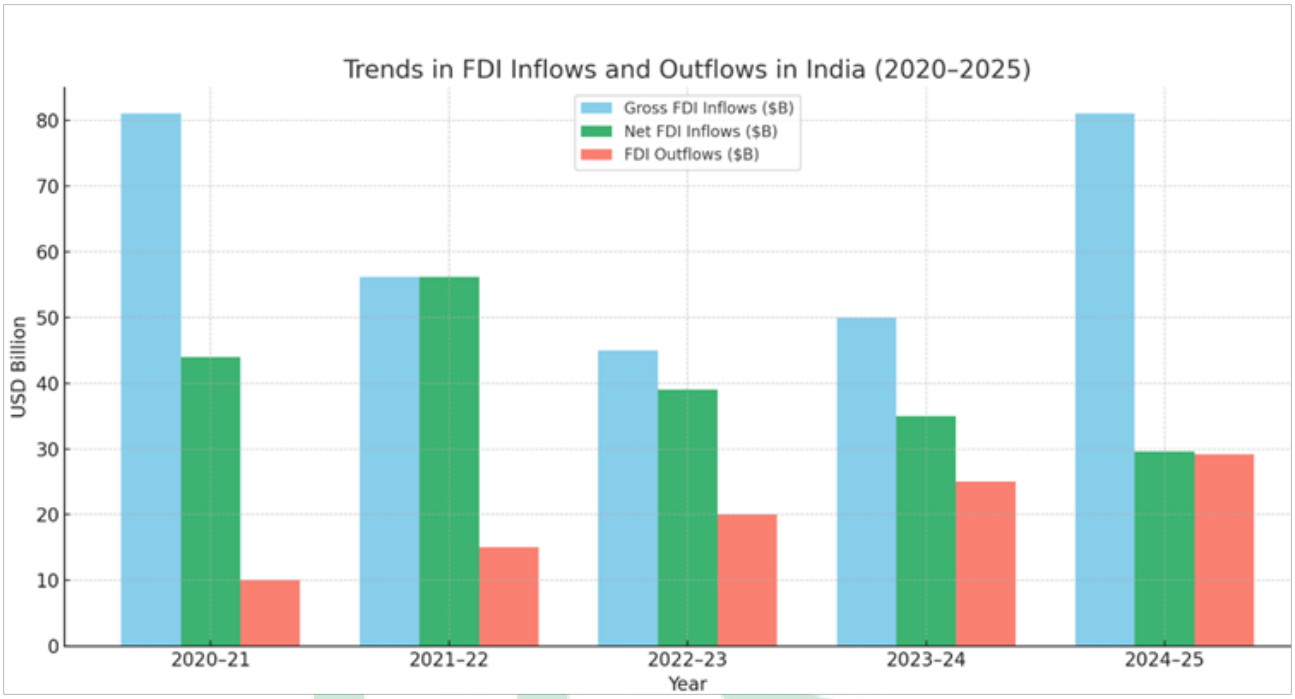
- Farmer-Driven Photo Upload: Farmers will upload crop images 4–5 times during the crop cycle using the CROPIC mobile app, ensuring real-time, ground-level data capture.
- AI-Based Image Analysis: These photos are processed through an AI cloud engine that uses computer vision to detect crop type, growth stage, stress signs, and possible damages.
- Diagnostic Output Generation: The model generates precise diagnostics including crop condition, stage, stress indicators, and severity of loss based on visual markers.
- Web-Based Dashboard for Officials: A centralised digital dashboard displays analysed data for district/state-level officials to track crop health and emerging risks.
- Support for Insurance Claim Validation: The analysed images serve as verifiable evidence to aid fast, transparent, and automated processing of PMFBY compensation claims.

Key Features of CROPIC:

- Crowdsourced Data Collection: Data is sourced directly from farmers through mobile apps, ensuring local participation and wider coverage of farm-level realities.
- Photo-Analytics Engine with AI: The platform integrates machine learning and image recognition to identify disease, pest attacks, or yield-affecting anomalies.
- Dashboard for Visual Monitoring: Real-time analytics are mapped and visualised on a digital dashboard for authorities to intervene proactively.
- PMFBY Integration for Efficiency: The model links seamlessly with the Pradhan Mantri Fasal Bima Yojana to reduce human dependency and enable faster claim settlements.
- Pilot Coverage and Scalability: The initiative will initially cover 50 districts per season across different agro-climatic zones, focusing on 3 insured crops per district.

FDI Paradox: India's Investment Crossroads

Context:



The RBI's Annual Report 2024–25 shows gross FDI inflows rose by 13.7%, yet long-term net inflows have halved due to rising disinvestments. India's net FDI dropped to just $0.4 billion in 2024–25, down sharply from $44 billion in 2020–21.

About FDI Paradox: India's Investment Crossroads

What is FDI?

- Definition: Foreign Direct Investment (FDI) refers to investments made by foreign entities in Indian businesses or sectors, typically in equity or through joint ventures.

FDI Role in Indian Economy:

- Capital Access: It provides critical capital for infrastructure, startups, and industrial expansion.
- Technology Transfer: Brings in advanced technologies, R&D capabilities, and managerial expertise.
- Employment Generation: Helps create direct and indirect employment across sectors.
- Boost to Balance of Payments (BoP): Stable FDI inflows help reduce current account deficits and stabilize forex reserves.

Recent Trends in FDI Inflows (As per RBI 2024–25 Report)

1. Sluggish Long-Term Growth: Despite a 13.7% increase in gross inflows in 2024–25, average annual growth was only 0.3% in the last four years.
2. Rising Disinvestments: Repatriation surged at 18.9% annually post-pandemic, leading to net FDI halving to $29.6 billion.
3. Distorted Composition: Significant flows from Singapore (15%) and Mauritius (close to 10%) suggest dominance of financial flows over productive investments.
4. Manufacturing Decline: Share of FDI in manufacturing dropped to 12%, down from peak levels.
5. Outward FDI Boom: Indian FDI outflows rose to $29.2 billion in 2024–25, almost tripling in five years.

Issues Surrounding FDI in India

1. High Repatriation Rate: Disinvestments now account for 63.5% of gross FDI, up from <1% in early 2000s.
2. Short-Term Financial Flows: Surge in private equity/VC investments focuses on profit, not production.
3. Sectoral Imbalance: Productive sectors like manufacturing and computer services are witnessing withdrawal.
4. Geographic Shift: Decline in investments from tech leaders like the US, Germany, UK reduces innovation value.

5. Data Discrepancy: UNCTAD figures are up to 60% lower than RBI estimates, indicating inflated official figures.

Way Ahead:

1. Improve Policy Stability: Ensure consistent and transparent FDI policies to build long-term investor trust.
2. Focus on Quality FDI: Encourage inflows in manufacturing, green tech, and R&D, avoiding passive capital.
3. Boost Domestic Reforms: Labour, land, and ease-of-doing-business reforms must align with investor needs.
4. Rationalize Tax Treaties: Reevaluate tax incentives to limit round-tripping via financial centres.
5. Strengthen Investment Monitoring: Create a robust mechanism to track real sectoral contribution of FDI.

Conclusion:

India's FDI landscape shows worrying signs of capital flight and low-quality inflows, raising structural concerns. Despite short-term growth, long-term investment stability is threatened by disinvestment surges and sectoral decline. Policymakers must pivot to reform-driven, high-quality FDI attraction to sustain economic resilience.

RBI New Draft Rules for Gold Loans

Context:

The Reserve Bank of India released new draft rules for gold loans to address rising defaults and standardize lending practices.

About RBI New Draft Rules for Gold Loans:

What is it?

- The RBI's draft guidelines aim to regulate and harmonize gold loan practices across banks and NBFCs, enhance borrower protection, and reduce the risk of asset loss due to over-leveraging.

Key Features of the Draft Guidelines:

Permitted Collateral:

- Loans only allowed against gold jewellery and bank-issued coins.
- Primary gold like bars, ingots, bullion cannot be used as collateral.

Loan-to-Value (LTV) Cap:

- LTV ratio capped at 75% of gold's assessed value.
- For bullet repayment loans, interest must be included in LTV, reducing the loan disbursed.

Collateral Valuation Norms:

- Gold must be assayed by qualified personnel with the borrower present.
- Value must be based on 22-carat price, adjusted if purity is lower.
- Use the lower of 30-day average or previous day's gold price.

Ownership Proof:

- Borrowers must declare ownership or furnish original purchase bills.
- Loans cannot be granted on jewellery with uncertain ownership.

Loan Caps and Limits:

- Max 1 kg of gold or 50 gm coins per borrower allowed as collateral.
- No concurrent loans on the same collateral for both consumption and business use.

Purpose-based Monitoring:

- Consumption loans must follow stricter tenure norms (max 12 months).
- Business-purpose loans must be evaluated based on cash flow, not collateral value.

Renewal and Repledge Restrictions:

- Fresh loans allowed only after full repayment of principal and interest.
- Lenders must return gold within 7 working days or pay 5,000/day compensation.

Why Did RBI Propose These Changes?

- Rising Gold Loan NPAs: NPAs from gold loans surged to 2,040 crore for banks and 4,784 crore for NBFCs (2024 data).
- Regulatory Gaps: Lack of uniform standards in valuation, lending, and loan tracking.
- Market Growth Pressure: Over 100% YoY growth in gold loan portfolios created systemic concerns.
- Borrower Protection: To avoid loss of household gold, often emotionally and culturally significant.

Implications:

For Lenders:

- Increased compliance and monitoring burden.
- May impact NBFC liquidity and growth, especially smaller ones.

For Borrowers:

- Could restrict easy access to credit, particularly in rural and semi-urban areas.
- Push for differentiated rules for small loans vs. high-value gold loans.

India Green Economy Potential

Context:

A recent NLB Services report forecasts that India will generate 7.29 million green jobs by FY28 and 35 million by 2047.

About India Green Economy Potential:

What is the Green Economy?

- A green economy refers to economic activities that reduce environmental risks, improve ecological sustainability, and generate employment through low-carbon, resource-efficient, and inclusive growth.

Key Highlights from the Report

Green Jobs Projection:

- India is expected to generate 7.29 million green jobs by FY 2027–28.
- The total number of green jobs could reach 35 million by 2047.

Green Economy Value Forecast:

- The green economy is projected to reach a value of $1 trillion by 2030.
- By 2070, it could grow to $15 trillion, supporting India's net-zero ambitions.

Potential Trends in Employment

- Tier II and Tier III Cities: These are projected to generate 35–40% of the green jobs by FY28, especially in sectors like sustainable agriculture, logistics, and warehousing.

Evolving Skill Requirements:

- Increasing demand for hands-on green technology skills.
- Growing need for digital literacy, especially in AI, Blockchain, and IoT applications.
- Strong focus on industry-academia partnerships to align curricula with sustainability and climate goals.

Operation Spider's Web

Context:

Ukraine executed Operation Spider's Web, its largest drone offensive, destroying $7 billion worth of Russian aircraft.

About Operation Spider's Web:

What is Operation Spider's Web?

- Operation Spider's Web is a high-precision, long-range drone operation launched by Ukraine targeting Russian airbases deep within enemy territory.

Nations Involved:

- Ukraine: Executing the offensive through its military and intelligence agencies.
- Russia: The target of the drone assault, which affected strategic airpower assets.

Objective:

- To cripple Russia's strategic bomber fleet, especially aircraft capable of launching cruise missiles and nuclear payloads.
- To showcase deep-strike capability and shift tactical momentum ahead of peace negotiations.

Key Features of Operation Spider's Web:

- Scale: Planned over 18 months by the Security Service of Ukraine (SBU).

Drone Deployment:

- 117 explosive-laden drones launched.
- Aircraft types hit: Tu-95, Tu-160, Tu-22M bombers and A-50 early-warning planes.

Tactical Innovation:

- Drones were concealed in wooden sheds on civilian trucks—a tactic likened to the Trojan Horse.
- Drones were remotely launched after being placed near airbases across multiple Russian time zones.
- Airbases attacked: Belaya (Irkutsk), Olenya (Murmansk), Dyagilevo (Ryazan), Ivanovo Severny, and Ukrainka.

Timing and Symbolism:

- Launched just hours after Russia's deadly Iskander missile strike on Dnipropetrovsk.
- Acted as a prelude to peace talks, strengthening Ukraine's bargaining power.

India's Textile and Apparel Industry

Context:

A recent analysis highlighted India's stagnant global apparel trade share (3%), stressing the urgent need for policy innovation to achieve the $40 billion export target by 2030.

About India's Textile and Apparel Industry:

- Sector Overview: A heritage industry employing over 45 million, contributing 2.3% to GDP, and 12% of manufacturing employment.
- Export Status: India holds only 4.2% share in global T&A trade ($37.8 bn out of $897.8 bn); apparel alone is at 3%.
- MSME Dominance: Over 80% of apparel units are small, fragmented enterprises lacking integration and global scale.

Importance of Textile and Apparel Industry:

- Mass Employment Generator: Employs over 45 million people, making it the second-largest employer after agriculture.
- E.g. Major source of livelihood in states like Tamil Nadu, Gujarat, and West Bengal.
- High Value Addition: From raw cotton to readymade garments, it adds value across every stage of the supply chain.
- E.g. Apparel exports fetch higher returns than raw textile exports.
- Export Potential: Contributes ~$37.8 billion to global trade, with high potential to expand India's share in global markets.
- E.g. India's target is $40 billion in apparel exports by 2030.
- Supports Ancillary Sectors: Boosts industries like dyes, chemicals, logistics, machinery, and retail.
- E.g. A 10% rise in garment output raises demand for spinning and processing units.
- Women-Centric Employment: Around 70% of workers in major apparel hubs are women, aiding gender-inclusive growth.
- E.g. Shahi Exports employs over 70,000 women across its factories.

Government Schemes (Textile & Apparel):

For Textiles:

- PM MITRA Parks: 7 integrated textile parks to boost competitiveness and reduce logistics costs.
- Amended TUFS: Technology Upgradation Fund Scheme incentivizing modernization in textile units.

For Apparel:

- RoSCTL Scheme: Refund of state and central taxes and levies on exports.
- SAMARTH: Focused skilling programme to train workers in textile/apparel operations.
- PLI Scheme for Textiles: Focus on MMF and technical textiles and PLI 2.0 draft proposes inclusion of large garment units.

Key Structural Bottlenecks:

- Fragmented Units: Over 80% are MSMEs with limited scale, reducing competitiveness and global visibility.

- High Capital Cost: India's 9% interest rate makes expansion costly vs. 3–4.5% in China/Vietnam.
- Rigid Labour Laws: Complex laws and high overtime costs (2x wage) deter formalisation and scaling.
- Supply Chain Inefficiencies: Dispersed production leads to longer delivery timelines and higher logistics costs.
- Low Female Workforce Participation: Despite high employment potential, FLFP in textiles remains underutilized.

Way Ahead:

- Subsidised Capital for Scale: 25–30% capex subsidy and 5–7-year tax holiday for units with 1,000+ machines.
- Flexible Labour Norms: Rationalize overtime payments (ILO standard: 1.25x), simplify compliance for formal hiring.
- Link MGNREGA with Wages: Use 25–30% funds to subsidize garment factory wages, ensuring employment and competitiveness.
- Designate MITRA Garment Hubs: Two parks in UP/MP can reduce migration, cut costs, and boost industrialization.
- Introduce Export-Linked Incentive (ELI): Shift from production-linked to export-linked schemes rewarding market competitiveness.

Conclusion:

India's apparel sector holds immense potential for job creation and export growth. But realizing the $40 billion goal needs bold reforms, scalable models, and policy precision. The success of Shahi Exports proves that scale is achievable — but only if replicated through enabling ecosystems.

16th Finance Commission

Context:

Shri T. Rabi Sankar, Deputy Governor of RBI, has been appointed as a part-time Member of the 16th Finance Commission (XVIFC) following the resignation of Shri Ajay Narayan Jha.

About 16th Finance Commission:

What is the Finance Commission?

- A constitutional body constituted under Article 280 of the Indian Constitution.
- It recommends the distribution of tax revenues between the Union and States and evaluates fiscal needs of local bodies.

Establishment and Tenure:

- The 16th Finance Commission (XVIFC) was set up on 31 December 2023.
- It is tasked with giving recommendations for the award period from 1 April 2026 to 31 March 2031.

Composition of 16th Finance Commission:

Member Name	Designation
Dr. Arvind Panagariya	Chairman, Former NITI Aayog Vice-Chairman
Dr. Manoj Panda	Full-time Member, Economist
Smt. Annie George Mathew	Full-time Member, Ex-Spl. Secretary, Finance
Dr. Soumya Kanti Ghosh	Full-time Member, Group Chief Economist, SBI
Shri T. Rabi Sankar	Part-time Member, Deputy Governor, RBI

Terms Of Reference for 16th Finance Commission:

- Distribution of Tax Revenues between Centre and States under Part XII of the Constitution.
- Principles for Grant-in-aid under Article 275 for revenue support (excluding specific purposes).
- Measures to augment State Consolidated Funds to support Panchayats and Municipalities, as per State Finance Commission's recommendations.

Administrative Details:

Qualifications for Members (As per Finance Commission Act, 1951):

Members must have:

1. Judicial or high court experience, or
2. Expertise in finance, economics, administration, or
3. Knowledge of government finance and accounts.

Disqualifications:

A person is disqualified if:

1. Of unsound mind, undischarged insolvent, or
2. Convicted of moral turpitude, or
3. Holds conflicting financial interests affecting impartiality.

Term of Office:

- Tenure as per Presidential notification and eligible for reappointment.
- Members can resign via letter to the President.

Powers And Functions:

- The Commission acts with civil court powers under Code of Civil Procedure, 1908, for: Summoning witnesses, requiring documents, requisitioning records, and seeking public authority cooperation.
- Can demand information from individuals and institutions relevant to its mandate.
- Has jurisdiction across India.

National Turmeric Board Inaugurated in Telangana

Context:

The Union Home Minister inaugurated the headquarters of the National Turmeric Board in Nizamabad, Telangana, fulfilling a 40-year-old demand of turmeric farmers.

About National Turmeric Board Inaugurated in Telangana:

What is it?

- A specialized statutory body set up by the Government of India to promote, regulate, and support the turmeric sector, from production to export.
- Headquarters: Nizamabad, Telangana – a key turmeric-producing region known as the "Turmeric Capital of India."
- Ministry Involved: Operates under the Ministry of Commerce and Industry with coordination from Ministry of AYUSH, Agriculture, Pharmaceuticals, and Cooperation.

Governing Body (Composition):

- Chairperson appointed by the Central Government
- Secretary from the Department of Commerce

Members from:

- Ministries of AYUSH, Agriculture, Commerce, Pharmaceuticals
- Representatives from top turmeric-producing states (Telangana, Maharashtra, Meghalaya)
- Turmeric farmer representatives, exporters, and research institutions

Objectives:

- Facilitate value addition, branding, and marketing of turmeric products
- Eliminate middlemen and enhance farmer income
- Promote global awareness of turmeric's medicinal properties
- Enhance logistics and quality standards to match international benchmarks
- Provide training, skill development, and research for turmeric cultivation and usage

Key Functions:

- Develop end-to-end export infrastructure for turmeric.
- Promote GI-tagged organic turmeric.
- Ensure compliance with international food and safety standards.
- Coordinate with Spices Board and cooperatives like National Cooperative Exports Limited and National Cooperative Exports Limited for turmeric exports.

About Status of Turmeric in India:

What is Turmeric?

- Turmeric (Curcuma longa) is a rhizomatous herbaceous plant known for its culinary, dyeing, and medicinal uses. It is called the "Golden Spice" and is central to Indian agriculture and

Regions Where It is Grown:

- Grown across 20+ Indian states.
- Major producers: Maharashtra, Telangana, Karnataka, Tamil Nadu, Andhra Pradesh, Meghalaya

Climatic Conditions Required:

- Tropical crop requiring 20–30°C temperature and high annual rainfall
- Grows in well-drained loamy soil
- Cultivation occurs in both rain-fed and irrigated areas

Production Overview:

- India produces over 75% of global turmeric, with 30+ indigenous varieties
- Area under cultivation (2022–23): 3.24 lakh hectares
- Production (2022–23): 11.61 lakh tonnes
- Export (2022–23): 1.53 lakh tonnes valued at USD 207.45 million
- Export Targets: USD 1 billion by 2030
- Major export destinations: Bangladesh, UAE, USA, Malaysia

Skills for the Future Report

Context:

Union Minister launched the "Skills for the Future: Transforming India's Workforce Landscape" report by the Institute for Competitiveness.

About Skills for the Future Report:

Importance of Skills in India's Development

- Demographic Dividend: India has one of the world's youngest populations. By 2047, skilling is crucial to convert this into productive human capital before ageing sets in.
- Economic Growth: Higher education boosts long-term GDP. A 1% rise in GER at tertiary level raises GDP by 0.511% (Parika, 2020).
- Employment Demand: India must create 5 lakh non-farm jobs annually till 2030 (Economic Survey 2023–24), needing skilled and job-ready workers.
- Global Competitiveness: To lead in EVs, AI, and green tech, India needs a workforce equipped for Industry 4.0 and sustainable sectors.

Key Findings from the Report:

1. Skill Level Distribution (PLFS 2023–24):

- 88% of India's workforce is in low-competency jobs (Skill Levels 1 & 2).
- Only 10–12% are in high-skill roles (Skill Levels 3 & 4).
- 9.76% of population has education beyond secondary level; 52.4% have only primary education.

2. Severe Skill Mismatch:

- Only 8.25% of graduates (Skill Level 3) work in matching roles.
- Over 50% of graduates are employed in lower-skill jobs (e.g., shopkeepers, operators).
- Overqualification is more prevalent than underqualification.

3. Low Penetration of TVET (Technical & Vocational Education & Training):

- Only 4.5% of the workforce has formal vocational training.
- TVET is often limited to Skill Level 2 roles; lacks alignment with modern industry needs.

4. Income Inequality by Skill Level:

- Skill Level 1 Avg. Wage: 98,835
- Skill Level 2 Avg. Wage: 1.26 lakh

- Skill Level 3 Avg. Wage: 2.81 lakh
- Skill Level 4 Avg. Wage: 3.94 lakh
- 46% of workforce earns less than 1 lakh annually.

5. Sectoral Skilling Concentration:

- Five sectors make up 66% of vocational enrolments: Electronics, IT/ITeS, Textiles & Apparel, Healthcare & Life Sciences, and Beauty & Wellness

6. Regional Skill Inequality:

- States like Bihar, Assam: 95% of workforce in low-skill roles.
- States like Kerala, Chandigarh have higher shares in Skill 3 & 4.
- Brain drains and migration are prominent in low-skill, low-growth regions.

7. Educational Transition Challenges:

- Transition from secondary to higher secondary level is weak: GER at higher secondary is only 57.56% (2021–22).
- GER at higher education remains below 30%, limiting pipeline to Skill Levels 3 and 4.

8. Sector-Specific Workforce Readiness Deficit:

- Many states show <5% workforce in Skill 3 roles.
- In IT, healthcare, and green jobs (EVs, biotech), India lacks skilled technicians, supervisors, and associate professionals.

Challenges Associated with Skilling in India:

- Skill-Education Mismatch: Overqualified youth work in low-skill jobs; underqualified workers fill skilled roles via informal pathways, reducing efficiency.
- Weak TVET-Industry Linkage: TVET programs are outdated and poorly aligned with digital, green, and advanced manufacturing sector needs.
- Informal Jobs & Wage Inequality: 46% of the workforce earns under 1 lakh/year; most low-skill jobs lack social security and upward mobility.
- Regional Imbalances & Migration: Skilling gaps in states like Bihar and UP fuel migration, burdening urban economies and worsening rural stagnation.
- Data & Access Gaps: Absence of real-time tracking, outcome-based metrics, and low skilling access for women, SC/STs, and rural youth.

Recommendations:

- Institutional Reforms: Launch a Skill Gap Survey and create a Central Skill Data Repository for real-time policy inputs.
- Curriculum Overhaul: Update NCO codes and align TVET content with modern tech and green economy job roles.
- TVET Revamp: Integrate vocational learning in schools, boost NAPS apprenticeships, and tie industry hiring to PMKVY certifications.
- Higher Education Push: Raise GER at higher secondary/tertiary levels; scale flexible, remote skilling for working populations.
- Inclusive, Targeted Skilling: Empower states through Skill Missions, prioritize women and SC/ST training, and focus on high-job-growth sectors like logistics and healthcare.

Conclusion:

A future-ready India hinges on bridging its skill gaps through inclusive, data-driven, and industry-aligned interventions. Skilling must evolve beyond education to enable meaningful employment and economic mobility. With focused reforms, India can transform its demographic potential into a global workforce advantage by 2047.

Sugamya Bharat App

Context:

The Sugamya Bharat App has been revamped with new AI features and an intuitive interface to improve accessibility support for persons with disabilities (Divyangjan) and senior citizens.

About Sugamya Bharat App:

What is it?

- Sugamya Bharat App is a crowdsourced mobile platform that allows users to report accessibility-related barriers in public infrastructure, transport, and ICT systems.
- Launched by: Department of Empowerment of Persons with Disabilities (DEPwD), under the Ministry of Social Justice and Empowerment.
- Launched in: 2021, as part of the broader Accessible India Campaign (Sugamya Bharat Abhiyan).
- Primary Objective: To enable citizens to report accessibility challenges, promote inclusive infrastructure, and strengthen citizen participation (Jan-Bhagidari) in building a barrier-free India.

Key Features of the Revamped App:

- User-Friendly Design: Intuitive navigation and simplified user experience for persons with disabilities and the elderly.
- AI-Powered Chatbot: Offers instant support and real-time information on various government schemes and initiatives for Divyangjan.
- Real-time Circulars and Notifications: Updates on latest policies, accessibility programs, and DEPwD announcements.

Complaint Redressal System:

- Citizens can upload geo-tagged photos to report non-accessible infrastructure.
- Out of 2,705 total complaints, 1,897 have been resolved till June 2025.

Digital Initiatives for Maritime Sector

Context:

The Union Minister of Ports, Shipping & Waterways launched a series of digital initiatives aimed at enhancing efficiency and sustainability in the maritime sector.

- Key projects include the SAGAR SETU platform, Digital Centre of Excellence (DCoE), DRISHTI Framework, and standardized Scale of Rates (SOR).

About Digital Initiatives for Maritime Sector:

What it is?

- A maritime digital push led by the Ministry of Ports, Shipping and Waterways (MoPSW) to modernize port infrastructure, logistics, and governance using emerging technologies.

Objective:

- Enhance port efficiency and trade ease.

- Enable data-driven governance.
- Support sustainability and clean energy goals.
- Align with Maritime India Vision 2030 and Amrit Kaal Vision 2047.

Key Digital Initiatives Launched:

1. Digital Centre of Excellence (DCoE):

- Partnership: MoPSW & Centre for Development of Advanced Computing.
- Purpose: Spearhead digital transformation in maritime logistics.

Features:

1. Uses AI, IoT, Blockchain for smart ports.

2. Focus on sustainable and green operations.

- Supports real-time port operation upgrades.

2. SAGAR SETU Platform:

- What it is: Unified EXIM digital interface.
- Integration: 80+ ports, 40+ stakeholders.

Goals:

1. Reduce paperwork and processing delays.
2. Promote seamless, transparent logistics.

- Aligns with PM Gati Shakti Master Plan.
- Impact: Boosts Ease of Doing Business (EoDB) and port productivity.

3. DRISHTI Framework:

- Full Form: Data-driven Review Institutional System for Tracking Implementation.
- Pillars: KPI Monitoring, Progress Tracking, Organisation Oversight, and Cell-wise Review
- Goal: Monitor Maritime India Vision 2030 projects in real time.

4. Scale of Rates (SOR) Template:

- What: Standardised tariff structure for major ports.
- Why: Reduces ambiguity, ensures transparency.

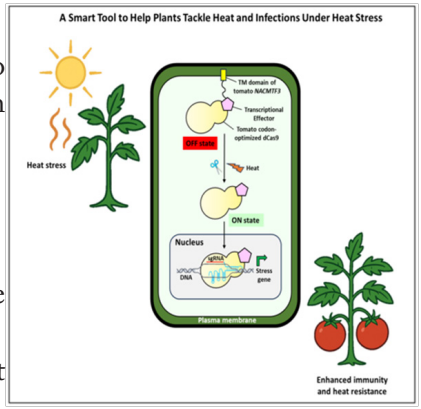
Benefit:

1. Digital comparison of tariffs.
2. Flexibility for local port adaptation.

- Investor and trader confidence boosted.

Modified CRISPR Tool to help plants combat heat stress

Context:



Scientists at Bose Institute, Kolkata, have developed a modified CRISPR tool to help plants combat heat stress and bacterial infections, offering a breakthrough in sustainable and smart agriculture.

About Modified CRISPR Tool to help plants combat heat stress:

What It Is?

- A modified CRISPR tool using dCas9 (dead Cas9) that acts as a gene switch, turning defense genes on or off without cutting DNA.
- The tool is designed to activate only under plant stress—such as heat waves or pathogen attack.
- Developed By: Bose Institute, an autonomous institution under the Department of Science and Technology (DST), Government of India.

How It Works?

- Scientists used a part of a natural tomato protein (called NACMTF3) to hold back the CRISPR switch (dCas9) outside the plant's control center (nucleus).
- When the plant faces stress like heat or disease, the hold is released, and the CRISPR switch moves inside the nucleus.
- Inside, it turns on helpful genes that help the plant fight heat and infections.
- This system saves energy, as it only works when the plant is in danger.

Key Features:

- Works only when needed: Genes are turned on only during heat or disease stress.
- Safe and natural: Uses a tomato protein, making it safe and eco-friendly.
- Activates helpful genes: Turns on CBP60g and SARD1 (to fight bacteria) and NAC2 and HSFA6b (to handle heat).
- Protects in two ways: Helps plants survive both heat and disease.
- No cutting of DNA: Unlike normal CRISPR, this version doesn't change the DNA, so it's safer for future use in farming.

Significance:

- Climate-resilient agriculture: Enhances plant survival during unpredictable weather, heatwaves, and microbial outbreaks.
- Smart input management: Plants utilize the tool only when needed, saving energy and improving productivity.
- Food security: Supports yield sustainability in key crops like tomato, potato, brinjal, and chilli.
- Global applicability: Has potential use across solanaceous crops worldwide, helping farmers adapt to climate stress.
- Research impact: Published in the International Journal of Biological Macromolecules, validating global scientific relevance.

NAVYA Initiative

Context:

The Government of India will launch 'NAVYA', a pilot initiative to skill adolescent girls, in Uttar Pradesh, under the Viksit Bharat@2047 Vision.

About NAVYA Initiative:

What is NAVYA?

- NAVYA stands for "Nurturing Aspirations through Vocational Training for Young Adolescent Girls." It is a new government pilot programme focused on skilling girls aged 16–18 years through vocational training.

Ministries Involved:

- Ministry of Women and Child Development (MWCD)
- Ministry of Skill Development and Entrepreneurship (MSDE)

Objectives:

- Empower adolescent girls with market-relevant vocational skills.
- Focus on non-traditional job roles to promote gender parity in new sectors.
- Build self-confidence, career aspirations, and economic independence among girls.

Key Features:

- Targets girls aged 16–18 with at least Class 10 qualification.
- Will be implemented in 27 districts (including Aspirational Districts and North-Eastern States) across 19 States.
- Leverages existing skill platforms like Pradhan Mantri Kaushal Vikas Yojana (PMKVY) and PM Vishwakarma Yojana.
- Institutionalised convergence between MWCD and MSDE for coordinated skilling efforts.
- Certification under PMKVY to enhance employability.
- Pilot launch events includes interactions with trainees and certificate distribution.

Significance:

- Bridges the gender gap in non-traditional skills and industries.
- Focuses on underserved regions and vulnerable groups.
- Contributes to women-led development under the Viksit Bharat@2047 Vision.
- Aligns with the goal of a self-reliant and inclusive India.
- Enhances participation of girls in economic growth and nation-building.

QS World University Rankings 2026

Context:

The QS World University Rankings 2026 were released, highlighting global trends in higher education quality and competitiveness; several Indian institutions showed notable improvements.

About QS World University Rankings 2026:

What it is?

- An annual global ranking of universities that evaluates academic performance, employability, sustainability, and global impact across higher education institutions.
- Launched by: Developed and published by Quacquarelli Symonds (QS), a global education services firm based in the UK.

Objective:

- To provide transparent insights into the global standing of universities.
- To guide students on university selection based on multiple performance indicators.
- To encourage universities to enhance research, teaching, internationalization, and impact.

Key Insights from QS World University Rankings 2026:

- India has 54 universities in the QS World University Rankings 2026, making it the fourth most represented country.
- Only the United States (192), the United Kingdom (90), and Mainland China (72) have more universities ranked than India.
- Eight Indian institutions have entered the rankings for the first time. This is the highest number of new entrants from any country this year.
- The number of Indian universities in the rankings has grown from 11 in 2015 to 54 in 2026. This marks a five-fold increase in just over a decade.
- 48 percent of India's ranked universities improved their positions compared to the previous year.
- Six Indian institutions feature in the global top 250.
- IIT Delhi leads the Indian contingent. It is ranked 123rd globally, rising from 150th in 2025.
- IIT Madras recorded one of the biggest jumps, rising 47 places from 227 in 2025 to 180 in 2026.
- A total of 12 Indian Institutes of Technology (IITs) feature in the list, highlighting their strong presence in global academia.

Gyan Post Service

Context:

India Post launched the 'Gyan Post' service to deliver educational books and socio-cultural literature at affordable rates across India.

- The initiative supports the vision of 'Har Ghar Gyan, Har Sapne Ko Udaan'.

About Gyan Post Service:

What is Gyan Post?

- Gyan Post is a postal delivery service introduced by the Department of Posts under the Ministry of Communications to deliver non-commercial educational and socio-cultural material at subsidized rates.

Objectives:

- Promote inclusive access to educational content across rural and urban India.
- Support students and competitive exam aspirants by ensuring low-cost, last-mile connectivity.
- Encourage dissemination of cultural and religious literature aligned with Indian laws.

How It Works?

- Operates through surface transport (road or rail) to keep costs minimal.
- Parcels must be marked "Gyan Post" and are subject to inspection by postal officials.
- Items are booked at post office counters only (retail, not bulk).
- Tracking is enabled, with optional add-ons like Proof of Delivery and Insurance.

Key Features:

- Only printed educational, social, religious, or cultural content is permitted.
- Magazines, advertisements, or commercial publications are excluded.
- Each book must carry the printer/publisher's name and be free of promotional content.
- Packaging must allow for easy inspection (unsealed envelopes or open wrapping).
- No personal communication or handwritten letters are allowed inside.

Eligibility Criteria:

- Materials must be from recognized boards, universities, or statutory institutions.
- Content should be legally compliant and used for academic or cultural purposes only.
- Sender must mention the receiver's and sender's full address with PIN codes.
- Books should not be periodically issued like journals or weeklies.

Weight & Dimension Limits:

- Minimum Weight: 300 grams
- Maximum Weight: 5 kilograms
- Allowed in both roll and non-roll formats within defined dimension tolerances.
- Pricing: The pricing structure used in Gyan Post is called a slab-based pricing model or weight-based tiered pricing.

International Organization for Marine Aids to Navigation (IALA)

Context:

India participated in the 2nd Session of the IALA Council in Nice, France, as the Vice President of the organization.

- India also invited members for the 3rd General Assembly (2025) and 21st IALA Conference (2027) in Mumbai.

About International Organization for Marine Aids to Navigation (IALA):

What is IALA?

- IALA is an intergovernmental technical body responsible for standardizing and enhancing marine aids to navigation (AtoN) to ensure maritime safety and efficiency globally.
- Established in: 1957 as a non-governmental body and became an intergovernmental organization in 2021.
- Headquarters: Saint-Germain-en-Laye, near Paris, France.

India's Role & Term:

- India is a Council member since 1980 and was elected Vice President during the 1st General Assembly in Singapore (2023).
- India's tenure as Vice President (2023–2027) marks its rising maritime stature and technical leadership.

Objectives of IALA:

- To develop international standards and technical guidance for marine navigation aids.
- To promote safety of navigation, protection of the marine environment, and global harmonization of practices.
- To support capacity building in member states through training, technology sharing, and advisory services.

Functions & India's Contributions:

- Standardization of Navigation Aids: Sets global norms for buoys, beacons, lighthouses, and Vessel Traffic Services (VTS).
- Technological Innovation: Works on IoT-enabled navigation, Maritime Service Registry, and digital AtoN development.
- Training and Capacity Building: India's Kolkata Marine Navigation Training Institute will host global training sessions.
- Heritage Conservation: Focuses on preservation of historical lighthouses, aligned with India's own lighthouse tourism mission.
- Hosting Global Maritime Events: India will host the 3rd General Assembly (2025) and 21st IALA Conference (2027) in Mumbai, underlining its global maritime leadership.

Lokpal of India

Context:

The Full Bench of the Lokpal of India adopted a new motto: "Empower Citizens, Expose Corruption".

- The new motto replaces the older one as part of efforts to enhance institutional visibility and public outreach.

About Lokpal of India:

What is it?

- The Lokpal of India is an independent statutory body established under the Lokpal and Lokayuktas Act, 2013 to inquire into allegations of corruption against public functionaries.
- Establishment: The Act came into effect on 16th January 2014, after decades of legislative deliberation and public demand for a central anti-corruption
- Headquarters: Located at Vasant Kunj, New Delhi.

Motto:

- Old Motto: Ma Gridhah Kasyasvid Dhanam (Do not be greedy for anyone's wealth)
- New Motto: "Empower Citizens, Expose Corruption"

Composition:

- One Chairperson (former CJI or Supreme Court Judge).
- Up to 8 Members (4 Judicial + 4 non-judicial).
- Appointed by the President based on recommendations from a high-level Selection Committee.

Jurisdiction:

- Can investigate complaints against:
- Prime Minister, Ministers, MPs
- Group A–D central government employees
- Officials of bodies partially/fully funded by the Government of India
- Individuals or entities receiving foreign contributions (above 1 crore/year)

Functions & Powers:

- Inquire into corruption cases under the Prevention of Corruption Act, 1988.
- Authorised to sanction prosecution, attach property, and recommend suspension or transfer of officials.
- Can summon witnesses, seize documents, and exercise civil court powers.
- Supervises CBI in cases it refers for investigation.
- Engages with other government agencies for inquiry and enforcement.

Lokmata Devi Ahilyabai Holkar

Context:

Prime Minister of India addressed the Mahila Sashaktikaran Mahasammelan on the 300th birth anniversary of Lokmata Devi Ahilyabai Holkar in Bhopal, Madhya Pradesh.

About Lokmata Devi Ahilyabai Holkar:

- Born: 31 May 1725, Chondi village, Ahmednagar (Maharashtra).
- Father: Mankoji Rao Shinde, village head who educated her.
- Married: Khanderao Holkar, son of Malhar Rao Holkar of the Malwa kingdom.
- Became ruler of Malwa in 1767 after approval from the Peshwa.

Kingdom and Reign:

- Ruled over the Malwa region, capital at Maheshwar (Madhya Pradesh).
- Known for wise, just, and inclusive governance during politically volatile times.
- Personally led military campaigns and founded the Holkar army in 1792.

Administrative & Governance:

- Held daily public audiences to address people's grievances.
- Introduced public welfare reforms focusing on: Farmers, Artisans, and Tribal communities.
- Promoted irrigation, crop diversity, and rural entrepreneurship.

Cultural & Religious Contributions:

- Rebuilt and restored hundreds of temples, including: Kashi Vishwanath Temple (1780) and Somnath Temple (Old Juna Mandir).
- Commissioned ghats, tanks, wells, and dharamshalas across India.
- Built two Jyotirlinga temples and extended religious support nationally.

Social Reforms & Women Empowerment:

Advocated:

- Raising minimum age of marriage for girls
- Property rights for women
- Widow remarriage
- Formed women's army and village-level safety units.

Nation-Building Initiatives:

- Constructed roads and rest houses across pilgrimage routes: Rameshwaram, Haridwar, Kashi, Somnath
- Established gurukuls and schools to promote education.

Legacy:

- Died: 13 August 1795, aged 70.
- Founded the Maheshwari saree textile industry, still famous today.
- Known as the 'Philosopher Queen' for her wisdom and spiritual outlook.
- Remembered for combining development with dharma (duty).
- Her work continues to influence India's cultural preservation and grassroots governance.

Seva Se Seekhen Campaign

Context:

Youth volunteers will begin their 15-day engagement at Jan Aushadhi Kendras under the Government of India's Seva Se Seekhen campaign.

About Seva Se Seekhen Campaign:

What is It?

- A youth engagement and hands-on learning campaign designed to involve young citizens in public service environments like Jan Aushadhi Kendras (JAKs).
- Launched In: Introduced in 2025, as part of India's National Youth Development Framework.

Nodal Ministries:

- Ministry of Youth Affairs and Sports
- Department of Pharmaceuticals, Ministry of Chemicals and Fertilizers

Objectives:

- Foster experiential learning by placing youth in service environments.
- Enhance public health awareness and generic medicine outreach.
- Develop soft and technical skills related to inventory, logistics, and community service.
- Encourage nation-building values like discipline, empathy, and grassroots engagement.

Key Features:

Nationwide Deployment:

- Five youth volunteers per district, embedded in five Jan Aushadhi Kendras each.
- Total outreach expected across all Indian states and UTs.
- Target Groups: Volunteers drawn from MY Bharat, NSS, pharmacy colleges, and other youth platforms.

Roles and Activities:

- Supporting day-to-day operations and customer service.
- Promoting generic medicine literacy.
- Learning inventory, stock, and logistics management.
- Engaging in community health awareness campaigns.
- Duration: 15-day structured internship with guided tasks and observations.

International Conference on Disaster Resilient Infrastructure (ICDRI) 2025

Context:

Prime Minister of India addressed the International Conference on Disaster Resilient Infrastructure (ICDRI) 2025, held for the first time in Europe.

About Coalition for Disaster Resilient Infrastructure:

What It Is?

- CDRI is a global multilateral platform launched by India in 2019 to promote infrastructure resilience against climate and disaster risks.
- Headquarters: Located in New Delhi.

Membership:

- 46 member countries and 8 partner organizations.
- Includes national governments, UN agencies, multilateral banks, and private sector entities.

Objective:

- Mobilize investments to make infrastructure climate- and disaster-resilient by 2050.
- Improve environmental quality, livelihoods, and resilience for over 3 billion people.

Funding:

- Mainly voluntary contributions.
- India is the primary funder, supported by USA, UK, France, Japan, Germany, Australia, Canada, and World Bank.
- No mandatory financial commitment for members.

Functions:

- Facilitate global knowledge exchange, conduct research, promote capacity building, and aid in financing resilient infrastructure.
- Implement 10 thematic initiatives, including those for Small Island Developing States (SIDS), urban resilience, Africa, and critical infrastructure.

Key Highlights of ICDRI 2025:

- Theme of the Conference: "Shaping a Resilient Future for Coastal Regions"

India 5 Global Priorities at CDRI:

- Education & Skill Development: Integrate disaster resilience modules into higher education for a future-ready workforce.
- Global Digital Repository: Create a platform to share case studies, learnings, and rebuilding models post-disaster.
- Innovative Financing for Developing Nations: Ensure access to resilience funding, especially for vulnerable countries.
- Special Focus on SIDS: Recognize Small Island Developing States (SIDS) as Large Ocean Countries, and prioritize their unique climate challenges.
- Early Warning & Coordination Systems: Strengthen real-time alerts and last-mile communication to reduce disaster impacts.

Chapter-
8

INTERNATIONAL RELATION

India's Refusal to Sign SCO Draft Statement

Context:

Defence Minister refused to endorse the SCO joint statement during the Qingdao meet, objecting to the omission of India-specific terror concerns.

About Shanghai Cooperation Organisation (SCO):

What is it?

- The SCO is a Eurasian intergovernmental organisation focused on political, economic, security, and defence cooperation, particularly in Central and South Asia.
- Established in: Formally founded on 15 June 2001, evolving from the 1996 Shanghai Five initiative.
- Founding Members: China, Russia, Kazakhstan, Kyrgyzstan, Tajikistan, Uzbekistan.
- Current Members (2025): 10 countries — India, China, Russia, Pakistan, Kazakhstan, Kyrgyzstan, Tajikistan, Uzbekistan, Iran, and Belarus.

Objectives:

- Promote regional security, counter terrorism and extremism, resolve border issues, foster economic cooperation, and advocate for multipolarity in global governance.
- Governing Body: The Heads of State Council (HSC) and Regional Anti-Terrorist Structure (RATS) are key decision-making and security cooperation bodies.

India's Refusal to Sign SCO Draft Statement:

What Happened?

- India declined to sign the draft declaration at the SCO Defence Ministers' Meet in Qingdao, chaired by China.

Why India Refused?

- The draft excluded the Pahalgam terror attack while highlighting the Jaffar Express hijack in Pakistan.
- India sought balanced representation of terror threats from all member states, but one country (likely Pakistan) blocked the inclusion.

India's Stance:

- Defence Minister reiterated India's zero tolerance for terrorism, demanding accountability for state-sponsored terrorism and cross-border proxy groups like Lashkar-e-Taiba.

Significance of India's Action at SCO:

- Sends a Strong Diplomatic Signal: India's refusal reaffirms its non-negotiable stance on terrorism, even within a forum influenced by China and Pakistan.
- Assertive Multilateral Diplomacy: India disrupted consensus in a 10-member bloc, challenging the China-Pakistan narrative control within the SCO.
- Strategic Autonomy in Action: Aligns with India's policy of strategic assertiveness, as seen during Operation Sindoor and other post-Galwan diplomatic moves.
- Undermines Anti-India Propaganda: By refusing to accept a selective and biased joint statement, India weakens attempts to internationalize internal security matters through SCO platforms.
- Signals to Upcoming SCO Summit: This stand sets the tone for the SCO Heads of State Summit in Tianjin, where India will push for terrorism-centric reforms in RATS.

Conclusion:

India's SCO dissent underscores its unwavering red lines on terrorism in global diplomacy. It reflects a calculated assertion of strategic interests in a China-heavy regional bloc. As tensions evolve, India's multilateral diplomacy will continue shaping the regional security narrative.

India's New Challenge: China-led Trilateral Nexus

Context:

China recently hosted the first China-Pakistan-Bangladesh trilateral dialogue in Kunming, soon after a China-Pakistan-Afghanistan meet, signaling a strategic push to consolidate Beijing's influence in South Asia.

About India's New Challenge: China-led Trilateral Nexus:

What is the Nexus?

- The emerging China-Pakistan-Bangladesh and China-Pakistan-Afghanistan trilaterals are Beijing's strategic mechanism to expand its geopolitical leverage in South Asia.
- China drives the agenda and Pakistan gains strategic relevance; and Bangladesh & Afghanistan are pulled into China's orbit for political, economic, and connectivity influence.

Mutual Interests Behind the Trilateralism:

- China: Seeks to dilute India's influence, expand BRI projects, and use Pakistan to complicate India's neighbourhood strategy.
- Pakistan: Gains strategic cover and economic aid from China to counterbalance India, especially post-Islamabad's international isolation.
- Bangladesh & Afghanistan: Seek Chinese infrastructure investments and political assurances in a multipolar South Asia.

Historical Context & Evolution:

- 1962 Indo-China War Legacy: Post-1962, China backed Pakistan as a regional counterweight to India. This set the stage for long-term military and strategic convergence.
- Siliguri Strategy (1965): Pakistan attempted to isolate India by roping in Nepal, China, and East Pakistan to disrupt India's connectivity via the Siliguri Corridor — a concept now resurrected.
- Terror Shielding & UNSC Diplomacy: China has shielded Pakistan-based terror entities like Lashkar-e-Taiba at the UNSC, reinforcing strategic trust between the two.
- 2025 Escalations: In Operation Sindoor, Pakistan used Chinese drones and radars, and Beijing criticized India's counterstrike, reaffirming the alliance.

Implications of the Nexus

1. On India

- Security Threat Intensification: Trilateral setups give legitimacy to China-Pakistan coordination on cross-border terrorism (e.g., Pahalgam attack, 2025).
- Diplomatic Disruption: China's involvement complicates India's outreach in Bangladesh and Afghanistan, traditionally seen as Indian strategic depth.
- BRI Encroachment: Enhanced trilateralism strengthens BRI's southern flank, marginalizing India-led alternatives like BBIN or Chabahar route.

2. On South Asian Stability:

- Strategic Polarization: Smaller countries are forced to balance between India and China, risking long-term regional fragmentation.
- Proxy Conflict Risks: Pakistan may exploit Chinese backing to re-intensify state-sponsored terrorism, destabilizing regional peace.
- Undermining SAARC-Like Platforms: China's encroachment could render regional initiatives ineffective and externally influenced.

Way Ahead for India:

- Reassert Strategic Redlines: India must clearly communicate that any neighbour aligning against its sovereignty will face economic, political, and military consequences.
- Strengthen Regional Partnerships: Boost engagement through platforms like BIMSTEC, IORA, and IPRU, bypassing Chinese influence.
- Counter with Economic Diplomacy: Offer targeted investments, credit lines, and market access to South Asian nations to dilute Chinese influence.
- Expand Defence Engagement: India should deepen military ties with Bangladesh, Maldives, and

Afghanistan, showcasing credible alternatives to Chinese military aid.

- Narrative Building & Strategic Communication: Project India as a non-hegemonic, inclusive partner, countering Chinese propaganda in the region.

Conclusion:

The China-led trilateral nexus marks a shift in regional power play aimed at restraining India's strategic ascent. India must blend hard power, diplomacy, and economic leverage to prevent encirclement. Only a confident, proactive India can shape a secure and multipolar South Asian order free from coercive trilateralism.

Bangkok Conference on Civil Registration and Vital Statistics

Context:

Governments across Asia-Pacific, including India, adopted a resolution at the Third Ministerial Conference on Bangkok Conference on Civil Registration and Vital Statistics in Bangkok to achieve universal birth and death registration by 2030.

About Bangkok Conference on Civil Registration and Vital Statistics:

- What is Civil Registration and Vital Statistics (CRVS)?
- Definition: CRVS is the continuous, permanent, universal, and compulsory recording of key life events such as births, deaths, marriages, and divorces under legal frameworks.
- Lead Organisation: UN ESCAP (Economic and Social Commission for Asia and the Pacific).
- Goal: Achieve legal identity for all (SDG Target 16.9) and improve delivery of services and data governance.

Key Features of a Civil Registration System:

- Legal Identity Establishment: Registers births and deaths to provide ID documents, including birth/death certificates.
- Life-cycle Services: Enables access to healthcare, education, pensions, inheritance, etc.
- Vital Statistics Generation: Supports policymaking and disease surveillance (e.g., COVID-19 mortality tracking).
- Inclusive Approach: Covers marginalised populations, including orphans, single-parent children, surrogate births.
- Digital Integration: Adoption of online portals, Digilocker, and AI tools for secure and easy documentation.

Why a Systematic and Inclusive CRVS is Needed:

- Legal Identity for All: Globally, over 14 million children in Asia-Pacific alone remain unregistered by age one, denying them access to education, health services, and social protection.
- Tackling Generational Exclusion: In countries like Myanmar, Pakistan, and Nepal, vulnerable groups such

as migrants, ethnic minorities, and undocumented populations are often excluded, perpetuating cycles of statelessness.

- Weak Data Undermines SDGs: Incomplete civil registration distorts key indicators for SDG targets on maternal mortality, child health, and pension coverage, leading to flawed policy design and delivery.
- Barrier to Rights and Protections: Lack of a legal identity increases susceptibility to human trafficking, child marriage, and modern slavery—especially among girls and displaced populations.
- Public Health Blind spots: In countries with low death registration coverage (e.g., Afghanistan, Cambodia), epidemics like COVID-19 exposed the risks of weak mortality data for surveillance and response.

Key Challenges in Expanding CRVS Coverage:

- Geographical Isolation: Mountainous regions (e.g., Nepal, Bhutan) and small island nations face last-mile connectivity issues for registration.
- Death Certification Gaps: Many Southeast Asian countries lack robust verbal autopsy mechanisms, especially for deaths outside hospitals, hampering accurate cause-of-death reporting.
- Inter-Agency Fragmentation: Across the region, CRVS responsibilities are often split between health ministries, interior departments, and local governance bodies, reducing operational synergy.
- Digital Divide Risks: As countries digitize CRVS, low digital access in Laos, Papua New Guinea, and tribal areas of India risks excluding the most vulnerable.
- Cultural Norms & Stigma: In patriarchal societies, births outside wedlock or to surrogate mothers often go unregistered due to social stigma and weak legal protections.

Key Outcomes of the 2025 Bangkok Summit:

- Extension to 2030: CRVS Decade extended to align with the SDGs.
- Declaration Adopted: Renewed commitment to ensure 100% birth and death registration.
- Digital Reforms: Emphasis on AI-based tools, digitisation of records, and interoperability.
- Equity and Privacy: Focus on gender equity and data protection in CRVS systems.
- Regional Progress: Birth registration improved from 86% to 96% in India; 29 countries now register 90%+ births.

Way Ahead:

- Cross-border Interoperability: Build regional CRVS standards to track identities across nations—vital for migrants in ASEAN and SAARC.
- Last-mile Infrastructure Boost: Deploy mobile registration units in Pacific Islands, remote Himalayan regions, and conflict zones like Myanmar and Afghanistan.
- Inclusive Legal Reforms: Update CRVS laws to include refugees, LGBTQIA+ families, and surrogate/adopted children, following models in Thailand and the Philippines.
- Verbal Autopsy Rollout: Mandate WHO-based autopsy tools in nations with high home deaths (e.g., Bangladesh, Cambodia) for accurate mortality data.
- Privacy-first Architecture: Ensure encrypted, consent-based CRVS databases to safeguard personal identity—especially for women and minors.

Conclusion:

The Bangkok CRVS Summit 2025 marks a pivotal moment in advancing legal identity and inclusive governance across Asia-Pacific. With political will, digital innovation, and community participation, the vision of "getting everyone in the picture" by 2030 is not just a promise, but a reachable goal.

Reshaping West Asia Geopolitics

Context:

The latest Israel-Iran conflict and closure of the Strait of Hormuz are reshaping West Asia's energy and geopolitical landscape, with major implications for global markets and India's strategic interests.

About Reshaping West Asia Geopolitics:

What it is?

- A transformation in power dynamics, alliances, and energy politics in West Asia, triggered by the escalation of military conflict and shifting global energy trends.

Recent Events:

- Israel's strikes on Iranian nuclear sites: Israel launched targeted airstrikes on Iranian nuclear facilities, escalating regional tensions and provoking Iranian retaliation.
- Iran's robust retaliation with ballistic missile attacks: Iran responded with extensive missile strikes on Israeli military targets and infrastructure, signalling a new phase of direct conflict.
- Rising threat of a blockade of the Strait of Hormuz: Iran blocking this vital oil shipping route, through which ~20% of global oil passes, risking a global energy supply shock.
- Potential for oil embargoes and attacks on Gulf energy infrastructure: Fears grow over Iranian-backed militias attacking rival Gulf oil facilities or coordinated embargoes against Western powers.

Earlier Geopolitics in West Asia

- Dominated by Cold War rivalries and US-Soviet influence: Regional dynamics were shaped by superpower competition and alliances, often fuelling local conflicts.
- Oil diplomacy and the 1973 Arab oil embargo shaped global markets: The 1973 OPEC embargo demonstrated West Asia's power to influence global energy prices and political outcomes.
- Israel-Iran relations were covert but pragmatic post-1979: Despite public hostility, secretive arms deals and intelligence sharing occurred during the Iran-Iraq war.
- Regional instability driven by Iraq-Iran war, Gulf wars, Arab-Israeli conflict: West Asia faced decades of war and turmoil, keeping energy markets volatile and alliances fluid.

New Geopolitics in West Asia:

- Shift toward multi-polar alignments (BRICS, SCO, China-Russia-Gulf links): Emerging alliances reflect growing Gulf ties with China and Russia, diluting traditional US dominance.
- Decline in US influence, emergence of Gulf regional autonomy: Gulf nations increasingly chart independent foreign policies, seeking diversified partnerships.
- Weaponisation of energy supplies as geopolitical tool: Oil and gas flows are now used strategically, with threats of embargoes or supply disruptions to gain leverage.
- Rising importance of non-state actors (Iran-backed militias): Militias, proxies, and hybrid warfare shape regional conflicts, adding layers of instability.
- Fragile balances between Gulf monarchies, Iran, and Israel: Tense but pragmatic co-existence among regional players risks tipping into wider conflict.

Factors / Causes for New Geopolitics:

- Energy Transition Pressures: Though renewables grow, oil and gas remain crucial, prompting Gulf states to maximise control and profits.
- Military Escalation: Israel-Iran hostilities now threaten key maritime routes like Hormuz, destabilising global energy trade.
- Regional Realignments: Warming Iran-Gulf relations may reshape oil alliances and affect traditional bloc politics.
- US Strategic Shifts: Erratic US policies create uncertainty, encouraging regional powers to hedge their bets and seek new partners.
- Public Sentiment: Pro-Palestinian, anti-West sentiment forces Gulf rulers to balance domestic opinion with external alliances.

Implications on India

Positive

- Potential opportunities in diversified energy sourcing and strategic reserves building: India can use this crisis to expand energy partnerships and build buffer reserves for supply security.
- Space to play balancer role in BRICS, SCO diplomacy: India's non-aligned stance offers a platform to mediate and strengthen multilateral engagements.

Negative

- Possible disruption in oil/LNG supplies (40-50% of India's energy imports via Hormuz): Any blockade or supply cut through Hormuz will critically disrupt India's energy imports.
- Rising energy costs leads to inflationary pressures on Indian economy: Surging oil prices may trigger inflation, raising costs for transport, manufacturing, and food.
- Risk to Indian investments in Chabahar Port, INSTC, IMEC Corridor: Heightened conflict could derail India's key connectivity and trade initiatives in the region.
- Strain on India's balanced relations with both Israel and Iran: Growing polarisation forces India into difficult diplomatic choices, risking ties with either side.
- Possible erosion of remittance flows from Gulf nations: Regional instability may affect jobs and remittances from Gulf-based Indian workers, impacting household incomes.

Conclusion:

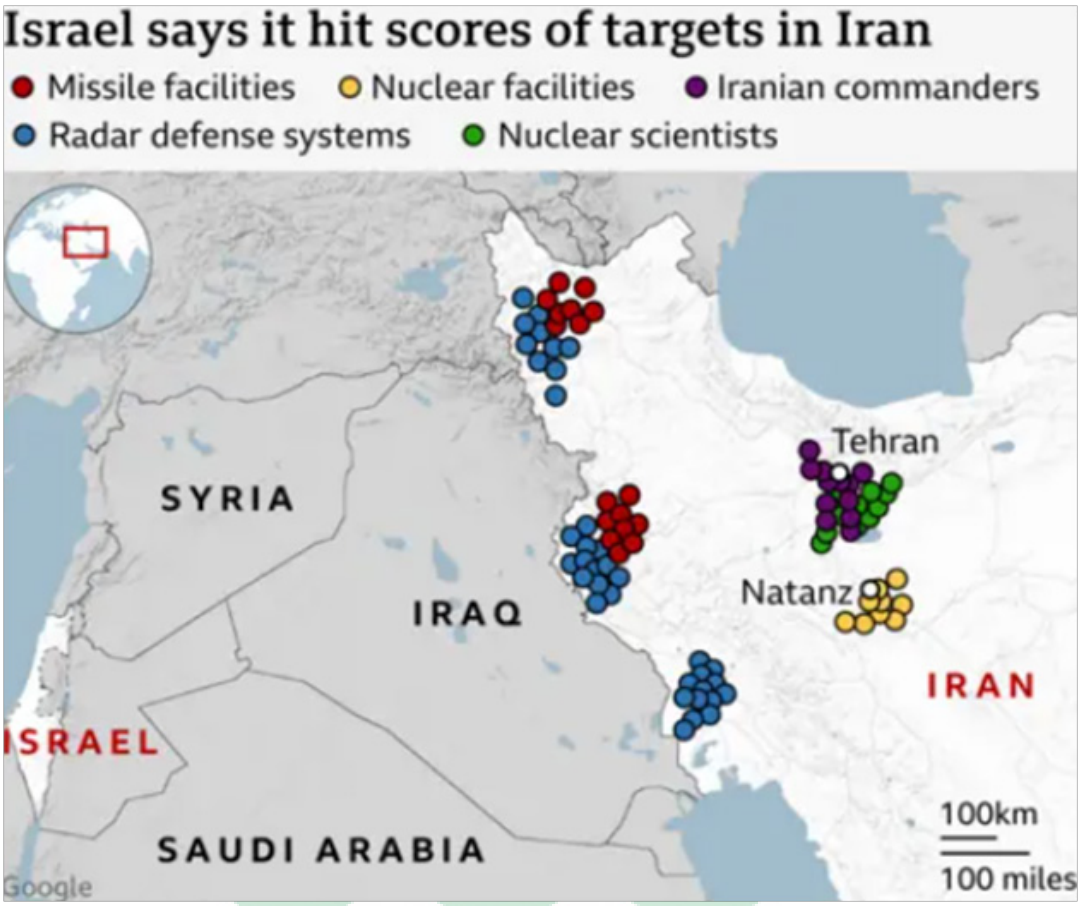
West Asia's fast-evolving geopolitical landscape demands that India adopt a pragmatic, flexible, and interest-driven approach. Balancing diplomacy, energy security, and economic interests will be crucial to safeguard India's strategic stakes in the region.

Israel Iran Conflict

Context:

Israel launched "Operation Rising Lion," a full-scale military strike on Iran targeting nuclear and missile infrastructure.

- This comes immediately after the IAEA declared Iran in violation of its nuclear safeguard's agreement.



About Israel Iran Conflict:

- Foundational Rivalry: Hostilities began after Iran's 1979 Islamic Revolution, which adopted a theocratic and anti-Israel stance.
- Proxy Network: Iran supports Hezbollah (Lebanon), Hamas (Gaza), Houthis (Yemen), and militias in Iraq to encircle Israel without direct confrontation.
- Past Israeli Strikes: Israel has previously struck nuclear facilities in Iraq (1981) and Syria (2007); Iran has remained a red line due to complexity.
- Abraham Accords Outcome: Iran's threat prompted Sunni Arab nations to normalize ties with Israel, sidelining the Palestine issue temporarily.
- October 7 Aftermath: Iran-backed Hamas' Gaza offensive intensified regional hostilities, drawing global attention to Iran's proxy warfare.

Causes Behind Recent Confrontation:

1. IAEA Resolution: The IAEA Board formally declared Iran non-compliant under the 1974 Safeguards Agreement after finding enriched uranium traces at unreported sites.
2. Nuclear Negotiation Breakdown: Talks between the US and Iran in Oman stalled over uranium enrichment disputes. Israel viewed this as a diplomatic loophole exploited by Tehran.
3. Military Escalation Logic: Israel believes targeting Iranian proxies is ineffective and has thus chosen to strike at their patron—Tehran.
4. Domestic Politics in Israel: PM Netanyahu, under political pressure, leveraged security threats to avoid elections and consolidate internal control.
5. Strategic Timing: Israel acted before the expiry of nuclear deal sanctions on October 18, potentially undermining Western diplomatic re-engagement.

IAEA Decision and Its Implications:

- Non-Compliance Declaration: The IAEA expressed "grave concern" over Iran's uranium traces and lack of transparency at Lavisan-Shian, Varamin, and Turquzabad.
- IAEA Statute Invoked: Under Article XII.C, this is the 7th time IAEA found a country non-compliant,

setting the stage for a UNSC escalation.

- Sanctions Risk: European powers may trigger snapback sanctions under the JCPOA, expiring in October.
- Iran's Reaction: Tehran denounced the resolution, threatened to exit the NPT, and initiated new deep-underground uranium enrichment projects.
- IAEA's August Report Awaited: IAEA chief Grossi will flag non-compliance in August if Iran remains evasive, intensifying global scrutiny.

Consequences of Israel-Iran Conflict:

Global Implications:

- Oil Price Shock: Escalation near the Strait of Hormuz (through which 20% of world oil flows) could destabilize global markets.
- US Strategic Dilemma: The US faces pressure to distance itself from Israeli actions while protecting its regional assets.
- Nuclear Proliferation Threat: Iran's exit from the NPT may trigger a nuclear arms race in West Asia.

Regional Impact:

- Destabilisation of Middle East: Countries like Iraq, Syria, and Lebanon may face intensified drone warfare and proxy escalations.
- Collapse of Peace Talks: Iran-US talks in Muscat and the two-state solution dialogues face an uncertain future.
- Rise of Armed Militias: Groups like PMF and Houthis may intensify retaliation against Israel or US bases.

Impact on India:

- Diaspora Risk: Nearly 8 million Indians reside in West Asia. War puts their safety and evacuation logistics at risk.
- Energy Dependency: Over 60% of India's crude imports pass through the Strait of Hormuz—supply disruptions threaten inflation.
- Diplomatic Balancing: India's ties with both Israel and Iran require delicate management amidst war rhetoric and sanctions.

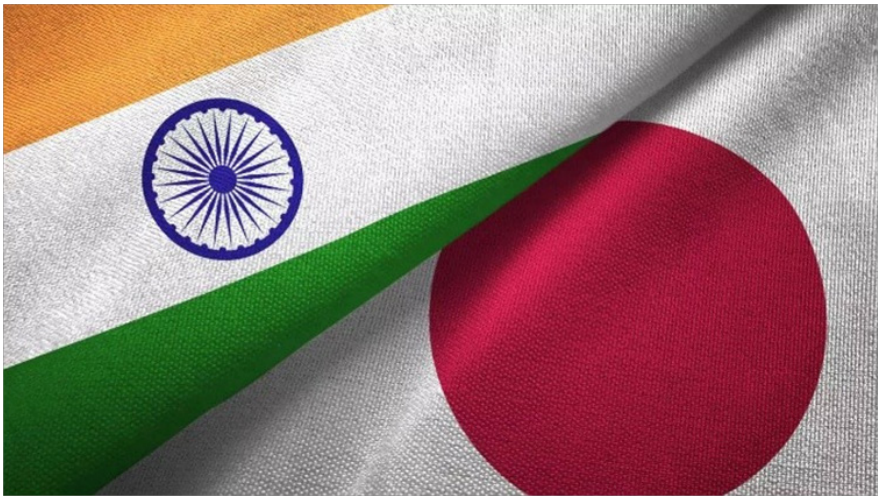
Conclusion:

The Israel-Iran conflict has reignited fears of full-scale war in an already volatile region. Diplomatic breakdown, proxy wars, and nuclear brinkmanship threaten global peace and economic stability. De-escalation and multilateral dialogue remain the only path forward to prevent irreversible damage.

India-Japan Maritime Relation

Context:

India and Japan have held high-level bilateral discussions to deepen cooperation in maritime affairs, including port digitisation, shipbuilding, and the employment of Indian seafarers, marking a new phase in strategic maritime collaboration.



Key Highlight about India-Japan Maritime Relation:

- Investment and Infrastructure: Japan showed interest in investing in Indian shipyards and port infrastructure, such as Imabari Shipbuilding's proposed greenfield project in Andhra Pradesh.
- Port Digitisation: Agreement on enhancing digital technologies in port operations to improve efficiency and reduce carbon emissions.
- Smart Islands Development: Japan to assist India in converting Andaman & Nicobar and Lakshadweep into smart, green islands using renewable energy and disaster-resilient systems.
- Employment and Training: Japan expressed interest in employing skilled Indian seafarers; India has over 1.54 lakh trained personnel available.
- R&D and Technology Transfer: Collaboration in next-gen ship design, sustainable maritime tech, and increased cooperation in research through Indian agencies and Cochin Shipyard Limited (CSL).

Over view of India-Japan Relations:

- Strategic Partnership: Both nations share the Indo-Pacific vision (Free and Open Indo-Pacific and Indo-Pacific Oceans Initiative), work under the Quadrilateral Security Dialogue and Supply Chain Resilience Initiative frameworks to counter China's dominance in the region.
- Economic Engagement: Bilateral trade was United States Dollar 21.96 billion in Financial Year 2022–23; target of five trillion-yen (Rs 3.2 lakh crore) investment by 2027.
- Infrastructure Development: Joint ventures in Mumbai-Ahmedabad Bullet Train and North-East development align with Japan's Partnership for Quality Infrastructure model.
- Energy and Technology Collaboration: Clean Energy Partnership (2022), civil nuclear agreement (2017), and Lunar Polar Exploration Mission with Indian Space Research Organisation and Japan Aerospace Exploration Agency.
- People-to-People Ties: Programmes like Technical Intern Training Programme and Specified Skilled Worker help India supply skilled manpower to Japan's aging economy.

Challenges in Bilateral Ties:

- Trade Imbalance: Comprehensive Economic Partnership Agreement has not yielded expected growth and India's exports remain low due to non-tariff barriers and strict standards.
- Foreign Direct Investment Limitations: Japan's total Foreign Direct Investment in India is still a small share of its global investment footprint.
- Geopolitical Divergences: Different approaches to China and Russia; Japan aligns more with United States strategy while India maintains strategic autonomy.
- Project Delays: High-speed rail and Asia-Africa Growth Corridor have faced slow implementation due to procedural bottlenecks.

Significance of the Maritime Agreement:

- Strategic Leverage: Enhances maritime security, strengthens port connectivity, and supports India's Indo-Pacific strategy.
- Green Shipping Push: Aligns with India's Maritime India Vision 2030 and Maritime Amrit Kaal Vision 2047 for carbon-neutral logistics.
- Employment Boost: Leverages India's large seafaring workforce and creates new skilled job avenues.
- Innovation and Technology Transfer: Fosters sustainable maritime innovation through Japanese technology and research and development partnerships.

Conclusion:

India-Japan maritime cooperation represents a convergence of economic, strategic, and environmental interests. As both nations navigate regional challenges, this partnership can serve as a model for Indo-Pacific collaboration. Strengthening maritime ties will be pivotal for a resilient and secure maritime future.

9 DISASTER MANAGEMENT

Banakacherla Project

Context:

A new inter-state water conflict has emerged between Telangana and Andhra Pradesh over the Banakacherla reservoir project, with Telangana alleging violation of the Andhra Pradesh Reorganisation Act, 2014.

About Banakacherla Project:

- The Banakacherla Reservoir Project is a proposed irrigation infrastructure by the Andhra Pradesh government aimed at diverting surplus Godavari River water to address drought conditions in Rayalaseema.

Location:

- Banakacherla, Nandyal district, Andhra Pradesh
- The project plans to channel water from the Godavari via the Krishna River system.
- States Involved: Andhra Pradesh (Project implementing state) and Telangana (Objecting state).

Project Features:

River Diversion Plan:

- Enhances the Polavaram Right Main Canal capacity (from 17,500 to 38,000 cusecs).
- Increases Thatipudi Lift Canal capacity (from 1,400 to 10,000 cusecs).
- Constructs a reservoir at Bollapalli to lift and channel water to Banakacherla via a tunnel through Nallamala forest.

Lift Points:

- Five major lift stations: Harischandrapuram, Lingapuram, Vyyandana, Gangireddypalem, and Nakirekallu.

Linking Rivers:

- Connects Godavari to Krishna to Penna, aiding water transfer to Rayalaseema.

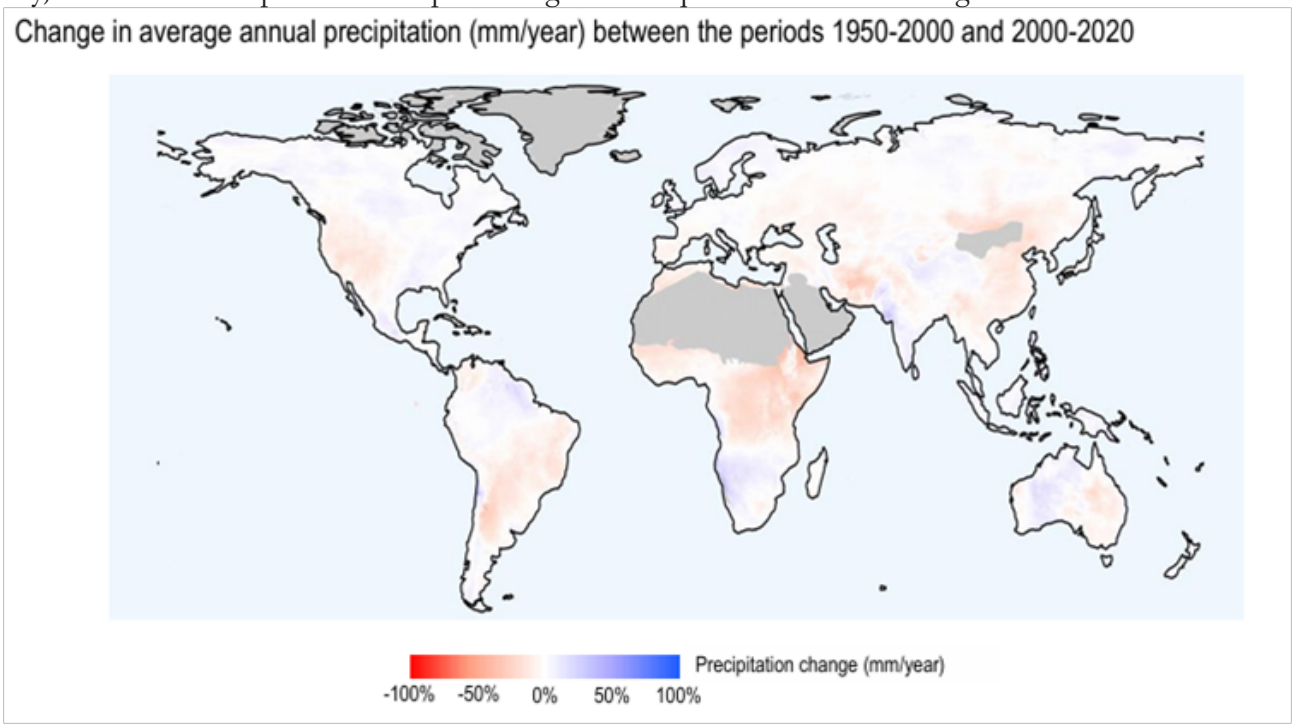
Key Issues Raised by Telangana:

- Violation of Reorganisation Act: Telangana claims the project violates the AP Reorganisation Act, 2014, which mandates prior approvals for such inter-basin projects.
- Lack of Regulatory Approvals: The project hasn't received clearance from the Krishna River Management Board (KRMB), Godavari River Management Board (GRMB), or the Central Water Commission (CWC).
- Godavari Tribunal Allocation Ignored: Telangana was allocated 968 TMCft out of 1,486 TMCft by the Godavari Water Disputes Tribunal, and surplus estimation hasn't been formalized.
- Threat to Telangana Projects: Telangana fears that diversion would impact its own irrigation schemes and reservoirs dependent on Godavari water.

Global Drought Outlook 2025

Context:

The OECD released its latest report "Global Drought Outlook 2025" warning of worsening drought impacts globally, with 40% of the planet now experiencing more frequent and intense droughts.



About Global Drought Outlook 2025:

- What it is: A global assessment of evolving drought trends, impacts, and adaptation policies.
- Published by: OECD — Global Drought Outlook: Trends, Impacts and Policies to Adapt to a Drier World, 2025.

What is Drought and Its Types:

- Definition: Drought is a hydrological imbalance — prolonged periods of "drier-than-normal" conditions affecting soil moisture, surface, and groundwater.

Types of Droughts:

- Meteorological Drought: Occurs when an area receives significantly below-average rainfall, leading to prolonged dry conditions.
- Agricultural Drought: Results when soil moisture becomes insufficient to meet the needs of crops and vegetation, affecting yields.
- Hydrological Drought: Arises when rivers, lakes, and groundwater levels decline below normal, impacting water supply for ecosystems and human use.

Trends in Drought Across the Globe:

- Affected Land: The share of global land exposed to drought has doubled since 1900, due to climate change and land use pressures.

- Current Impact: In 2023, nearly 48% of the world's land area faced at least one month of extreme drought, severely straining ecosystems and communities.
- Regional Hotspots: Persistent and severe droughts are increasingly common in the Western United States, South America, Europe, Africa, and Australia.
- Water Resources: Around 62% of monitored aquifers show declining trends, with major rivers experiencing reduced flow, threatening water security.
- Future Projections: If global warming reaches +4°C, droughts could become 7 times more frequent and severe by 2100, posing systemic global risks.

Impact of Drought:

Ecosystem:

- 37% of global soils show significant drying since 1980.
- Declining river flows, groundwater depletion.

Economic:

- Drought costs rising 3–7.5% annually.
- Average drought today is twice as costly as in 2000; 35% cost increase projected by 2035.
- Agriculture hit worst — crop yields can fall 22% in dry years.
- Trade & Energy: 40% reduction in fluvial trade, 25% decline in hydropower in severe drought.

Social:

- 34% of disaster-related deaths are drought-driven (only 6% of disasters are droughts).
- Major driver of hunger, displacement, and migration in Sub-Saharan Africa.
- Political instability and social unrest linked to resource scarcity.

Measures to Counter Drought:

- Integrated Water Resource Management: Efficient use, equitable allocation, restoring balance between withdrawal and renewal.
- Nature-based Solutions (NbS): Urban de-sealing, landscape restoration.
- Sustainable Agriculture: Drought-tolerant crops, efficient irrigation — can cut water use by up to 76%.
- Urban Planning: De-sealing cities restores aquifers (US examples show 780 mn m^3/yr recovery).
- Early Warning Systems: Better monitoring, risk mapping.
- Policy Integration: Embedding climate adaptation into water policies and land-use planning.
- Cross-Sector Collaboration: Involving energy, transport, construction, health sectors.
- Investment Returns: Every dollar spent on drought resilience yields 2x–10x benefits.

Conclusion:

As climate change escalates, droughts are no longer isolated events but global systemic risks affecting water, food, energy, and human security. The OECD urges nations to adopt proactive, integrated strategies to build resilience. Timely investment and cross-sector action can secure sustainable water futures for coming generations

Chapter-
10

INTERNAL SECURITY

NATO 5% GDP Defence Spending Target

Context:

NATO members, at The Hague Summit, is expected to adopt a new 5% GDP defence spending target amid rising security concerns from Russia's war in Ukraine.

About NATO's 5% GDP Defence Spending Target:

What it is?

- NATO countries will now aim to allocate 5% of their GDP on combined defence and security investments.

New Target Structure:

- 3.5% GDP for core military spending — personnel, equipment, operations.
- 1.5% GDP for broader security — cyber defence, infrastructure upgrades, energy protection.
- Existing Target: Earlier commitment (since 2014 Wales Summit): 2% of GDP for core defence and only 22 of 32 members met this by 2024.

About NATO (North Atlantic Treaty Organization):

What It Is?

- An intergovernmental military and political alliance, NATO ensures collective defence under Article 5—an attack on one is an attack on all.
- Established in: 1949 (North Atlantic Treaty, Washington D.C.)
- Headquarters: Brussels, Belgium
- Members: 32 countries from Europe and North America. Latest entrant:

Objectives:

- Collective Defence (Article 5): An attack on one is an attack on all.
- Crisis management and global peacekeeping.
- Cooperative security through political dialogue and partnerships.

History:

- Cold War Formation (1949): Created to counter Soviet expansion and ensure transatlantic security post-WWII through collective defence.
- Korean War Era: NATO strengthened political cohesion and military readiness during the Korean conflict, marking its early operational relevance.
- 1950s–60s Nuclear Doctrine: Adopted nuclear deterrence to balance Soviet conventional superiority.
- Post-Cold War (1990s): Shifted focus to crisis management and peacekeeping, notably in the Balkans and Kosovo.
- 21st Century: Took on broader roles in counter-terrorism (Afghanistan, 2001–2021) and global security partnerships beyond Europe.

Functions & Roles:

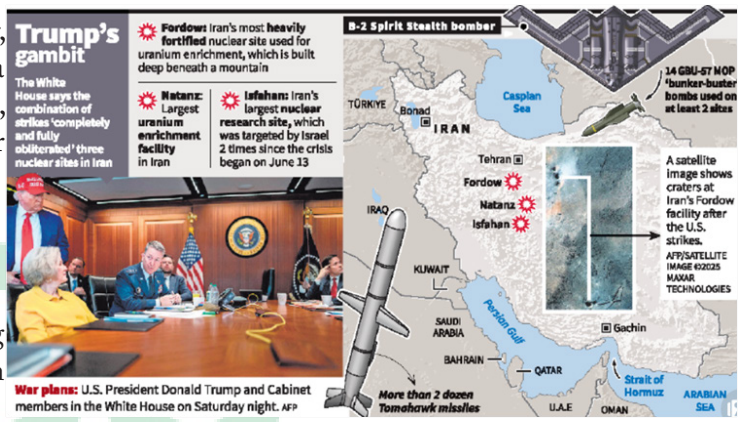
- North Atlantic Council: The alliance's top political decision-making body, meets regularly to set strategic priorities.

- Strategic Commands: Direct operational planning through Allied Command Operations (ACO) and Allied Command Transformation (ACT).
- Integrated Military Forces: Develops joint forces to ensure operational interoperability and swift crisis response.
- Cybersecurity: Coordinates NATO-wide cyber defence policies to counter hybrid threats and cyberattacks.
- Energy Security: Works on protecting critical infrastructure and ensuring energy resilience of member states.
- Counterterrorism: Leads intelligence-sharing, counter-radicalisation efforts, and military operations against terror groups.

Operation Midnight Hammer

Context:

The US launched Operation Midnight Hammer, deploying B-2 bombers and bunker-buster bombs in a precision strike on Iran's nuclear sites (Fordow, Natanz, Isfahan), claiming significant damage to Iran's nuclear infrastructure.



About Operation Midnight Hammer:

What it is?

- A classified US military airstrike targeting Iran's key nuclear facilities with precision weapons.
- Launched by: US Department of defence.
- Objective: To severely degrade Iran's nuclear weapons infrastructure and demonstrate US strategic air power.

Weapons used:

- B-2 Spirit stealth bombers with GBU-57A/B Massive Ordnance Penetrator (MOP).
- Tomahawk Land Attack Cruise Missiles launched from a US submarine.
- Decoy aircraft and support fighter jets for air defence suppression.

About US B-2 Spirit Stealth Bombers:

What it is?

- An advanced strategic stealth bomber of the US Air Force, capable of delivering both nuclear and conventional weapons with minimal radar detection.
- Developed by: Northrop Grumman during the late 1980s.

Key Features:

- Cost: $2.1 billion per unit (most expensive aircraft built)
- Range: Over 6,000 nautical miles without refueling (global reach)
- Payload: Over 40,000 lbs — can carry two GBU-57A/B "bunker-busters" or 16 B83 nuclear bombs
- Crew: Two pilots with advanced automation
- Stealth: Radar cross-section as small as a bird — evades advanced air defences

Weapons:

- Massive Ordnance Penetrator (MOP): 30,000 lbs, penetrates 200+ ft of reinforced concrete
- JDAM, JSOW, JASSM-ER for varied conventional strikes
- Nuclear capabilities for deterrence role in US nuclear triad

Significance:

- Demonstrates US global strike power and technological superiority.
- Capable of precision strikes on heavily fortified underground targets.
- Plays a vital role in deterrence, first-strike, and strategic military operations.

- Proven effectiveness across theatres: Afghanistan, Libya, Iran.

Fattah Hypersonic Missile

Context:

Iran deployed its Fattah hypersonic missile during recent strikes on Israel, showcasing its ability to bypass even advanced defence systems like Iron Dome, raising global security concerns.

About Fattah Hypersonic Missile:

What is it?

- Fattah is a medium-range hypersonic ballistic missile developed by Iran's Islamic Revolutionary Guard Corps (IRGC), designed to strike with precision and evade modern air defence systems.
- Developed In: November 2022, commemorating Hassan Tehrani Moghaddam
- Inducted: 2023 into IRGC's arsenal.

Key Features of Fattah Missile:

- Speed: Hypersonic—travels at Mach 13 to Mach 15 (up to ~15,000 km/h)
- Range: 1,400 km, with future upgrades planned to 2,000 km
- Manoeuvrability: Can shift direction mid-flight (up/down/left/right) to evade interceptors
- Stealth: Generates a plasma shield that reduces radar detection and jams radio signals
- Deployment: Actively used in Iran's 2025 strikes on Israel (Operation Honest Promise 3)
- Variants: Fattah-2 in development with extended range
- Other Global Hypersonic Missiles:

Country	Hypersonic Missile Systems
Russia	Avangard, Kinzhal
China	DF-17
India	BrahMos-II (under development)
USA	AGM-183 ARRW (under testing)
North Korea	Hwasong-8
Iran	Fattah-1 (operational), Fattah-2 (developing)

Operation Sindhu

Context:

The first flight under Operation Sindhu carrying 110 Indian students evacuated from Iran amid the escalating Iran-Israel conflict landed safely in New Delhi.

About Operation Sindhu:

What it is?

- Operation Sindhu is a government-led evacuation mission to safely bring back Indian nationals trapped in conflict-affected regions of Iran.

Launched By:

- Ministry of External Affairs (MEA), Government of India
- Supported by Indian Embassies in Iran and Armenia

Objectives:

- To ensure the safe evacuation of Indian citizens, especially students, from war-affected regions of Iran.
- To coordinate safe passage via Armenia due to volatile conditions inside Iran.

Key Features:

- Evacuation Route: From northern Iran to Yerevan, Armenia to New Delhi.
- Priority: Continuous monitoring by Indian Embassy and active coordination with host governments.
- Control Room: 24/7 MEA Control Room established in New Delhi for assistance.

Major Air Evacuation Missions by India:

Mission Name	Aim
Vande Bharat Mission	Evacuation of Indians stranded abroad during COVID-19 (2020)
Operation Devi Shakti	Evacuation from Afghanistan after Taliban takeover (2021)
Operation Ganga	Evacuation of Indians from Ukraine war zones (2022)
Operation Kaveri	Rescue of Indian citizens from Sudan conflict (2023)
Operation Ajay	Return of Indians from Israel during conflict (2023)
Operation Sindhu	Ongoing evacuation from war-hit Iran (2025)

Major Initiatives Launched at UN Ocean Conference 2025

Context:

At the recently concluded 3rd UN Ocean Conference (UNOC3) in Nice, key global initiatives such as One Ocean Finance and the High Ambition Coalition for a Quiet Ocean were launched to accelerate progress on SDG 14 — Life Below Water.

About Major Initiatives Launched at UN Ocean Conference 2025:

One Ocean Finance:

What it is?

- A global finance initiative to mobilise billions in sustainable funding for blue economy sectors and ocean restoration.
- Objective: To unlock new capital flows for industry transition, improve ocean health, and build resilient coastal communities.
- Launched by: A UN multi-agency coalition.
- Nations Involved: Open call for engagement not limited to formal member states.

Key Features:

- Designed as an inclusive, agile, scalable financing platform.
- Seeks to address the underfunding of SDG 14 (less than $10 billion vs $175 billion needed annually).
- Aims to channel funds through blended finance instruments to de-risk investments.
- Complements existing funds, aligns capital with marine ecosystem protection and community resilience.

High Ambition Coalition for a Quiet Ocean:

- What it is?
- A coalition of nations committed to reducing marine noise pollution and its harmful impacts on marine biodiversity.
- Objective: To tackle underwater noise pollution and enhance ecosystem resilience in global oceans.
- Launched by: Canada and Panama.
- Supported by 35 other nations.

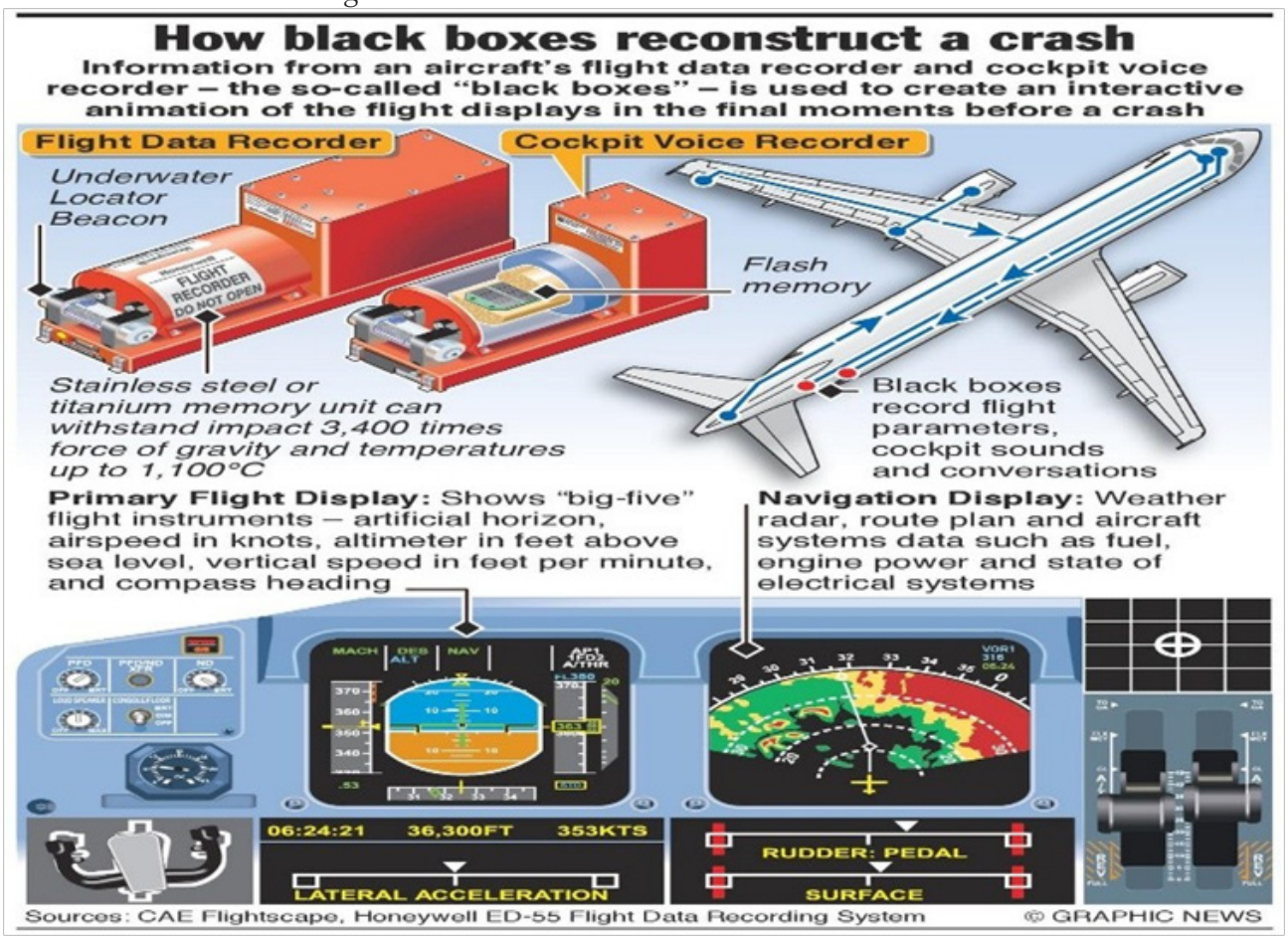
Key Features:

- Focuses on policy interventions to reduce human-generated noise in oceans.
- Promotes global cooperation to safeguard marine life from the growing impact of industrial activity.
- Builds on scientific recommendations from One Ocean Science Congress.

Black Box

Context:

The tragic crash of an Air India Boeing 787-8 Dreamliner in Ahmedabad has brought attention to the critical role of black boxes in aviation investigations.



About Black Box:

What is a Black Box?

- A Black Box refers to two key devices in an aircraft: the Cockpit Voice Recorder (CVR) and Flight Data Recorder (FDR).
- They record audio inside the cockpit and technical flight data respectively, offering investigators vital clues post-crash.

Historical Evolution:

- 1930s: François Hussenot of France devised early photographic film-based data recorders.
- 1953-54: Dr. David Warren in Australia invented the modern FDR after investigating unexplained air crashes.
- 1960: Use of FDR and CVR made mandatory in commercial aircraft.
- 1990: Solid-state memory replaced magnetic tapes, enhancing durability and data capacity.

How It Works?

- Cockpit Voice Recorder (CVR): Records pilot and co-pilot conversations, radio transmissions, alarms, and ambient sounds.
- Flight Data Recorder (FDR): Collects data on altitude, speed, engine performance, flight path, and over 3,500 parameters for up to 25 hours.

Materials & Protection:

- Housed in crash-protected metal casings using titanium or steel.

Designed to survive:

- Fires up to 1,100°C
- Explosions and G-force impacts
- 30 days of underwater immersion
- Emits locator beacons for search and recovery teams.

Why is a Black Box is orange colour?

- Despite the name, black boxes are bright orange with reflective strips for easy visibility at crash sites.
- The term "black box" comes from early film-based recorders stored in light-tight boxes, not from their colour.

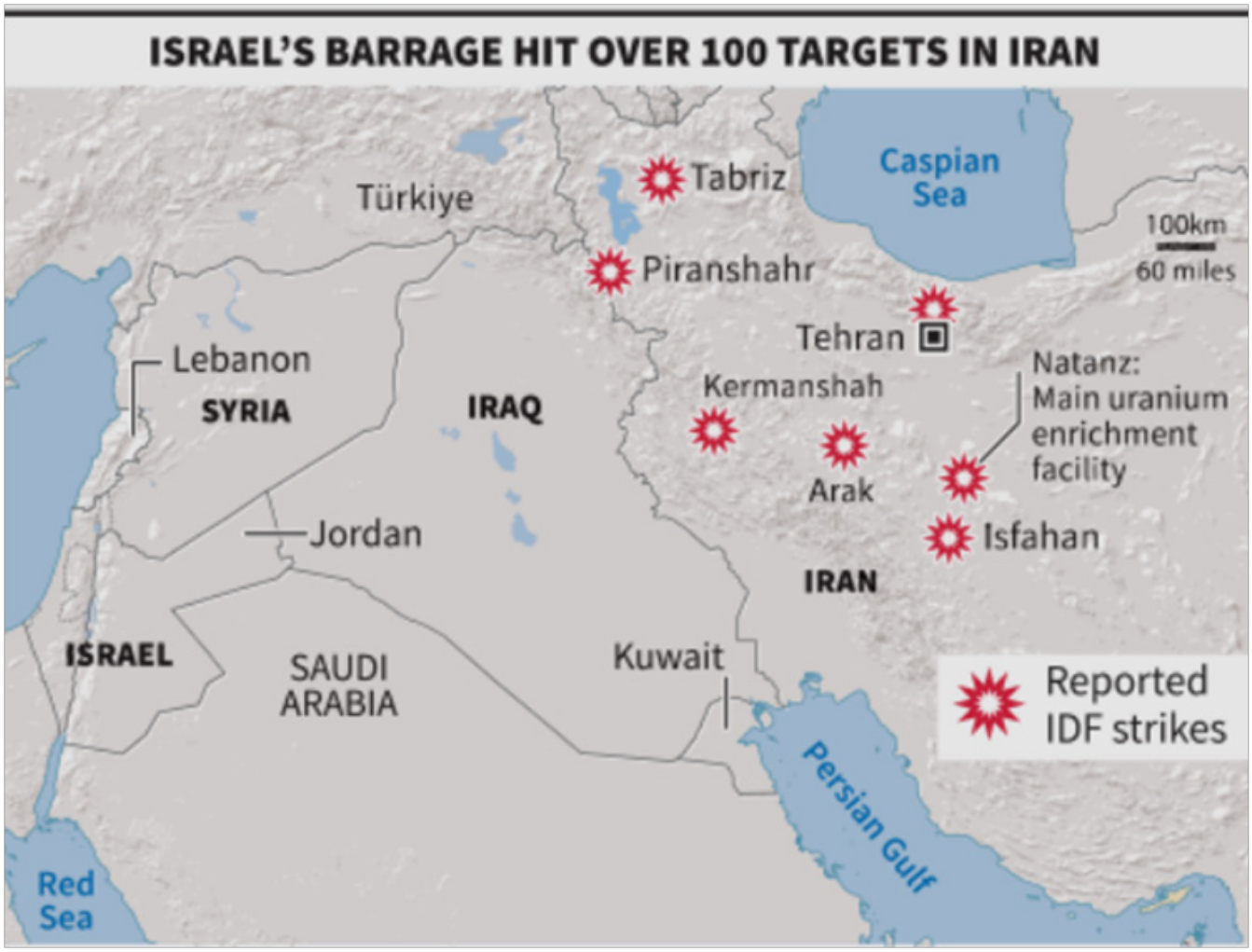
Modern Innovations:

- Combined Recorders: Merge CVR and FDR into a single unit to meet ICAO's 25-hour voice recording norm.
- Automatic Deployable Recorders: Eject from aircraft during crash and float on water, transmitting location via Emergency Locator Transmitter (ELT).
- Data Streaming via Satellites: Being explored to transmit real-time data and avoid loss in deep-sea crashes.

Operation Rising Lion

Context:

Israel launched 'Operation Rising Lion', a massive airstrike targeting Iran's nuclear facilities and top military personnel.



About Operation Rising Lion:

- Operation Rising Lion is a large-scale military airstrike campaign launched by Israel targeting Iran's nuclear and military infrastructure.
- Nations Involved: Israel and Iran

Reason Behind the Operation:

- In response to IAEA's report that Iran violated nuclear non-proliferation norms by secretly enriching uranium.
- Israel viewed Iran's nuclear advancement as an existential threat, prompting pre-emptive action to cripple its enrichment capabilities and eliminate senior military leadership.

Iran's Nuclear Sites in the News:

- Natanz Nuclear Facility (Isfahan Province):
- Iran's primary uranium enrichment centre, referred to as the "beating heart" of its nuclear programme.
- Severely damaged in Israel's strike, including major surface infrastructure.

Fordow Enrichment Plant (Qom Province):

- Located deep underground, this facility is critical for high-grade enrichment.
- Reported explosions suggest it was partially targeted in follow-up strikes.

Bid Kaneh Missile Complex:

- A key site for missile development and production.
- Hit by precision strikes targeting strategic deterrence capability.

Kermanshah Missile Base:

- Central hub for short and medium-range missile storage.
- Hit to restrict Iran's retaliation capabilities.
- Tabriz Military Bases & Research Centre: Targeted to cripple military command structures and destroy ballistic storage units.
- Tehran Command Centre: Underground base where Iran's IRGC air force leadership was meeting key commanders killed.

Passage Exercise (PASSEX)

Context:

The Indian Navy and UK Royal Navy conducted a Passage Exercise (PASSEX) in the North Arabian Sea.

About Passage Exercise (PASSEX):

What is PASSEX?

- PASSEX refers to joint naval drills conducted between friendly navies when they cross each other during deployments. It enhances interoperability, communication, and strategic cooperation at sea.
- Host Location: Conducted in the North Arabian Sea, a region of geostrategic importance for global maritime trade and security.

Participating Nations:

- India: INS Tabar (stealth frigate), a conventional submarine, and P-8I long-range maritime aircraft.
- United Kingdom: HMS Prince of Wales (aircraft carrier) and HMS Richmond (frigate) of the UK Carrier Strike Group.

Objectives of the Exercise:

- Strengthen interoperability between Indian and Royal Navies.

- Enhance anti-submarine warfare coordination.
- Conduct tactical manoeuvres and maritime domain awareness operations.
- Share professional expertise and operational best practices.
- Demonstrate mutual commitment to Indo-Pacific maritime security.

Key Features:

- Helicopter control drills and fleet movement: Enable precise coordination between ships and airborne units for swift multi-platform responses.
- Joint anti-submarine operations: Combine air, surface, and subsurface assets to boost submarine detection and tracking.
- Officer exchanges: Foster mutual trust and improve interoperability through shared naval experiences.
- Real-time tactical data sharing: Enhances situational awareness with live encrypted information across platforms.
- Communication protocol exercises: Test system compatibility for seamless coordination during joint missions.

Strategic Importance for India:

- Strengthens India's defence diplomacy in Indo-Pacific: Showcases India's naval reach and strategic alignment with key partners like the UK.
- Advances India-UK 2030 Roadmap goals: Deepens defence cooperation under the Comprehensive Strategic Partnership.
- Supports SAGAR vision: Promotes inclusive maritime security through collaborative regional engagement.

Taliban Sanctions Committee & 1373 Counter-Terrorism Committee

Context:

Pakistan has been appointed Chair of the 1988 Taliban Sanctions Committee and Vice Chair of the 1373 Counter-Terrorism Committee as part of its term as a non-permanent UNSC member (2025–26).

About 1988 Taliban Sanctions Committee (TSC):

What is it?

- A subsidiary body of the UNSC, the 1988 Committee monitors the implementation of sanctions specifically on Taliban-linked individuals and entities.
- Established in: 2011, under UNSC Resolution 1988, after separating from the broader 1267 Al-Qaeda Sanctions regime.
- Objective: To ensure compliance with travel bans, arms embargoes, and asset freezes targeting individuals affiliated with the Taliban who pose a threat to peace in Afghanistan.

Key Features:

- List-based regime covering ~130 individuals/entities.
- Chair has procedural control, including setting the agenda, consulting members, and presenting recommendations.
- Decisions are taken by consensus, limiting unilateral power.
- No powers to investigate or enforce and relies on state cooperation for implementation.
- Monitors compliance and considers listing, delisting, or exemption requests.

About the 1373 Counter-Terrorism Committee (CTC):

What is it?

- A technical committee created to implement UNSC Resolution 1373 following the 9/11 attacks, aimed at strengthening global legal and operational counter-terrorism efforts.
- Established in: 2001, under Chapter VII of the UN Charter, making its obligations binding on all UN member states.
- Objective: To compel states to criminalize terrorism, prevent terrorist financing, and deny safe havens to terrorists.

Key Features:

- Does not designate terrorists or groups (unlike 1267 Committee).
- Focuses on capacity building, legal reforms, and promoting best practices.
- Works with Counter-Terrorism Executive Directorate (CTED) for technical support and global assessments.
- Encourages international cooperation, border control, and financial surveillance.
- Operates under consensus model, limiting politicisation of actions.

Operation Spider's Web

Context:

Ukraine executed Operation Spider's Web, its largest drone offensive, destroying $7 billion worth of Russian aircraft.

About Operation Spider's Web:

What is Operation Spider's Web?

- Operation Spider's Web is a high-precision, long-range drone operation launched by Ukraine targeting Russian airbases deep within enemy territory.

Nations Involved:

- Ukraine: Executing the offensive through its military and intelligence agencies.
- Russia: The target of the drone assault, which affected strategic airpower assets.

Objective:

- To cripple Russia's strategic bomber fleet, especially aircraft capable of launching cruise missiles and nuclear payloads.
- To showcase deep-strike capability and shift tactical momentum ahead of peace negotiations.

Key Features of Operation Spider's Web:

- Scale: Planned over 18 months by the Security Service of Ukraine (SBU).

Drone Deployment:

- 117 explosive-laden drones launched.
- Aircraft types hit: Tu-95, Tu-160, Tu-22M bombers and A-50 early-warning planes.

Tactical Innovation:

- Drones were concealed in wooden sheds on civilian trucks—a tactic likened to the Trojan Horse.
- Drones were remotely launched after being placed near airbases across multiple Russian time zones.
- Airbases attacked: Belaya (Irkutsk), Olenya (Murmansk), Dyagilevo (Ryazan), Ivanovo Severny, and Ukrainka.

Timing and Symbolism:

- Launched just hours after Russia's deadly Iskander missile strike on Dnipropetrovsk.
- Acted as a prelude to peace talks, strengthening Ukraine's bargaining power.

India Energy Security

Context:

India's Petroleum Minister highlighted India's energy strategy, biofuel achievements, and green hydrogen push in an op-ed, as India became the 4th largest global economy in 2025 with $4.3 trillion GDP.

About India Energy Security:

Need for Energy Security in India:

- High Demand Growth: India is set to contribute 25% of global energy demand by 2047, necessitating assured, affordable, and clean energy access.
- Strategic Sovereignty: Energy sufficiency reduces dependence on volatile global markets and enhances national security.
- Development Imperative: With 6.7% growth in Q1 2025, uninterrupted energy is critical for sustaining infrastructure, manufacturing, and services expansion.
- Urban-Rural Linkage: Energy security ensures equitable development across states through city gas networks and rural LPG penetration.
- Global Commitments: India's net-zero goal by 2070 and INDCs require energy diversification and sustainable energy systems.

India's Multi-Pronged Energy Strategy:

- Diversification of Sources: Increased imports from new suppliers and promotion of domestic production to reduce oil dependency.
- Expansion of Exploration: OALP and DSF reforms doubled exploration coverage from 8% (2021) to 16% (2025), and targets 1 million sq km by 2030.
- Pricing Reforms: Gas linked to 10% of Indian crude basket, 20% premium for new wells enhances investment and urban gas access.
- Infrastructure Expansion: India now has 24,000 km of product pipelines and 96,000 fuel outlets, ONGC and Oil India added 75 MMtoe via new discoveries.
- Digital Governance: PM Gati Shakti digitally mapped 1 lakh+ energy assets; enabled cost savings of 169 crore via route optimization.

India's Focus on Green Energy:

- Ethanol Success: Blending rose from 1.5% (2013) to 19.7% (2025), saving 1.26 lakh crore in forex and paying 1.79 lakh crore to distillers.
- Green Hydrogen Push: 8.62 lakh tonnes tendered, IOCL awarded 10 KTPA plant at Panipat, and NRL to pioneer hydrogen in NE.
- Compressed Biogas: 100+ plants under SATAT, targets 5% blending by 2028 to reduce agri-waste and boost circular economy.
- Pipeline Growth: National gas pipeline spans 25,000 km and projected to hit 33,000 km by 2030.
- Hybrid Leases: 2024 amendment allows hydrocarbons and renewables on same oilfield, boosting low-carbon transitions.

Conclusion:

India's energy journey has shifted from anxiety to self-assurance. With strategic planning, infrastructure expansion, and green innovation, India is building a secure, sustainable energy future that aligns with its development goals and global climate pledges.

Exercise Nomadic Elephant 2025

Context:

India and Mongolia are conducting the 17th edition of the joint military exercise 'Nomadic Elephant 2025' in Ulaanbaatar, Mongolia from May 31 to June 13, 2025.

About Exercise Nomadic Elephant 2025:

- Type of Exercise: It is a joint military training between two countries – India and Mongolia.
- Current Edition: This is the 17th edition of the exercise, showing a long-term defence partnership.
- Location: The exercise is being held at the Special Forces Training Centre in Ulaanbaatar, the capital of Mongolia.
- Indian Participation: 45 soldiers from the Indian Army are taking part. They are mainly from the Arunachal Scouts, and a unit trained for mountain warfare.
- Key Features and Activities:
- Counterterrorism Training: Soldiers are practicing skills like sniper shooting, room clearing, and fighting in mountain and city-like areas.
- Peacekeeping Practice: The troops are preparing for situations where countries work together under the UN's command to maintain peace and help civilians in conflict zones.
- Cyber and Rock Warfare: Training includes basic cyber warfare awareness and climbing or survival skills in rough terrains like hills and rocks.
- Working Together Smoothly: The goal is to improve coordination and understanding between the two armies so they can act together quickly during emergencies.
- Cultural Bonding: Soldiers are also sharing cultural programs to build friendship and mutual respect between the two countries.

Chapter-
11

SOCIETY

Inclusive Education for Children with Disabilities

Context:

The Centre signed a tripartite MoU between DEPwD, NIOS, and NCERT to strengthen inclusive education for children with disabilities, focusing on curriculum reform, accessibility, and institutional partnerships.

About Inclusive Education for Children with Disabilities:

What it is?

- Inclusive education ensures that children with and without disabilities learn together in a common environment, supported by adapted curricula and teaching methods (RPWD Act, 2016).

Key Data Point:

- 7% of Indian children (0–19 yrs) have disabilities — Census 2011.
- Only 98% of enrolled primary students are children with disabilities — UDISE+ 2019-20.
- 21 lakh CWSN covered under Samagra Shiksha — 2018-19.
- 27,774 special/resource teachers available for CWSN support — Samagra Shiksha data

Need for Inclusive Education for Children with Disabilities:

- Right to Education: Article 21A and RTE Act 2009 guarantee free, compulsory education for all children aged 6–14, including CWSN — fulfilling constitutional and legal obligations.
- Equity & Inclusion: UNESCO reports 29 million out-of-school children in South Asia, many with disabilities — inclusion ensures no child is left behind.
- Breaking Social Barriers: Inclusive schooling reduces stigma, fosters empathy, and builds community acceptance toward persons with disabilities.
- Human Capital: Educating CWSN unlocks their potential, enabling them to become active contributors to economic growth and innovation.
- International Commitments: India's obligations under CRPD 2007, SDG 4, and NEP 2020 mandate inclusive, equitable, and quality education for CWSN.

Government Initiatives

- Tripartite MoU (2025): DEPwD-NIOS-NCERT signed MoU to adapt curriculum and recognise DDRS-run special schools as SAIEDs to expand academic options.
- NEP 2020: NEP 2020 integrates disability inclusion across all education levels, emphasising equity and universal access.
- Samagra Shiksha: Supports ₹3500/child/year, expanded girl stipend (Classes I–XII), special educators, resource rooms, and home-based education.
- Barkha Series: NCERT's "Barkha" UDL-based reading series provides accessible, inclusive learning material in print and digital formats.
- RPWD Act 2016: Mandates inclusive learning environments with accessible infrastructure and provision of assistive devices and support.
- Home-based Education: CWSN with severe disabilities can access tailored home-based education up to Class XII under Samagra Shiksha.

Challenges associated:

- Data Gaps: Current UDISE+ lacks detailed disability data by type/severity, hindering targeted interventions and resource planning.
- Infrastructure Deficit: Many schools lack ramps, accessible toilets, Braille resources, or inclusive TLM — limiting CWSN participation.
- Shortage of Trained Teachers: Nationwide, only ~27,700 special/resource teachers (2019) are available, far short of demand across all states.
- Low Enrolment: Less than 1% of children with disabilities are enrolled at primary level — reflecting systemic access gaps.
- Social Barriers: Stigma, lack of awareness, and parental reluctance continue to impede CWSN integration in regular schools.
- Inconsistent Implementation: Inclusion under NEP varies widely across states; lack of robust monitoring and accountability mechanisms.

Way Ahead:

- Improve Data: Incorporate Washington Group questions in UDISE+ for disaggregated, globally comparable disability data.
- Boost Funding: Achieve NEP's 6% of GDP target for education, with specific earmarked allocations for inclusion initiatives.
- Infrastructure Upgrade: Mandate 100% accessible infrastructure — classrooms, toilets, playgrounds — in all government and aided schools.
- Teacher Training: Integrate UDL and disability education into all B.Ed and in-service training to build teacher competency.
- Strengthen Monitoring: Develop and track clear, measurable SDG 4 inclusion indicators at national and state levels.
- Community Engagement: Encourage parent-teacher forums, partnerships with NGOs, and community-led sensitisation to promote inclusion.

Conclusion:

Inclusive education is pivotal to fulfilling India's constitutional vision of equality and dignity for all. The recent MoU and evolving frameworks like NEP 2020 signal progress, but addressing gaps in data, training, and community awareness is vital for meaningful change.

Performance Grading Index (PGI) 2.0 Report

Context:

The Ministry of Education released the Performance Grading Index (PGI) 2.0 report for 2022-23 and 2023-24, ranking States/UTs on school education.

- Chandigarh topped the index while Meghalaya was at the bottom.

Categories	Domain	Indicators	Total Weight
1. Outcomes	Learning Outcomes and Quality (LO)	12	240
	Access (A)	7	80
	Infrastructure & Facilities (IF)	15	190
	Equity (E)	16	260
2.Governance Management (GM)	Governance Processes (GP)	15	130
	Teacher Education & Training (TE&T)	8	100
Total		**73**	**1000**

About Performance Grading Index (PGI) 2.0 Report:

- What it is: An evidence-based assessment tool measuring the performance of school education across States/UTs.
- Launched in: 2017 and PGI 2.0 version aligned with NEP 2020 and SDGs.
- Published by: Ministry of Education, Govt of India.
- Domains Covered: 6 domains, 73 indicators — Learning Outcomes, Access, Infrastructure & Facilities, Equity, Governance Processes, and Teacher Education & Training.
- Grading Scale: Out of 1000 points, classified into 10 grades from Daksh (Top) to Akanshi-3 (Lowest).

Summary & Trends in Performance Grading Index (PGI) 2.0 Report:

- Top Rank: Chandigarh scored 703 points, achieving Prachesta-1, reflecting its strong performance in governance and infrastructure.
- Lowest Rank: Meghalaya scored 417 points (Akanshi-3), indicating persistent challenges in access and learning outcomes.
- No State in Top 4 Bands: No State/UT reached Daksh (Top 951-1000) or Utkarsh bands, showing systemic gaps needing national-level reforms.
- Overall Progress: 24 States/UTs improved in 2023-24, though 12 recorded a decline, signalling uneven progress.
- Infrastructure Gains: Delhi, J&K, Telangana showed top progress in upgrading school infrastructure and learning environments.
- Learning Outcomes: No State reached Daksh in this domain; reflects the long-standing issue of poor learning levels in foundational literacy and numeracy.
- Equity: Gaps in educational outcomes between SC/ST and general category students have narrowed slightly but remain an area of concern.
- Access Improvements: Bihar and Telangana showed highest gains in increasing enrolment and retention, especially among disadvantaged groups.

Analysis of PGI 2.0 Report:

Positive Trends:

- Wider Score Gains: 24 States/UTs improved scores in 2023-24, indicating systemic strengthening of school education post-pandemic disruptions.
- Access Excellence: Odisha achieved Daksh in Access, reflecting robust enrolment, retention, and efforts to minimise dropouts.
- Progressive Equity: PGI 2.0 shows gender parity improving across most States and gaps in enrolment and learning for SC/ST and minorities steadily narrowing.
- Infrastructure Upgradation: Delhi, J&K, Telangana demonstrated model progress in upgrading physical infrastructure (toilets, electricity, digital classrooms), vital for NEP 2020 goals.
- Access Improvements in Low Performers: Bihar, Telangana, Jharkhand moved up bands in Access, showing targeted interventions in under-served areas.
- Learning Outcomes Leadership: Chandigarh, Punjab, Puducherry ranked in higher bands of Learning Outcomes, highlighting that focused governance can yield quality improvements.
- Governance & Digital Monitoring: Progress seen in some UTs like Chandigarh in digitisation of school governance, UDISE+ adoption, transparent fund utilisation.

Negative Trends:

- No State in Top Bands: No State/UT reached Daksh or Utkarsh (761+ scores) — underscoring that quality of education lags behind infrastructure and access gains.
- Persistent Learning Gaps: Outcomes in NAS 2021 reveal low proficiency in foundational literacy & numeracy across most States — urgent challenge for NEP 2020.
- High Inter-State Variability: Score gap of ~286 points between Chandigarh (703) and Meghalaya (417) shows deep regional disparities in school education quality.
- Declining Performance in 12 States: Bihar, Karnataka, West Bengal, Andaman Nicobar, Ladakh among States where PGI scores fell — suggests weak post-pandemic recovery in some regions.
- Infrastructure Deficits in Aspirational States: Many low-performing States still report lack of functional toilets, boundary walls, libraries, labs — critical to both equity and learning.

Way Ahead:

- Address Learning Gaps: Urgent need to improve Learning Outcomes — foundational literacy & numeracy as per NEP 2020 goals.
- Accelerate Access: Sustain progress on Access and focus on retaining vulnerable and marginalised children.
- Strengthen Governance: Enhance monitoring & governance capacity to ensure effective policy implementation.
- Improve Infrastructure: Priority to upgrade labs, libraries, toilets, digital classrooms across low-performing States.
- Build Equity: Continue efforts on gender, caste, and rural-urban equity to ensure inclusive quality education.

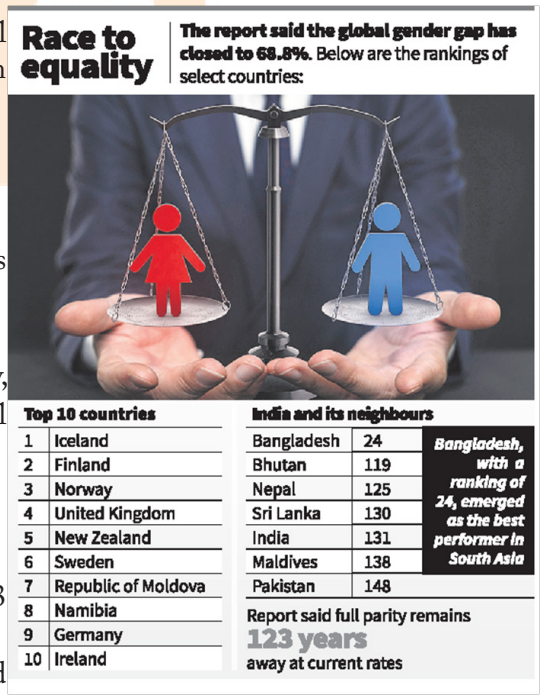
Conclusion:

PGI 2.0 is a robust benchmarking tool aligned with NEP 2020. While progress is evident, India must intensify efforts to address learning gaps, governance bottlenecks, and infrastructure inequalities to meet SDG 4 by 2030

Global Gender Gap Report 2025

Context:

India slipped to 131st position out of 148 countries in the Global Gender Gap Report 2025, released by the World Economic Forum (WEF), highlighting persistent challenges in gender equality.



About Global Gender Gap Report 2025:

What It Is?

- An annual report that benchmarks gender parity across countries, helping track progress toward closing gender gaps.
- Published By: World Economic Forum (WEF)
- Assessment Criteria: Economic Participation and Opportunity, Educational Attainment, Health and Survival, and Political Empowerment.

Features:

- 19th edition covering 148 economies
- Global gender gap closed to 68.8%, but full parity still 123 years away
- Aims to inform policy by highlighting both progress and setbacks
- Uses a parity score (0–100%) to reflect gender equality across sectors

About India's Status in Global Gender Gap Report 2025:

Current Rank:

- 131st out of 148 countries (slipped from 129th in 2024)
- Parity Score: 64.1% (among the lowest in South Asia)

Positives:

- Economic Participation improved by 0.9 points to 40.7%, with earned income parity rising to 29.9%
- Educational Attainment score reached 97.1%, driven by improved female literacy and tertiary enrolment
- Health and Survival showed gains due to better sex ratio at birth and healthy life expectancy

Negatives:

- Political Empowerment fell for the second consecutive year
- Female MPs dropped from 14.7% to 13.8%
- Women ministers fell from 6.5% to 5.6%
- Overall gender parity worsened, with declining representation in public leadership roles

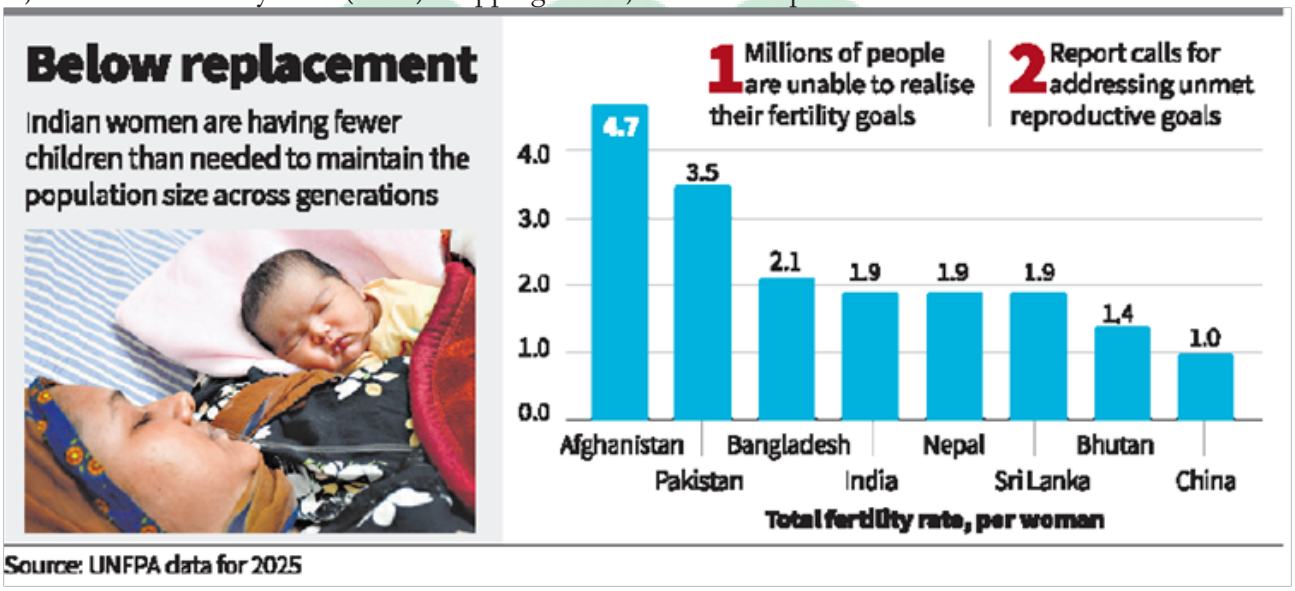
Regional Comparison:

- Bangladesh: Best in South Asia, ranked 24th globally
- Other Neighbours: Nepal (125), Sri Lanka (130), Bhutan (119), Maldives (138), Pakistan (148 – last)

State of the World Population 2025 Report

Context:

India's population has reached 146.39 crore in April 2025 as per the UNFPA's "State of the World Population 2025" report, with Total Fertility Rate (TFR) dropping to 1.9, below the replacement level of 2.1.



Key Highlights of UNFPA State of the World Population 2025:

1. Global Population Trends: World population stands at 8.2 billion; growth has slowed but disparities remain between high-income and low-income countries.
2. Fertility Crisis Redefined: The real crisis is unmet fertility goals—not just overpopulation or underpopulation, but denial of reproductive choice.
3. Reproductive Agency: Emphasis on individual rights to decide freely on reproduction, contraception, and timing of childbirth.
4. Demographic Dividend: Over 60% of the world's population is in the 15–64 age group, offering a productivity window.
5. Ageing Population Concern: Global elderly population (65+) is growing rapidly, requiring focused health and pension reforms.
6. Youth Bulge in LMICs: Low- and middle-income countries (like India, Nigeria) have large youth populations with untapped potential.
7. Gender & Fertility Gaps: Women's education and autonomy significantly influence fertility patterns and gaps persist in access to healthcare & contraception.

What is Fertility and Its Features?

- Definition: Fertility refers to the actual number of children born to a woman during her reproductive years (15–49 years).
- Total Fertility Rate (TFR): Measures average births per woman and 2.1 is considered the replacement level.
- Determinants: Influenced by education, health access, family planning services, cultural norms, and economic conditions.

Global Issues Surrounding Fertility:

1. Falling Fertility in Developed Countries: Countries like Japan, Italy, and South Korea face declining TFRs, below 1.5, triggering ageing concerns.
2. High Fertility in Fragile States: Sub-Saharan Africa has TFRs above 4, stressing healthcare, education, and resources.
3. Reproductive Inequality: Millions lack access to contraception, maternal care, and autonomy in reproductive choices.

India's Status as per the 2025 Report:

- Population Size: India leads with 146.39 crore, expected to peak at 170 crores in 40 years before stabilizing.
- TFR Status: Current TFR is 1.9, below replacement level, indicating a demographic transition.

Demographic Composition:

- Youth (0–14): 24%
- Teens (10–19): 17%
- Working age (15–64): 68%
- Elderly (65+): 7%
- Life Expectancy (2025): Men – 71 years; Women – 74 years.
- Unrealized Fertility: A section of the population cannot achieve desired fertility goals due to poor access to services.

Way Ahead:

1. Census Completion (2027): A fresh census is vital to revise socio-economic and fertility-related policies.
2. Strengthen Reproductive Health: Enhance access to family planning, maternal care, and education for women.
3. Elderly & Youth Policy Balance: Craft policies that balance between ageing population welfare and youth skill development.

Conclusion:

India stands at a pivotal moment demographically. With a TFR below replacement level and a large working-age population, the focus must shift from mere numbers to ensuring quality of life, reproductive rights, and preparedness for the demographic future.

Urban Drainage Crisis in India

Context:

Indian cities including Delhi and Mumbai are witnessing frequent urban flooding due to dysfunctional drainage systems, climate change, and rising concretisation, prompting renewed focus on urban flood management.

About Urban Drainage Crisis in India:

What it is?

- Urban drainage refers to the infrastructure and systems used to manage rainwater and prevent urban flooding. These systems are now failing across major Indian cities.

Recent Trends:

- As per MoHUA, over 70% of urban areas lack scientifically planned stormwater drains.
- Mumbai: Stormwater drains built in 1860s handle only 25 mm/hour rainfall and city now frequently experiences over 100 mm/hour.
- Has lost 80% of its natural water bodies in the past 40 years.
- Delhi: Drainage standards are based on 1976 norms, designed for 50 mm/day and May 2025 saw 185.9 mm rainfall in one day, 9x above normal.
- Bengaluru: Lacks a natural river system; outdated and narrow stormwater drains (SWDs) are easily overwhelmed.
- Over 65% of interlinked lakes encroached; Bellandur and Varthur lakes now surrounded by concrete.

Reasons Behind Drainage Failures:

1. Natural Causes:

- Intensifying Rainfall: Climate change has increased frequency and intensity of short-duration, high-volume rainstorms.
- E.g., IMD recorded 100mm+ rainfall in Delhi in less than an hour (2023).
- Low-lying Topography: Certain zones like Bengaluru and Mumbai are naturally prone to

2. Man-made Issues:

- Unplanned Urbanisation: Encroachment on floodplains and concretisation has reduced ground permeability.
- Poor Design Standards: Drainage designed for 1-in-2-year events is insufficient for today's storm intensities.
- Illegal Constructions: Unauthorized covers on drains make desilting and maintenance difficult.
- Infiltration of Sewage: Lack of separate sewerage and drainage lines in cities like Patna and Bhopal.

Government Initiatives to Tackle the Drainage Crisis

- Manual on Stormwater Drainage Systems (2019): Recommends higher return periods (1-in-5 or 1-in-10 years) for new infrastructure.
- AMRUT 2.0 Scheme: Mandates creation of integrated stormwater networks and harvesting around clean water bodies.
- Jal Shakti Abhiyan & Atal Bhujal Yojana: Promotes groundwater recharge via check dams, recharge pits in urban areas.
- Model Building Bye Laws (MBBL), 2016: Rainwater harvesting made compulsory for plots over 100 sq. m.
- Amrit Sarovar Mission: Rejuvenation of urban waterbodies to aid stormwater retention.
- GIS-Based Drainage Mapping: Cities like Delhi are adopting simulation models to redesign drainage based on land-use dynamics.

Way Forward

- Underground Storage: Build rainwater retention tanks under public spaces to reduce surface runoff.
- Enforce Building Codes: Ensure mandatory compliance with MBBL and zoning laws.
- Decentralised Solutions: Promote rooftop gardens, permeable pavements, and bioswales.
- Periodic Drain Maintenance: Timely desilting and cleaning of both visible and covered drains.
- Public Awareness: Launch city-level campaigns on waste disposal and water conservation.

Conclusion:

The drainage challenge in India is a complex outcome of outdated infrastructure, haphazard development, and climate extremes. While solutions exist, their success hinges on multi-level coordination, robust enforcement, and proactive urban planning. Transforming drainage from a reactive to a resilience-based approach is the need of the hour.

UMEED Portal

Context:

The Centre will launch the UMEED Portal on 6 June 2025 to digitize and streamline Waqf property registration in line with the Waqf (Amendment) Act, 2025.

About UMEED Portal:

What It Is?

- UMEED stands for Unified Waqf Management, Empowerment, Efficiency, and Development. It is a centralized digital platform for registering and regulating Waqf properties across India.
- Nodal Ministry: Ministry of Minority Affairs, in coordination with State Waqf Boards and judicial authorities.

Objectives of the Portal:

- Ensure transparent and time-bound registration of Waqf properties.
- Empower beneficiaries with digital access to rights, obligations, and legal safeguards.
- Resolve long-standing property disputes and enhance accountability.
- Facilitate policy-level insights through real-time data and geotagged mapping.

Key Features of UMEED Portal:

- Time-Bound Registration: All Waqf properties must be registered within 6 months of launch.
- Geotagging and Digitization: Properties must include precise measurements and geolocation data during registration.
- Dispute Resolution Trigger: Unregistered properties after deadline will be declared disputed and sent to Waqf Tribunal.
- User Support Services: Provides legal awareness tools and clarifies rights under amended law.
- Women-Centric Provision: Properties under women's names cannot be designated as Waqf, but women, children, and EWS will remain eligible beneficiaries.

About Waqf Properties:

What is Waqf?

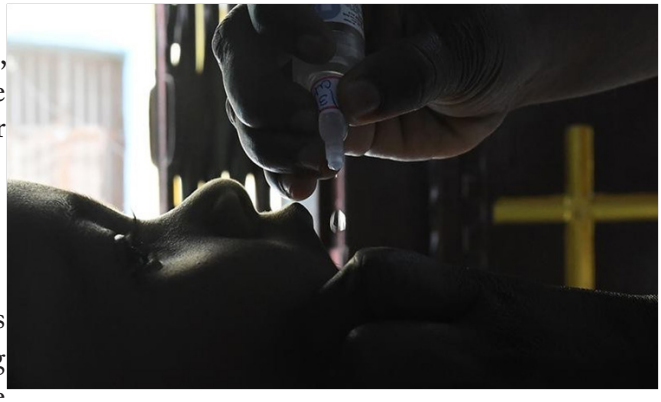
- Waqf is a permanent charitable endowment under Islamic law where property is donated for religious or public welfare use. It cannot be sold, inherited, or transferred.

Key Reforms in Waqf (Amendment) Act, 2025:

- Appeals Mechanism Introduced: Decisions of Waqf Tribunals are now appealable in High Courts within 90 days—ensuring judicial oversight.
- Mandatory Digital Registration: Introduced a strict 6-month deadline for all Waqf property registrations.
- Tribunal Empowerment: Unregistered properties post-deadline will be automatically flagged as disputed and adjudicated by Waqf Tribunals.
- Stronger Government Oversight: Enhanced monitoring by State Waqf Boards and increased regulation of trusteeship.

National Polio Surveillance Network (NPSN)

Context:



The Government of India, in coordination with WHO, plans to gradually phase out the National Polio Surveillance Network (NPSN) starting June 2025, reducing the number of centres from 280 to 140 by 2026–27.

About National Polio Surveillance Network (NPSN):

What is NPSN?

- The National Polio Surveillance Network is India's key disease surveillance mechanism for detecting and controlling polio and other vaccine-preventable diseases.

When was it established?

- Year: 1997
- Initiative: Originally called the National Polio Surveillance Project (NPSP)

Organizations Involved:

- World Health Organization (WHO)
- Ministry of Health and Family Welfare (MoHFW), Government of India

Objective:

- To support polio eradication by identifying and investigating cases of Acute Flaccid Paralysis (AFP).
- To monitor immunisation campaigns and ensure zero transmission of wild polio virus.

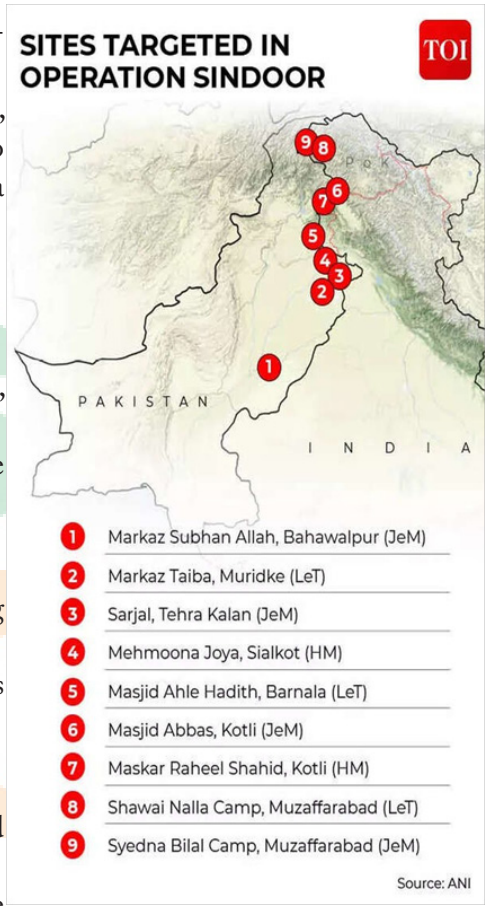
Key Functions:

- Disease Surveillance: Tracks AFP cases and conducts lab-confirmed verification.
- Vaccination Support: Assists in pulse polio campaigns and routine immunisation.
- Capacity Building: Trains state and district health officials on surveillance protocols.
- Integrated Health Role: Now supports measles-rubella elimination and control of other Vaccine-Preventable Diseases.
- Staff Deployment: Over 200 field units led by Surveillance Medical Officers (SMOs) spread across all states and union territories.
- This will eventually integrate with the Integrated Disease Surveillance Programme (IDSP).

1: Operation SINDOOR

Operation SINDOOR was launched by India in May 2025 as a direct response to the Pahalgam terror attack on April 22, 2025, where 26 Indian tourists were brutally killed, with the assailants reportedly segregating victims based on religion.

- The attack was claimed by The Resistance Front, a proxy of Lashkar-e-Taiba.
- In retaliation, India executed Operation SINDOOR — a swift, precise, and non-escalatory military campaign designed to dismantle cross-border terror infrastructure, without provoking a wider conventional war.



Key Achievements and Strategic Outcomes:

Neutralisation of Terror Infrastructure:

- Nine major terror camps of Lashkar-e-Taiba, Jaish-e-Mohammed, and Hizbul Mujahideen in Pakistan and PoJK were destroyed.
- Over 100 terrorists were neutralised, including high-profile operatives linked to the IC-814 hijack and Pulwama attacks.

Deep Cross-Border Precision Strikes:

- Strikes penetrated deep into Pakistani territory, including Bahawalpur and Punjab province, previously considered red zones.
- Signaled India's intent to strike beyond the LoC if terrorism is state-sponsored.

Technological Superiority Demonstrated:

- The Indian Air Force used Rafale jets, SCALP missiles, and HAMMER bombs with precision.
- Pakistan's air defences, including Chinese-origin systems, were bypassed or jammed, exposing vulnerabilities.

Air Defence Success and Indigenisation Push:

- India's Akashteer system played a key role in intercepting hostile drones and missiles.
- The operation highlighted the strength of indigenous defence capabilities with potential for exports.

Targeting Sponsors Alongside Terrorists:

- India deliberately eliminated support infrastructure and backers, breaking the long-standing distinction between terrorists and their enablers.

Limited Escalation, Maximum Precision:

- Civilian casualties and collateral damage were avoided, showcasing India's calibrated and ethical use of force.
- Avoided escalation into a wider war, maintaining regional stability.

Airstrikes on Military Installations:

- On May 9–10, India targeted 11 Pakistani military airbases, destroying nearly 20% of Pakistan's air assets, including strategic fighter jets at Bholari Air Base.

Tri-Service Coordination:

- The operation saw seamless coordination between the Army, Navy, and Air Force, reflecting enhanced joint operational readiness and synergy.

Strategic Messaging and Global Support:

- Operation SINDOOR sent a powerful diplomatic message: India will act decisively without seeking international approval.
- Gained unprecedented global support, with many nations endorsing India's right to self-defence.

Narrative Shift on Kashmir:

- India reframed the conflict as a counter-terrorism response, delinking it from the Kashmir political issue.
- Helped reshape international perception towards a security-driven understanding of the region.

Strategic Significance:

- Deterrence Reinforced: The operation demonstrated India's zero-tolerance policy toward cross-border terrorism, and its readiness to retaliate with force without fear of nuclear escalation.
- Escalation Management: India avoided civilian casualties and military assets, preserving regional stability while asserting its security interests.
- Technological Independence: The deployment of indigenously developed systems like Akash, IACCS, and domestically integrated ISR networks reflects India's growing self-reliance in defence.
- Integrated Warfare Capability: The operation showcased tri-service coordination, real-time intelligence sharing, and command integration, marking a shift towards network-centric warfare.
- Regional Security Messaging: Operation SINDOOR conveyed a strong warning to both state and nonstate actors that India will respond decisively to cross-border terror threats.
- Diplomatic Leverage: India's growing global stature allowed it to manage international reactions, shaping the narrative on its own terms.

Conclusion:

Operation SINDOOR was not merely a military strike — it was a comprehensive assertion of India's strategic autonomy, moral clarity, and operational capability. It represents a new doctrine in India's national security playbook, where state-sponsored terrorism is countered with calibrated force and diplomatic finesse. The operation will likely serve as a benchmark for future counter-terror policies and reinforce India's position as a responsible yet resolute regional power.

2: Synergy of India's Armed Forces

In response to the Pahalgam terror attack (April 22, 2025), which killed 26 civilians, India launched Operation SINDOOR on May 7, 2025. It marked a major tri-services military campaign aimed at dismantling terror infrastructure across the LoC and deep inside Pakistan.

Key Highlights:

- Tri-services Coordination: The Indian Army, Air Force, and Navy operated in full synergy, showcasing India's capability for multi-domain warfare.
- Intelligence-led Strategy: Multi-agency intel confirmed and enabled targeted strikes on nine terror camps, minimizing collateral damage.
- Air Operations: IAF executed precision strikes on key air bases (e.g., Nur Khan, Rahim Yar Khan), maintained airspace integrity through layered air defense using systems like Akash, Pechora, and OSAAK.
- Army's Role: Efficient in both defensive/offensive roles, the Army neutralized drone attacks with LLADs, MANPADS, and long-range SAMs.

- Navy's Presence: Asserted maritime superiority using a Carrier Battle Group; enforced a maritime nogo zone near Pakistan's Makran coast, preventing aerial incursions.
- BSF Action: Foiled infiltration at Samba sector, J&K, neutralizing terrorists and seizing weapons.

Technological Integration: Use of Integrated Command and Control Strategy (ICCS) and net-centric operations enabled real-time coordination and threat interception.

Major Government-Led Coordination Efforts among the Armed Forces

Chief of Defense Staff (CDS) & Department of Military Affairs (DMA): Created on 24 Dec 2019, the CDS is a 4-star General and principal military adviser to the defense minister.

Key Roles of the CDS:

- Leadership & Oversight: Heads the Army, Navy, Air Force, and Territorial Army; leads tri-service organisations including cyber and space commands.
- Jointness & Integration: Promotes jointness in procurement, training, staffing, and restructuring of commands; fosters integration for a unified and modern force.
- Strategic Planning & Advisory: Advises the Nuclear Command Authority; participates in defence planning; drives reforms to optimise resources and enhance combat efficiency.
- Acquisition & Resource Optimisation: Implements multi-year defence acquisition plans, aligns interService priorities, and reduces redundancy and waste.
- Integrated Theatre Commands (ITCs): ITCs and Integrated Battle Groups (IBGs) aim to unify tri-service capabilities by geography/function, enhance jointness, and separate operational from Raise-Train-Sustain (RTS) roles.
- Proposed commands include Land, Maritime, and Air Defense domains. CDS Gen Anil Chauhan emphasized jointness for multi-domain, data-centric warfare.

Inter-Services Organizations Act, 2023: Empowers commanders of tri-service formations to exercise disciplinary control across services, enabling unified command, faster decisions, joint culture, and legal backing for ITCs, while retaining individual service identity.

Joint Logistics Nodes (JLNs): Operational since 2021 at Mumbai, Guwahati, Port Blair. Provide integrated logistics (ammunition, rations, fuel, engineering, etc.), saving manpower, resources, and costs.

Joint Training, Seminars & Exercises:

- Tri-Services Future Warfare Course: Initiated by CDS for Majors to Major Generals; 1st held in Sept 2024, 2nd in Apr–May 2025, focused on modern tech-based warfare.
- DSTSC (10 June 2024, MILIT Pune): 166 officers (Army, Navy, IAF, Coast Guard, foreign nations); first triservice joint training.
- Parivartan Chintan (8 Apr 2024): Brainstorming for joint structures.
- Seminar (25 Feb 2025): On Air-Naval synergy in IOR by HQ Southern Air Command & CAPS.
- Exercise Prachanda Prahar (25–27 Mar 2025): Tri-service high-altitude operation in Arunachal.
- Exercise Desert Hunt (24–28 Feb 2025): Joint SF drill with Para SF, MARCOS, Garud at Jodhpur.

Technology & Network-Centric Warfare:

- Defense Communication Network (DCN): Secure, indigenous tri-service network supporting voice/ data/ video; a Make in India success.
- Integrated Air Command and Control System (IACCS): Enables real-time joint coordination; proved effective post-Operation SINDOOR.
- 'Year of Defense Reforms' – 2025: Declared by MoD to boost jointness, establish ITCs, improve inter-service cooperation, and enable multi-domain integrated operations.

3: Rural Prosperity Through Warehousing

Despite the rapid expansion of Kisan Credit Cards (KCCs) in India, the post-harvest credit segment remains severely underutilized.

- In FY 2023–24, India's total agricultural credit was approximately 25 lakh crore, of which short-term credit (mainly for crop cultivation) accounted for 14.8 lakh crore.
- However, post-harvest loans were just 0.35 lakh crore—a mere 1.4% of total agricultural credit. This low uptake is mainly due to:

- Banks' reluctance to finance against stored produce (pledged loans),
- Risk of misappropriation or fraud in unregulated warehouses,
- Lack of proper legal recourse and enforcement mechanisms.

Mismatch in Production and Storage

According to NABARD (2024), India's agricultural warehousing capacity is 239.70 MMT, while food grain production stood at 328.85 MMT, creating a gap of nearly 90 MMT.

- This mismatch limits farmers' ability to store produce and wait for better prices, forcing distress sales at harvest time.

Economic Benefits of Warehousing

Warehousing offers much more than just storage:

- Scientific storage prevents post-harvest losses from pests, moisture, and handling.
- Electronic Negotiable Warehouse Receipts (e-NWRs) issued by WDRA-registered warehouses can be traded or used to secure bank loans.
- Warehousing supports price realization. Agmarknet data shows that deferring sale of crops like paddy (basmati), turmeric, chilli, and jeera by even a few months after harvest leads to significantly better prices.
- A study by IIM Bangalore found that a 1% increase in warehouse capacity reduces price volatility by 2.0% for wheat and 2.7% for masur, thus stabilising farmer incomes.

Warehouses also help reduce price spread between wholesale and retail, benefitting both producers and consumers. Given that food and beverages constitute 54.18% of the Consumer Price Index (CPI) basket, stabilising food prices has a major impact on inflation control.

India's Agricultural and Rural Profile

- 68.85% of India's population lives in rural areas (Census 2011).
- 58.4% of the rural workforce is still engaged in agriculture.
- NITI Aayog projects that rural population will remain above 50% till 2045.
- India's foodgrain production target for 2025–26 is 354.64 MMT.

Final estimates for 2023–24 (Ministry of Agriculture):

- Foodgrains: 3322.98 LMT
- Oilseeds: 396.69 LMT
- Sugarcane: 4531.58 LMT
- Cotton: 325.22 lakh bales
- Jute & mesta: 96.92 lakh bales
- Despite this high productivity, marketing, storage, and price realisation remain weak links in the agri-value chain.

Key Challenges in Agricultural Warehousing

- Storage Shortage: A significant gap (~90 MMT) exists between agri-production and available warehousing capacity.
- Small Warehouse Sizes: Over 68% of India's 51,307 warehouses have capacities of less than 500 tonnes, making them unsuitable for professional management and scientific storage.
- Skewed Distribution: Most warehouses are concentrated in a few states. The Gangetic belt—a key production region—is underserved, affecting cereals, pulses, and oilseeds.
- Low Farmer Awareness: A MANAGE study revealed poor awareness among farmers regarding:

Post-harvest pricing trends

- Pledge financing
- e-NWR benefits
- Government schemes
- Regulatory Gaps: As per the Warehousing (Development and Regulation) Act, 2007, only warehouses issuing e-NWRs must register with WDRA. This allows others to remain unregulated, reducing fiduciary trust among farmers and banks.

- Banking Hesitation: Due to past experiences of fraud and poor recovery, many public sector banks are wary of financing warehouse-stored produce.

Government Initiatives to Bridge the Gap

- Agriculture Infrastructure Fund (AIF)
- Outlay: 1 lakh crore
- Purpose: Build post-harvest infrastructure including cold chains, silos, and warehouses
- Special focus on farm-gate infrastructure
- World's Largest Grain Storage Plan
- To be implemented via PACS (Primary Agricultural Credit Societies)
- Also backed by 1 lakh crore investment to build storage at the grassroots
- Credit Guarantee Scheme for e-NWR Pledge Finance (CGS-NPF)
- Outlay: 1000 crore
- Provides guarantee cover to banks lending against e-NWRs
- Focuses on small and marginal farmers, with higher coverage and lower fees
- Interest Subvention Scheme
- Offers 1.5% interest subvention on loans against e-NWRs for small/marginal farmers with KCCs
- Aims to reduce cost of borrowing

e-Kisan Upaj Nidhi Portal

- Digital platform for quick loan approvals
- Integrated with banks, credit bureaus, WDRA, and e-NAM
- Enables farmers to select banks of their choice and receive in-principle loan approval rapidly
- Infrastructure Development Programs
- Private Entrepreneurs Guarantee Scheme (PEG)
- Construction of Silos under PPP
- Warehousing Infrastructure Fund

Conclusion and Way Forward

- A robust, well-regulated warehousing ecosystem can transform India's agricultural economy. It can:
- Help farmers avoid distress sales
- Provide post-harvest liquidity
- Stabilise prices and reduce inflation
- Promote rural income growth and food security

Key priorities moving forward:

- Expand scientific and scalable storage infrastructure in surplus zones.
- Mandate WDRA registration for all warehouses to ensure uniform regulation.
- Increase awareness among farmers about warehousing benefits, price trends, and credit instruments.
- Encourage bank participation in post-harvest finance by enhancing risk mitigation frameworks.
- A multi-pronged policy approach can unlock the full potential of agri-warehousing and drive inclusive rural prosperity.

4: Safe Food for a Healthy India

Food safety is an essential aspect of public health, economic development, and national food security. In India, where agriculture employs nearly half the population and food consumption is a daily concern for 1.4 billion people, ensuring food safety from farm to fork is both a challenge and necessity.

The Scope and Importance of Food Safety

- Definition: Food safety involves handling, preparing, storing, and distributing food in ways that prevent contamination and foodborne illnesses.

Hazards addressed include:

- Biological: Bacteria (e.g., E. coli, Salmonella), viruses (e.g., Hepatitis A), fungi (e.g., aflatoxins), parasites
- Chemical: Pesticide residues, heavy metals (e.g., lead, arsenic), additives, toxins from poor storage.

- Physical: Glass, plastic, or metal fragments during processing.

Why it matters:

- According to WHO, unsafe food causes 600 million illnesses and 4.2 lakh deaths globally each year.
- In India, foodborne diseases like diarrhoea, cholera, and pesticide poisoning are rampant, especially affecting children.

Food safety impacts:

- Public health
- Farmer livelihoods
- Trade competitiveness
- Consumer trust
- Environmental sustainability

Key Challenges in India's Food Safety Ecosystem

A. Excessive Pesticide Use

- India ranks 4th globally in pesticide consumption.
- Pesticide residues above permissible limits are commonly found in fruits, vegetables, and grains.
- Banned pesticides like monocrotophos are still used in some regions.

Consequences:

- Long-term health effects including cancer and neurological disorders.
- Soil and water contamination.
- Export rejections due to residue levels exceeding Codex/European Union norms.

Solution: Promote Integrated Pest Management (IPM), organic farming, stricter regulation enforcement, and farmer training.

B. Post-Harvest Handling and Infrastructure Deficit

- India loses nearly 30% of food produce annually due to poor storage and transport.
- Grains stored in open areas often develop aflatoxins, a carcinogenic fungus.
- Lack of cold chains, hygienic processing, and scientific storage affect food quality and safety
- Small and marginal farmers lack access to post-harvest technologies.

Solution: Invest in:

- Modern warehouses and cold chains (e.g., under Agriculture Infrastructure Fund).
- Training for farmers on safe storage and handling.
- Digitisation and traceability tools (e.g., blockchain).

C. Widespread Food Adulteration

- According to FSSAI (2018), 68% of milk samples in India were found adulterated.

Common adulterants include:

- Urea, starch, and detergents in milk.
- Metanil yellow in turmeric.
- Argemone oil in mustard oil.
- Artificial colours and low-quality oils in spices and sweets.
- Such adulteration can cause organ damage, cancer, and food poisoning.

Solution:

- Strengthen food testing laboratories (especially at the district level).
- Enforce stricter penalties under FSS Act, 2006.
- Promote citizen reporting, use of QR codes and mobile-based testing tools.

D. Weak Implementation of Food Safety Laws

- The Food Safety and Standards Act (FSSA), 2006, is poorly implemented in rural and informal markets.

- FSSAI lacks manpower and infrastructure to monitor millions of food vendors, especially in Tier-II and Tier-III cities.

Solution:

- Decentralise food safety enforcement through panchayats and municipal bodies.
- Increase recruitment and training of food safety officers.
- Ensure registration/licensing of all food business operators (FBOs).

E. Lack of Awareness and Hygiene Practices:

- Many small farmers and street food vendors are unaware of hygiene protocols, such as washing produce, sanitising tools, or wearing gloves.
- Street food is often prepared in unsanitary conditions, increasing disease transmission risks.
- Consumers are also not educated enough to distinguish safe from unsafe food.

Solution:

- Launch mass awareness campaigns like Eat Right India.
- Introduce food safety curriculum in schools and agricultural training institutes.
- Encourage self-regulation models, hygiene ratings, and consumer feedback systems.

Economic and Global Trade Impacts

- Food safety is critical for India's agro-export potential.
- High-value exports like spices, seafood, and basmati rice face frequent rejections due to contamination.
- These result in billions in losses and damage India's global brand reputation.
- Safe food opens up access to premium international markets, helping farmers earn better prices and incomes.

Government Interventions

FSSAI Initiatives:

- Eat Right India campaign
- Safe and Nutritious Food (SNF) awareness drives
- Clean Street Food Hubs

Policy Reforms:

- Strengthening Food Recall Mechanisms
- Launch of Food Safety Compliance System (FoSCoS) portal
- Schemes Promoting Safety & Hygiene:
- PM Formalisation of Micro Food Processing Enterprises (PM-FME)
- Agri-Infra Fund for better storage
- Kisan Rail and Kisan Udan to speed up farm-to-market access

Key Challenges in Ensuring Food Safety

- Fragmented Supply Chains: India's agricultural supply chain involves multiple intermediaries, leading to higher risks of contamination and lack of traceability. Traditional mandis are poorly equipped to track the origin of spoilage or adulteration.
- Economic Constraints of Farmers: Small and marginal farmers often lack access to safe storage, quality inputs, and affordable technologies. Financial constraints and dependence on middlemen hinder adoption of food safety measures.
- Infrastructure Gaps: India has fewer than 200 accredited food testing labs against a requirement of over 500. Less than 10% of perishable goods have access to cold storage, resulting in high post-harvest losses and food contamination.
- Adulteration and Pesticide Residues: Rampant use of chemical pesticides and banned substances like monocrotophos has led to harmful residues in produce. Food adulteration—especially in milk, oils, and spices—poses a major public health threat.
- Export Rejections: Indian agro-exports, particularly basmati rice and spices, often face rejections in global markets due to pesticide residues, causing estimated losses of $15–20 billion annually.

Way Forward

- Farmer Education and Good Agricultural Practices (GAP): Training programs through Krishi Vigyan Kendras (KVKs) and NGOs can promote safe pesticide use, hygienic harvesting, and awareness on residue limits.
- Promotion of Organic and Natural Farming: Expanding schemes like Paramparagat Krishi Vikas Yojana (PKVY) and Bhartiya Prakritik Krishi Padhati (BPKP), along with subsidies for organic inputs and certification, can encourage a shift to sustainable agriculture.
- Strengthening Infrastructure: Investments are needed in cold chain logistics, food testing laboratories, and modernised storage and processing facilities. Upgrading APMCs with integrated food safety checks is also vital.
- Technology for Transparency: Use of blockchain for farm-to-fork traceability and AI-based advisory tools can reduce risks and improve decision-making at the farm level.
- Policy Reform and Regulatory Enforcement: Expanding FSSAI's outreach in rural areas, imposing strict penalties for violations, and conducting regular inspections can ensure compliance with food safety standards.
- Consumer Awareness: Campaigns like 'Eat Right India' must be scaled up, along with mandatory food safety labelling, to promote informed consumer choices and create demand for safer food.

Conclusion:

Food safety is integral to India's sustainable development goals. A comprehensive strategy involving policy reform, technological innovation, farmer empowerment, and consumer participation is essential to build a resilient and trustworthy food system. By ensuring safety from farm to fork, India can protect public health, enhance farmer incomes, and strengthen its position in global agricultural trade—paving the way for a healthier, more prosperous future.

5: Opportunities and Challenges in India's Food Export Sector

India's food export sector plays a crucial role in its foreign exchange earnings and rural development. As one of the world's largest producers of agricultural products, India holds untapped potential in expanding its global market share.

- While recent trends point to increasing exports of processed foods and diversification into high-value products, multiple structural and policy-related challenges continue to constrain the full realization of this sector's potential.

Significance of the Food Export Sector

Agriculture is the primary source of livelihood for a significant proportion of India's population. India is among the top producers of rice, wheat, pulses, fruits, vegetables, and dairy. Food exports contribute in several key areas:

- Foreign Exchange Earnings: Major source of export revenue, reducing the trade deficit.
- Employment Generation: Especially in rural areas, through agriculture, food processing, and allied sectors.
- Rural Development: Enhanced income, infrastructure development, and access to education and health services.
- Poverty Alleviation: Direct impact on farmer incomes and local economies.

Despite these advantages, India's share in global agricultural exports remains modest at around 2.4%, indicating a vast untapped potential.

Current Export Scenario and Decline

India was aiming for $60 billion in agri-exports by 2022 under the Agriculture Export Policy (AEP) 2018, but actual exports in 2023-24 stood at $48.8 billion, down from $53.2 billion in the previous fiscal year.

- This 8% decline underscores the need for strategic policy realignment and infrastructural improvement.

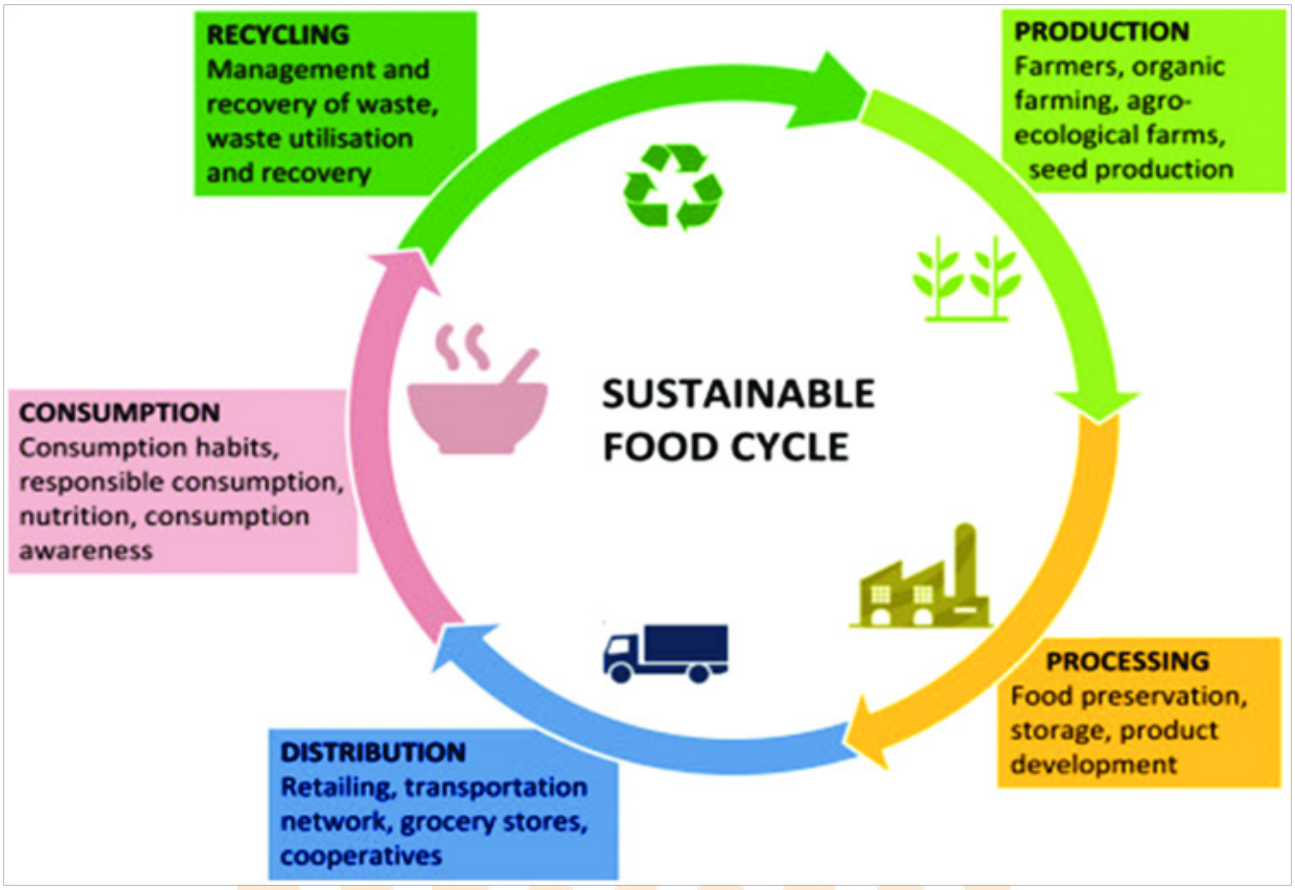
Government Initiatives and Institutional Framework

Several key policy and institutional frameworks support food exports:

- Agriculture Export Policy (AEP) 2018: Aims to diversify the export basket, promote high-value and organic produce, and integrate Indian farmers into global value chains.
- APEDA: Facilitates agricultural exports with quality certifications, infrastructure support, and market intelligence.

- Financial Assistance Scheme (FAS) and Trade Infrastructure for Export Scheme (TIES): Promote investment in export-related infrastructure and market development.
- Market Access Initiative (MAI): Supports exporters in discovering and penetrating new markets.

Key Challenges Hindering Growth



India's agricultural export sector faces multiple challenges:

- Export Uncertainty: Frequent bans (e.g., on rice, sugar) create global unreliability.
- Concentration on Few Commodities: Overdependence on rice and sugar makes exports vulnerable to price and demand shocks.
- Infrastructure Deficit: Lack of cold chains, storage, and transport reduces efficiency.
- Quality Standards: Many exports fail to meet international hygiene and phytosanitary norms.
- Global Competition: Nations like Vietnam (rice), Brazil (sugar), and Thailand (processed foods) offer stiff competition.

Opportunities and Strategic Directions

Despite these hurdles, India's food export potential remains robust:

- Diversification: Emphasis on high-value products like spices, ready-to-eat meals, millets, organic produce, and fruit concentrates.
- Sustainability: Pulses and oilseeds, which require less water, align with global eco-trends.
- New Markets: Rising demand in Middle East, Africa, East Asia, and EU for Indian staples and specialty products.

Technological Integration:

- Blockchain for traceability and compliance
- Precision Farming to enhance productivity
- Digital platforms to streamline logistics and document management
- Brand Building: Positioning Indian products like Basmati rice, spices, and organic items as premium global brands.

Advantages of Processed Food Exports

Processed food exports offer significant economic and logistical benefits:

- Longer Shelf Life: Reduces post-harvest loss and increases export feasibility.
- Value Addition: Enhances profitability and marketability.
- Branding and Market Expansion: Allows product customization for different regions and culinary preferences.
- MSME Participation: Boosts employment and rural entrepreneurship.

In 2023–24, processed food exports reached USD 7.7 billion, with strong growth in categories like mango pulp, cereal preparations, and processed vegetables.

The Circular Economy: A Sustainable Approach to Food Exports

India must align its food processing and export sectors with Circular Economy (CE) principles to ensure longterm sustainability and global competitiveness. CE practices can:

- Reduce Wastage: Through sustainable farming and improved logistics.
- Utilise By-products: Creating new revenue streams from agricultural residue.
- Enhance Packaging: Use biodegradable and eco-friendly materials.
- Optimize Supply Chains: Reduce energy use and enhance transport efficiency.
- Meet Global Norms: Tapping into markets with strict environmental regulations.

Government support through incentives, capacity building, and regulatory frameworks will be essential for CE integration.

Way Forward and Conclusion

India's food export sector, if nurtured through strategic reforms, infrastructure development, and sustainability practices, can emerge as a global leader. The government must focus on:

- Stable Export Policies
- Investment in R&D and Infrastructure
- Skill and Quality Development
- Encouragement for Food Processing and Innovation

Incorporating Circular Economy principles will not only make Indian products more sustainable but also more attractive to environmentally conscious global consumers. With the right interventions, India's food export can contribute significantly to inclusive economic growth, rural development, and global food security.

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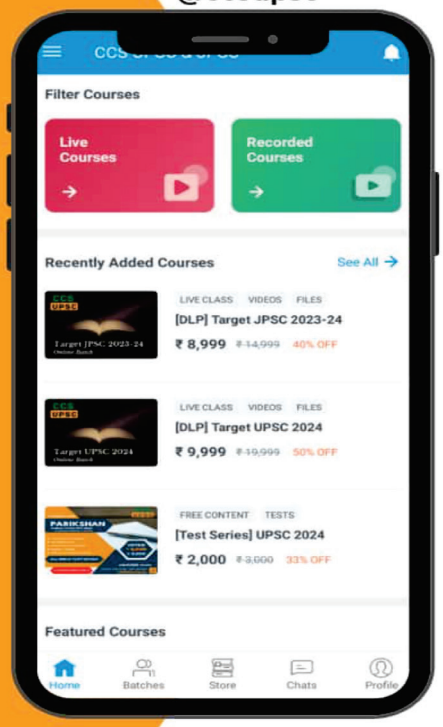

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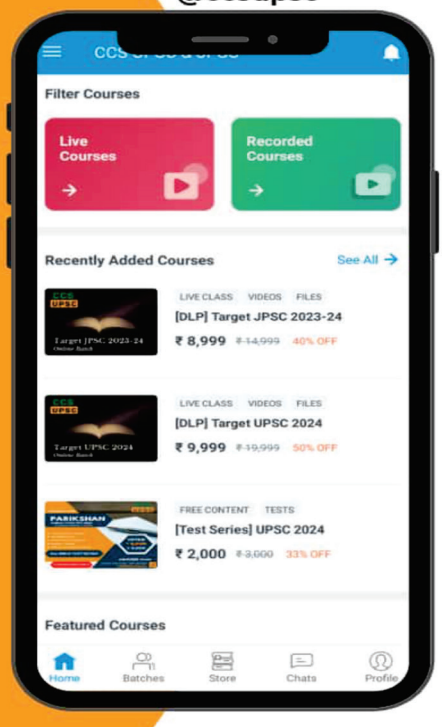

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