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INSIDE

GENERAL STUDIES – 1

Topics: Women and women related issues.

MATERNITY REINTEGRATION IN INDIA

Context:

A recent article highlights that maternity reintegration—not just maternity leave—is the real test of inclusion in Indian workplaces.

About Maternity Reintegration in India:

What it is?

- Reintegration refers to the seamless transition of women employees from maternity leave back into the workforce.
- It goes beyond statutory leave and covers policy support, workplace culture, and long-term career progression.

Pressures faced by new mothers:

1. **Family expectations:** Caregiving is still seen as a woman's primary duty, reinforcing gender stereotypes.

   Eg: Studies show Indian women spend ~7 hours/day on unpaid care work compared to men's ~2.5 hours (NSSO 2019).
2. **Societal norms:** Mothers face guilt if they don't conform to the "always available caregiver" stereotype.

   Eg: Cultural perception that "a good mother sacrifices career" persists across regions.
3. **Inner struggles:** Fatigue, self-doubt, and emotional turmoil make balancing work and home tougher.

   Eg: Reports of post-maternity imposter syndrome rising in corporate surveys.
4. **Organisational systems:** Inflexible roles, lack of childcare, and managerial apathy often push women out.

   Eg: Deloitte (2022) found attrition highest among women returning post-maternity in Indian corporates.

Ripple Effects of Dropouts:

On organisations:

1. **Talent attrition:** Women who leave post-maternity take away years of institutional knowledge and expertise.

   Eg: Deloitte (2022) found mid-level attrition costs firms 150–200% of the employee's annual salary.
2. **Pipeline disruption:** The leadership funnel weakens when skilled women exit before reaching senior roles.

   Eg: Marching Sheep Inclusion Index (2025) – 63% of listed firms in India have no women in Key Managerial Positions.
3. **Cultural setback**: A pattern of female exits creates a perception of workplaces being unsupportive, lowering morale and diversity goals.

   Eg: NASSCOM (2023) survey highlighted inclusivity as a key retention driver in tech firms.

On economy:

1. **Low participation rate:** India's female labour force participation is just ~37% (PLFS 2024), among the lowest in G20 economies.

   Eg: Much below Bangladesh (~41%) and China (~61%).
2. **GDP loss:** McKinsey Global Institute estimates equal participation could boost India's GDP by 27% (~$770 billion).

   Eg: Japan's "womenomics" policy linked higher GDP growth with women's participation.
3. **Reduced innovation**: Exits from R&D, STEM, and corporate roles reduce diversity of thought, limiting economic dynamism.

   Eg: World Bank (2022) – firms with gender diversity in management show 20% higher innovation revenues.

On society:

1. **Reinforcing stereotypes**: Every dropout validates the bias that women cannot balance careers and family.

   Eg: Pew Research (2021) – 70% Indians believe men are "better suited" for paid work.
2. **Gender parity delays:** Early exits reduce women's representation in decision-making, slowing progress on SDG-5 (Gender Equality).

   Eg: India ranks 127/146 in Global Gender Gap Index 2024.
3. **Role model deficit:** Fewer senior women in visible positions weakens aspirational pathways for younger women.

   Eg: Only 18% of directors in NIFTY-500 companies are women (SEBI 2023).

Way forward:

1. **Policy alignment**: Expand **Maternity Benefit Act, 1961** provisions to include reintegration norms.
2. **Institutional support:** Encourage **mandatory workplace crèches**, subsidised childcare, and paternity leave for shared responsibility.
3. **Awareness campaigns:** Normalise work–motherhood balance through **CSR-led initiatives** and **public discourse**.
4. **Data-driven monitoring:** Mandate reporting on gender balance at Key Managerial Positions (KMPs).
5. **Global best practices:** Adopt models like **"returnships"** in the UK and US for structured re-entry.

Conclusion:

Reintegration is not charity but a **strategic investment in human capital**. For India, where women's labour participation is among the lowest globally, retaining skilled mothers in the workforce is vital for economic growth, gender parity, and social progress. A truly inclusive organisation is one where maternity is not seen as an exit point but as a natural phase in a thriving career journey.

THE DOMESTIC SPHERE IN INDIA

Context:

Recent debates around gender roles, dowry deaths, domestic violence, and the undervaluation of women's unpaid work have reignited questions about the domestic sphere in India.

About The Domestic Sphere in India:

Current Realities

1. **Violence and Inequality:**
   - NFHS-5 shows 30% of women face intimate partner violence, but only 14% lodge complaints.
   - ~7,000 dowry deaths annually (2017–22) reflect persistence of structural violence.
2. **Time Use Survey (2024) Findings**:
   - 93% of women spend ~7 hours/day on unpaid domestic services; 41% spend ~2.5 hours on caregiving.
   - Men average only 26 minutes in domestic work and ~16 minutes in caregiving.
3. **Invisible Contribution**:
   - SBI (2023) estimated unpaid domestic work by women equals **7% of India's GDP (~₹22.5 lakh crore)** if monetised.
   - Women workers in Anganwadi, mid-day meals, and ASHA services remain labelled as "volunteers" without formal recognition.

Ethical and Constitutional Dimensions:

- **Violation of Equality** – Contradicts Article 14 (Equality before Law) and Article 15 (prohibition of discrimination).
- **Denial of Dignity** – Domestic violence, marital rape debates, and undervaluation of work undermine Article 21 (Right to Life with Dignity).
- **Conflict with Directive Principles** – Article 39(d) (equal pay for equal work) and Article 42 (just and humane conditions of work) remain largely aspirational.
- **ARC's Warning** – The 2nd ARC in *Ethics in Governance* cautioned that **deep-rooted patriarchy in social institutions is the greatest barrier to probity and justice.**

Socio-Economic Significance of the Domestic Sphere:

- **Economic Subsidy**: Women's unpaid labour keeps subsistence wages low, indirectly subsidising capital and the economy.
- **Intergenerational Impact**: Care work sustains social reproduction of labour, influencing child development, education, and health outcomes.
- **Social Cohesion**: Violence and inequality at home ripple outward, eroding trust, productivity, and democratic participation.

Challenges:

- **Patriarchal Norms** – Societal glorification of women's sacrifices and "adjustment" in marriage.
- **Policy Blindness** – Resistance to criminalising marital rape; dilution of domestic violence protections.
- **Economic Undervaluation** – Informalisation of care workers and absence of wages for unpaid domestic work.
- **Gendered Labour Divide** – Disproportionate burden of household work on women across class and caste lines.
- **Institutional Silence** – Lack of strong political discourse or systemic redressal for domestic violence and exploitation.

Way Forward:

- **Legal & Institutional Reforms**:
  - Recognise and criminalise marital rape; strengthen Domestic Violence Act implementation.
  - Ensure fixed wages, benefits, and formal recognition for Anganwadi, ASHA, and mid-

day meal workers.

- **Economic Recognition**:
  - Explore mechanisms to account for unpaid work in national accounts.
  - Introduce social security and pension schemes for caregivers.
- **Cultural Shifts**:
  - Campaigns to promote shared domestic responsibilities between genders.
  - Encourage inclusion of gender sensitivity and equality in school curricula.
- **Policy Interventions**:
  - Universal childcare and elderly care facilities.
  - Expansion of maternity and paternity benefits to redistribute care burdens.
- **Data & Monitoring**:
  - Regular Time Use Surveys to guide gender-responsive policymaking.

Conclusion:

The domestic sphere is not a "private matter" but a **public issue with economic, social, and ethical consequences.** Recognising and reforming it is central to India's vision of justice, equality, and sustainable development. Only when women's invisible labour is valued, their dignity protected, and responsibilities shared can India truly become a **"nari-shakti-led" democracy, rooted in constitutional morality and** social justice.

Topics: Population and associated issues, poverty and developmental issues.

AGEING AND HEALTH BURDEN IN INDIA

Context:

The India Ageing Report 2023 highlights the mounting challenges of healthcare costs for senior citizens in India, especially amidst rising comorbidities, low insurance coverage, and inadequate financial preparedness.

About Ageing and Health Burden in India:

Background:

- India's elderly population (60+) stood at ~149 million in 2022; projected to reach **347 million (20.8%) by 2050**.
- Elderly face a "double burden":
  - **Health** – multiple comorbidities such as diabetes, hypertension, heart disease, arthritis, stroke.
  - **Finance** – reduced income, high dependency, poor social security.
- Out-of-pocket expenditure (OOPE) remains high (~48% of total health spending, National Health Accounts 2021-22), causing distress financing and debt.

Major Health Concerns of the Elderly:

- **Out-Patient Care:** Elderly frequently seek treatment for chronic pain, fever, hypertension, diabetes, and breathing/heart issues, reflecting the burden of non-communicable diseases.
- **In-Patient Care:** Hospitalisation is commonly required for heart disease, stroke, diabetic complications, infections, and surgeries, increasing financial and physical stress.
- **Recovery Issues:** Longer hospital stays, repeated infections, ICU needs, and poor drug compliance due to costs make recovery slower and more difficult.

Insurance Coverage: Present Status and Gaps

- **Schemes Available:** Central (PM-JAY) and state schemes like CMCHIS, along with CGHS, ESIC, and private health insurance, provide varying levels of coverage.
- **Coverage Remains Low:** Only 20% of elderly are insured, with higher coverage among men and urban residents compared to women and rural populations.
- **Barriers:** Low awareness (52.9%), high premiums, and complex enrolment processes restrict access to health insurance.
- **Exclusions:** Key services like palliative care, physiotherapy, rehabilitation, and home oxygen support are not covered, forcing out-of-pocket spending.

Cost of Healthcare: Why It Rises with Age?

- **Chronic NCDs:** Lifelong conditions like diabetes and hypertension require constant medication and monitoring, raising cumulative expenses.
- **ICU/Critical Care:** Comorbidities in elderly patients often demand high-cost ICU admissions and ventilatory support.
- **Private Insurance Premiums:** Premiums rise steeply with age, while reimbursements are often partial (about 75%), leaving large gaps.
- **Post-Treatment Costs:** Rehabilitation, physiotherapy,

and home-based care after discharge are typically uncovered and expensive.

- **End-of-Life Care:** No structured policy for palliative or terminal care leaves families bearing heavy financial burdens.

Initiatives Taken:

- **PM-JAY Expansion (2024):** Provides universal health coverage for all citizens above 70, regardless of income.
- **State Schemes Integration:** States like Tamil Nadu integrate local schemes (CMCHIS) with PM-JAY to widen access.
- **NPHCE:** Establishes geriatric clinics and regional centres for elderly-specific care across the country.
- **Health Insurance Reforms:** Simplification of enrolment and broader coverage aims to boost participation among elderly.
- **Public Hospital Strengthening:** States such as Kerala and Tamil Nadu have improved public geriatric healthcare infrastructure.

Challenges:

- **High OOPE:** Nearly half of healthcare costs are out-of-pocket, devastating for elderly with limited or no income.
- **Rural-Urban Divide:** Urban elderly access private hospitals and insurance, while rural elderly largely depend on household savings.
- **Insurance Gaps:** High premiums, exclusions, and low awareness make insurance inaccessible for most senior citizens.
- **Workforce Shortage:** India has only ~6,000 trained geriatricians, insufficient for its rapidly ageing population.
- **Palliative & Preventive Neglect:** Preventive measures like vaccination and palliative care remain underfunded and poorly integrated.
- **Gender Inequality:** Elderly women are less likely to have insurance or financial support, heightening their vulnerability.

Way Forward:

- **Financial Protection:**
  - Expand **Ayushman Bharat** to include **palliative, rehabilitative, and home-based care**.
  - Regulate private insurers to cap premiums for elderly.
  - Incentivise middle-age savings for healthcare (tax-deductions, health bonds).
- **Accessibility:**
  - Strengthen **public hospitals** for geriatric care (model of TN & Kerala).
  - Rural outreach through **Health & Wellness Centres** under Ayushman Bharat.
- **Preventive Health:**
  - National vaccination policy for elderly (influenza, pneumonia, shingles).
  - Early screening for diabetes, hypertension, cancers at PHCs.
- **Awareness & Literacy:**
  - Nationwide awareness campaigns on health insurance.
  - Simplified enrolment procedures, mobile units for rural elderly.
- **Human Resources:**
  - Establish geriatric departments in medical colleges.
  - Train ASHA workers and primary health staff in geriatric care.

Conclusion:

India is becoming an ageing society, making elderly healthcare vital for inclusive growth. The India Ageing Report 2023 urges urgent reforms in affordability, accessibility, and insurance. True to Dr. Ambedkar's vision of equality, today's challenge is dignity in ageing—ensuring the elderly live with health, security, and respect, free from debt or neglect.

Topics: Urbanization, their problems and their remedies.

LONELINESS & INDIA'S WORKING YOUNG

Context:

A recent column highlighted loneliness as the biggest "corporate disease" among India's working young (25–35 years), revealing how urban migration and work–party culture are eroding genuine relationships.

About Loneliness & India's Working Young:

What it is?

- A condition of **social isolation and emotional detachment**, despite being surrounded by people in workplaces and cities.
- Increasingly prevalent in **new-age urban centres** like Bengaluru, Gurugram, Pune, Hyderabad, Chennai.

Data & Stats:

- Survey of 14 firms: **56%** openly admit loneliness, **23%** feel it but deny, **21%** claim not lonely.
- Gender divide: **64% women** vs **36% men** acknowledge loneliness.
- Dating app use: **19% men** vs **4% women**.
- More acute among migrants in the 25–35 age group.

Causes of Loneliness:

- **Urban Migration & Dislocation** – uprooting from hometowns, culture, family, food, and familiar social ties.
- **Work-Sleep-Party Routine** – long hours, recovery weekends, and nightlife leave little scope for deep relationships.
- **Erosion of Traditional Bonds** – weakening of kinship, neighbourhood ties, and local community support in big cities.
- **Technology & Virtual Substitutes** – dating apps, speed-dating, and social mixers replace organic friendships.
- **Individualism & Aspirations** – prioritisation of career, income, and self-image over sustained relationships.

Effects of Loneliness Among India's Working Young:

- **Mental Health Strain**
  - Loneliness leads to anxiety, depression, and emotional emptiness.
  - The absence of close bonds aggravates stress and weakens resilience to workplace pressure.
- **Weakening of Social Capital**
  - Disconnected individuals withdraw from neighbourhood and community life.
  - Trust, cooperation, and solidarity—key ingredients of social capital—diminish in urban spaces.
- **Delay in Family Formation**
  - Many postpone marriage and parenthood due to lack of meaningful relationships.
  - This disrupts demographic balance and alters traditional kinship patterns.
- **Cultural Shifts in Relationships**
  - With self-made bonds weakening, arranged marriages are resurfacing as a stabilising option.
  - Parents and kinship networks step in where individual choice struggles to secure permanence.
- **Workplace Productivity Loss**
  - Lonely employees are prone to burnout, absenteeism, and high attrition.
  - Lack of camaraderie reduces collaboration, creativity, and overall organisational efficiency.

Way Ahead:

- **Sociological Interventions** – revive community networks, promote neighbourhood associations and urban collectives.
- **Workplace Reforms** – HR policies encouraging social bonding, mental health programmes, and work–life balance.
- **Digital Moderation** – regulate overdependence on dating apps; promote meaningful platforms for connections.
- **Cultural Anchoring** – festivals, shared rituals, and ethnic associations to preserve collective identity.
- **Policy Support** – urban planning with recreational spaces, youth clubs, and support systems for migrants.

Conclusion:

Loneliness among India's working young is not just an individual problem but a sociological concern linked to rapid urbanisation, migration, and modern work culture. Addressing it requires strengthening community bonds, recalibrating workplace structures, and balancing individualism with social solidarity. A society that nurtures relationships alongside growth can ensure holistic well-being of its young citizens.

BUILDING CLIMATE-RESILIENT CITIES IN INDIA

Context:

India's cities, projected to house nearly a billion people by 2070, face rising risks from flooding, heat waves, cyclones, and earthquakes, prompting urgent calls for climate-resilient urban planning.

About Building Climate-Resilient Cities in India:

Current Status of Urban Cities & Climate Vulnerabilities:

- **Flooding:** Unchecked urbanisation and poor drainage make two-thirds of residents vulnerable; economic damages may cross $30B by 2070.

- **Extreme Heat:** Concrete-heavy cities trap heat, making them 3–5°C hotter, increasing deaths, health risks, and productivity losses.
- **Transport:** A quarter of roads are flood-prone, where even partial submergence can paralyse half the transport system in major cities.
- **Housing:** More than half of future housing stock is yet to be built; poor design choices risk locking in vulnerabilities for decades.
- **Municipal Services:** Weak waste, drainage, and energy systems aggravate pollution and climate shocks, undermining resilience.

Need for Climate-Resilient Cities:

- **Safeguard Lives:** Rising disasters like floods and heatwaves threaten millions; resilience reduces mortality and displacement.
- **Protect Economy:** Cities generate 70%+ of jobs and GDP; climate-safe infrastructure ensures continuity of growth.
- **Promote Inclusion:** Climate-resilient design protects the urban poor who suffer most during disasters.
- **Reduce Losses:** Investing in resilience lowers long-term costs and makes cities more attractive for global capital.

Challenges Associated:

- **Weak ULBs:** Local bodies lack staff, funds, and expertise to integrate climate resilience into planning.
- **Fragmented Governance:** Overlapping responsibilities between state, city, and parastatal agencies delay action.
- **Financial Constraints:** Limited municipal revenue and slow access to international climate finance stall projects.
- **Poor Planning:** Encroachment on wetlands and floodplains amplifies flood risks and weakens ecosystems.
- **Inequality:** Slum dwellers and migrants live in hazard-prone zones with minimal protection or relief access.

Initiatives Taken in India:

- **NAPCC & SAPCCs**: Provide national and state-level frameworks to mainstream climate adaptation.
- **Sustainable Habitat Mission**: Targets greener buildings, efficient transport, and resilient waste systems.
- **Smart Cities Mission & AMRUT**: Embed resilience in core urban infrastructure projects.
- **Heat Action Plans**: Ahmedabad pioneered early warning, cooling centres, and public awareness, now scaled to other states.
- **PMAY-Urban**: Potential to integrate climate-smart housing for millions under Housing for All.

Strategies for Climate-Resilient Cities:

- **Urban Planning**: Adopt compact designs, restrict construction in high-risk areas, and enforce disaster-resistant building codes.
- **Flood Management**: Develop modern drainage, restore wetlands, and deploy predictive flood warning systems.
- **Heat Resilience**: Expand tree canopies, cool roofs, and shaded corridors while adjusting outdoor labour hours.
- **Transport**: Build elevated and redundant road/ metro systems that remain functional during floods.
- **Municipal Services**: Upgrade waste, water, and sanitation networks with climate-proof and circular economy principles.
- **Finance & Partnerships**: Mobilise funds via PPPs, green bonds, and climate funds, alongside citizen participation.
- **Capacity Building**: Train ULB staff, use GIS/AI risk mapping, and enhance institutional resilience at local levels.

Conclusion:

India's urban future depends on how well cities adapt to climate uncertainties. Climate-resilient planning is not just about disaster management but about ensuring sustainable economic growth, social equity, and ecological balance. The window for action is narrow — the time to build resilience is now.

GENERAL STUDIES – 2

Topics: Indian Constitution- historical underpinnings, evolution, features, amendments, significant provisions and basic structure; Comparison of the Indian constitutional scheme with that of other countries.

PERSONALITY RIGHTS IN INDIA

Context:

The Delhi High Court protected the personality rights of Aishwarya Rai Bachchan and Abhishek Bachchan against AI-generated misuse of their images and voices.

About Personality Rights in India:

What are Personality Rights?

- **Definition**: Legal rights safeguarding a person's name, image, likeness, signature, and voice from **unauthorised commercial exploitation**.
- **Constitutional Basis**: Rooted in **Article 21 (Right to Privacy & Dignity)**.
- **Statutory Anchors**:
  - **Copyright Act, 1957:** Performers' rights under **Sections 38A & 38B**.
  - **Trade Marks Act, 1999:** Celebrities can trademark names, catchphrases, signatures.
  - **Common Law Tort of Passing Off:** Protects against false endorsements or misuse of goodwill (Sec. 27).

Judicial Evolution of Personality Rights:

- **R. Rajagopal v. State of Tamil Nadu (1994)** – SC upheld privacy as part of Article 21; recognised control over identity use.
- **Rajinikanth case (Madras HC, 2015)** – Unauthorised film use of name/image restrained even without proof of deception.
- **Anil Kapoor v. Various Entities (Delhi HC, 2023)** – Protected voice, catchphrases, and persona; clarified free speech exception for satire & parody.
- **Jackie Shroff case (Delhi HC, 2024)** – Prohibited misuse on e-commerce & AI chatbots; stressed on brand equity dilution.
- **Arijit Singh v. Codible Ventures (Bombay HC, 2024)** – Voice cloning using AI ruled violation; highlighted generative AI risks.

Personality Rights vs Free Speech:

- **Article 19(1)(a)** guarantees free speech, but subject to **reasonable restrictions (Art. 19(2))**.
- Courts balance **dignity of individuals** with **public interest in creativity**.
- **Permissible Uses**: Lampoon, satire, parody, news reporting, art, scholarship.
- **Prohibited Uses:** Commercial exploitation, false endorsement, degrading deepfakes.
- **DM Entertainment v. Baby Gift House (2010)** cautioned against over-expansion that may stifle free speech.

Challenges in the Digital Era:

- **AI & Deepfakes**: Voice cloning, synthetic videos, and impersonation threaten privacy and dignity.
- **Rapid Proliferation:** Content spreads faster than takedowns, making enforcement weak.
- **Fragmented Laws:** No single statute codifies personality rights; remedies depend on scattered precedents.
- **Women Vulnerability:** Increasing misuse in **revenge porn and morphed images**.
- **Censorship Risk:** Overexpansion may chill satire, parody, or political critique.

Way Ahead:

- **Comprehensive Legislation**: Codify personality rights while harmonising privacy, IP, and IT laws.
- **AI Regulation:** Mandate watermarking, accountability of platforms, and liability for deepfake misuse.
- **Clear Exceptions**: Protect satire, criticism, and academic use to avoid overreach.
- **Gender-Sensitive Safeguards:** Stronger remedies for women against non-consensual digital exploitation.
- **Awareness & Registration**: Facilitate voluntary registration of celebrity attributes as intellectual property.

Conclusion:

Personality rights are emerging as a vital shield for dignity and identity in the **AI-driven digital era**. Courts have stepped in to fill the legal vacuum, but fragmented protection creates inconsistencies. A **balanced statutory framework** is essential to protect individuals while safeguarding free expression and democratic values.

THE 130TH AMENDMENT BILL: ACCOUNTABILITY OR CONSTITUTIONAL OVERREACH?

Context:

The 130th Constitutional Amendment Bill, 2025 proposes automatic removal of Ministers (including PM/CM) held in custody for 30 consecutive days in offences punishable with five years or more.

About The 130th Amendment Bill: Accountability or Constitutional Overreach?

Constitution (130th Amendment) Bill, 2025:

- Seeks to provide for **removal of PM, CMs, or Ministers** if detained in custody for serious offences.
- Applies to **Centre, States, Delhi**, and extended to **UTs of Puducherry and J&K** through separate Bills.
- **Grounds for Removal:**
  - **Serious Offence:** Accused of a crime punishable with **≥ 5 years imprisonment**.
  - **Custody Clause:** Must be under **arrest and detention for 30 consecutive days**.
- **Procedure for Removal:**
  - **Union Ministers:** Removed by the **President on PM's advice** (by 31st day).
  - **State Ministers:** Removed by the **Governor on CM's advice** (by 31st day).
  - **Delhi Ministers:** Removed by the **President on CM's advice**.
  - **PM/CM themselves:** Must **resign by 31st day** and if not, cease to hold office automatically.
- **Reappointment:**
  - **No permanent disqualification.**
  - Removed Ministers can be **re-appointed after release** from custody.
- **Key Implications:**
  - Aims to **uphold constitutional morality, good governance, and public trust**.
  - However, may risk **political misuse**, as mere custody—not conviction—triggers removal.

Constitutional & Legal Issues:

- **Basic Structure Violation:**
  - Erodes parliamentary democracy by shifting decisive power from **Parliament & Courts → executive discretion**.
  - **Kesavananda Bharati Case (1973)**: Parliament cannot alter basic features like rule of law, separation of powers.
- **Departure from Judicial Precedent:**
  - **Representation of the People Act, 1951**: Disqualification only after conviction, not pre-trial detention.
  - **A.R. Antulay Case (1988):** Procedural shortcuts affecting Article 21 rights struck down.
- **Weakening of Collegial Cabinet Principle:**
  - Council of Ministers becomes hostage to PM/CM's advice.
  - **S.R. Bommai Case (1994):** Cabinet collective responsibility upheld as part of parliamentary democracy.
- **Misuse Risk through Investigative Agencies:**
  - ED/CBI have already been accused of targeting Opposition leaders.
  - Bail is stringent under **PMLA Section 45**, custody often exceeds 30 days even without proven guilt.
- **Dilution of Liberty & Due Process:**
  - **Maneka Gandhi Case (1978):** Liberty can only be curtailed through fair, just, and reasonable law.
  - A 30-day custody trigger is arbitrary, equating mere investigation with guilt.

Comparative Perspective

- **UK:** Ministers are expected to resign if moral lapses are alleged (e.g., Profumo scandal 1963), but there is **no legal compulsion until conviction**, leaving it to political norms.
- **US:** The Constitution is **silent on ministerial removals**; resignations usually follow political pressure (e.g., Watergate 1974), not pre-trial detention.
- **South Africa:** Ministers can be removed **only after conviction or impeachment**, keeping due process central to accountability.

Potential Consequences:

- **Governance Instability:** Frequent removals without trial could disrupt Cabinet continuity and weaken policy execution.
- **Political Weaponisation:** Investigative agencies may be used to jail opponents strategically, forcing their removal without conviction.

- **Erosion of Public Mandate:** Voters' choice gets overridden by executive action, undermining representative democracy.
- **Judicial Burden:** Courts would face a flood of petitions challenging arbitrary removals, clogging judicial resources.
- **Loss of Morality Standards:** Genuine accountability risks being diluted by partisan misuse, creating cynicism about integrity in politics.

Way Forward:

- **Link Removal to Judicial Milestones:** Trigger removal only after a court frames charges, ensuring due process and filtering out frivolous arrests.
- **Strengthen Judicial Oversight:** Mandate High Courts to review removal orders within 7 days, balancing accountability with fairness.
- **Safeguard Collegiality:** Instead of unilateral PM/CM discretion, make the Cabinet collectively responsible, protecting institutional balance.
- **Ensure Political Neutrality:** Create an independent body (Lokpal/Ethics Commission) to vet such cases, reducing scope for political vendetta.
- **Promote Voluntary Codes:** Revive the practice of resigning on moral grounds (e.g., Lal Bahadur Shastri, 1956) rather than forcing legal disqualification.

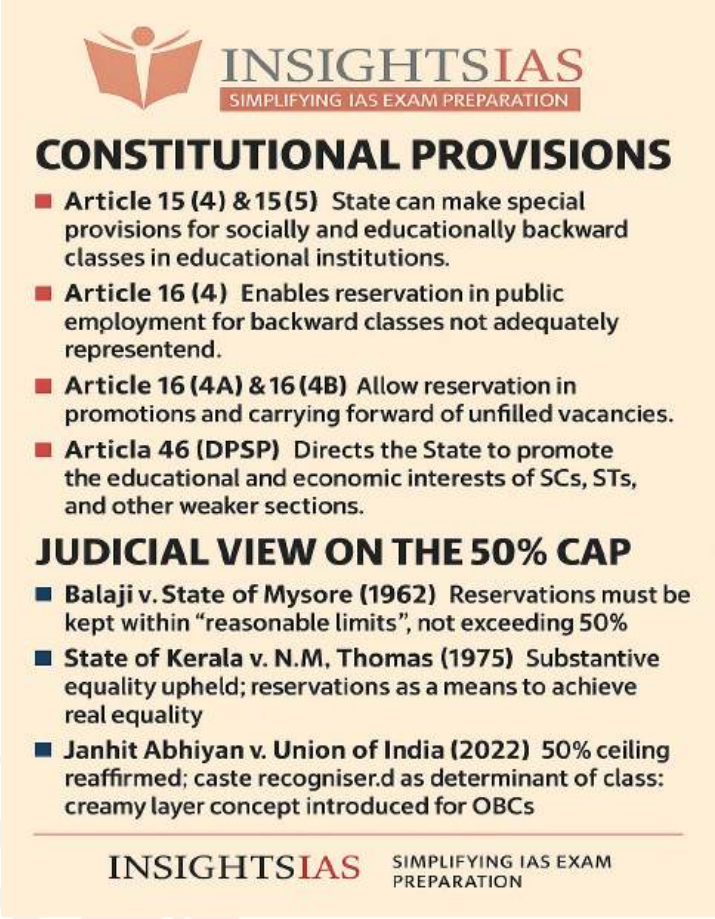
Conclusion:

The Bill attempts to address a legitimate concern – Ministers under serious charges tarnish governance. However, by equating custody with guilt, it risks executive misuse, constitutional violation, and political vendetta. Reform must be tied to judicial safeguards and due process, ensuring accountability without weakening democracy.

SHOULD INDIA RAISE RESERVATION BEYOND 50%?

Context:

The debate over whether reservations should exceed the 50% cap has resurfaced after political demands for higher quotas and the Supreme Court's notice to the Centre on extending the 'creamy layer' principle to SCs and STs.



About Should India Raise Reservation Beyond 50%?

History and Origin of the 50% Reservation Cap

1. **Constituent Assembly Debates (1946-49):**
   - Dr. B.R. Ambedkar emphasised that **reservations must remain limited** to ensure that the right to equality of opportunity is preserved for all citizens.
   - He viewed affirmative action as **temporary correctives** to historic injustices, not permanent privileges.
2. **Balaji v. State of Mysore (1962):**
   - The Supreme Court held that while Articles 15(4) and 16(4) permit reservations, they must be "reasonable" and should not **annihilate the principle of equality**.
   - It suggested that **50% is a fair limit**, marking the first judicial articulation of a ceiling.
3. **State of Kerala v. N.M. Thomas (1975):**
   - Court expanded the interpretation by recognising **substantive equality**.
   - While it did not directly address the 50% cap, it suggested that reservations are not exceptions but **extensions of equality**.
4. **Indra Sawhney v. Union of India (1992):**
   - A nine-judge Bench upheld **27% OBC quota** while firmly capping total reservations at **50%**, unless **extraordinary circumstances** exist.

- Introduced the **creamy layer principle** for OBCs, excluding the advanced sections.

5. **Recent Developments:**
   - *Janhit Abhiyan v. Union of India (2022)*: Court upheld **10% EWS reservation** for upper-caste poor, ruling that the 50% ceiling applies only to **social and educational backward class reservations**, not to economic criteria.
   - This effectively breached the 50% barrier at the central level.

Formal vs Substantive Equality

- **Formal Equality:**
  - Treats everyone the same under the law.
  - Assumes a level playing field already exists.
  - Example: Reservation as a "departure" from equality, hence capped at 50%.
- **Substantive Equality:**
  - Recognises that certain groups have faced historic and structural disadvantages.
  - Reservations are not exceptions but **tools to realise real equality**.
  - Example: N.M. Thomas judgment viewing reservations as **assertions of equality**.
- Thus, the cap reflects **formal equality**, but the demand to exceed it stems from the logic of **substantive equality**.

Should Reservation Exceed the 50% Cap?

Yes, it should increase beyond 50%:

- **Demographic Reality:** Backward classes constitute **well over 60% of India's population** (Mandal Commission estimates & state surveys), while the current 50% ceiling restricts their proportional representation.
- **Growing Political Demands:** Parties like in Bihar have proposed raising quotas to **85%**, reflecting social pressures for fairer share based on population.
- **Unequal Benefits:** **Rohini Commission (2017–23)** found that **97% of OBC benefits are cornered by 25% sub-castes**, while ~1,000 OBC castes had **zero representation**. Higher quotas with sub-categorisation could correct this imbalance.
- **Substantive Equality:** The *N.M. Thomas* case (1975) highlighted that reservations are not exceptions but **continuations of equality**, meaning numerical limits shouldn't undermine social justice.
- **State Practice:** States like **Tamil Nadu, Haryana, Maharashtra** have already legislated beyond 50%, showing that social realities often demand breaching the cap.

No, it should not increase beyond 50%:

- **Judicial Precedent:** The **Supreme Court in Indra Sawhney (1992)** reaffirmed the 50% ceiling to maintain a balance between merit and social justice, allowing exceptions only in "extraordinary circumstances."
- **Vacant Seats:** Government data shows **40–50% of reserved vacancies remain unfilled** in the central government, proving that raising the percentage won't help unless implementation improves.
- **Creamy Layer Problem:** Even within OBCs, the creamy layer was excluded; judges in **Davinder Singh (2024)** urged the same for SCs/STs. Expanding reservations without addressing this will only widen intra-caste inequalities.
- **Risk to Efficiency:** Critics argue that excessive quotas risk compromising **administrative and institutional efficiency**, especially if merit is sidelined.
- **Alternative Focus Needed:** Rather than expanding quotas, reforms like **caste census, sub-categorisation (Rohini Commission), and filling backlog vacancies** would ensure more equitable benefits.

Way Ahead:

- **Empirical Foundations:**
  - Conduct a **Caste Census (2027)** to provide accurate data for rational reservation policy.
- **Sub-Categorisation:**
  - Implement **Rohini Commission recommendations** to distribute OBC quota equitably.
  - Consider **two-tier system** for SCs/STs, prioritising the most marginalised.
- **Dynamic Cap, Not Fixed:**
  - Re-examine the 50% ceiling in light of demographic realities.
  - Allow **flexibility for States** with exceptional backward class proportions.
- **Beyond Quotas:**
  - Focus on **education, skill development, entrepreneurship, and private sector diversity**.
  - Strengthen **economic uplift schemes** alongside caste quotas.
- **Balance Equity with Efficiency:**
  - Reservation should remain a tool of **empowerment, not permanent entitlements**.
  - Ensure that **meritocracy and social justice** go hand in hand.

Conclusion:

The 50% reservation cap is a judicial limit, not a constitutional mandate. While aimed at balance and efficiency, evolving social realities call for a flexible, data-driven approach with caste census, sub-categorisation, and economic empowerment, ensuring reservations remain a tool of justice for the most marginalised rather than a political instrument.

Topics: Functions and responsibilities of the Union and the States, issues and challenges pertaining to the federal structure, devolution of powers and finances up to local levels and challenges therein.

LADAKH PROTESTS

Context:

Violent protests in Leh, Ladakh demanding statehood and Sixth Schedule status led to four deaths and over 30 injuries.

- Activist Sonam Wangchuk ended his 15-day hunger strike amid escalating unrest.

About Ladakh Protests:

Background of Ladakh Protests:

- In **2019**, after abrogation of **Article 370**, the **J&K Reorganisation Act** bifurcated Jammu & Kashmir into two UTs—J&K (with legislature) and Ladakh (without legislature).
- Initially welcomed, UT status soon created discontent as **powers of Hill Councils reduced**, **recruitment opportunities shrank**, and **land safeguards vanished**.
- Since then, the **Leh Apex Body (LAB)** and **Kargil Democratic Alliance (KDA)** have spearheaded peaceful protests, now escalating due to perceived inaction by the Centre.

Demands of Ladakhi Protesters:

- **Full Statehood** – for legislative powers, accountability, and stronger representation.
- **Sixth Schedule Inclusion** – constitutional safeguards for tribal population (90%) to protect land, jobs, and culture.
- **Parliamentary Representation** – separate **Lok Sabha seat for Kargil** and one **Rajya Sabha seat**.
- **Public Service Commission** – to conduct recruitment fairly and locally.
- **Land & Job Security** – restrictions on outsiders purchasing land or cornering employment.

Arguments for Statehood:

- **Democratic Deficit:** Without a legislature, Ladakhis are ruled by bureaucrats under the LG, leading to lack of accountability and denial of self-governance.
- **Cultural Safeguards:** Statehood with Sixth Schedule protections would ensure land, job, and cultural security for the 90% tribal population of Ladakh.
- **Geopolitical Stability:** Involving locals in governance fosters trust, ensuring peace and resilience in a frontier region bordering China and Pakistan.
- **Youth Aspirations:** Statehood promises local recruitment bodies and job creation, preventing alienation and migration of educated Ladakhi youth.
- **Promise Fulfillment:** Honouring government 2019 pledge strengthens democratic credibility and trust between the Centre and Ladakhi people.

Arguments against Statehood:

- **National Security**: Strategic location near **China (LAC) and Pakistan (LoC)** requires central control.
- **Small Population**: Around 3 lakh population may not justify full statehood.
- **Hill Councils Already Exist**: Leh and Kargil Hill Councils provide autonomy.
- **Risk of Factionalism**: Divergent interests between Leh and Kargil could destabilise governance.
- **Resource Dependency**: Heavy reliance on central funds makes full statehood financially challenging.

Government Efforts So Far:

- Formed a **High-Powered Committee** for dialogue with LAB and KDA.
- **ST reservation increased from 45% to 84%**.
- **One-third reservation for women** in Hill Councils.
- **Bhoti and Purgi** declared official languages.
- Recruitment process for **1,800 posts** initiated.

Implications of Violence:

- **On Ladakh:**
  - **Social Fabric**: Unity of Buddhists and Muslims strengthens cause but violence risks communal frictions.
  - **Youth Radicalisation:** Gen Z frustration may lead to long-term instability.
  - **Tourism & Livelihoods:** Violence hurts economy dependent on eco-tourism and Pashmina trade.

- **On India:**
  - **Security Concerns:** Protests in a border region may be exploited by China and Pakistan.
  - **Federalism Debate:** Revives questions on Centre's handling of UTs.
  - **Political Credibility:** Government image affected if promises remain unfulfilled.
  - **Diplomatic Sensitivity:** Global attention on unrest in a contested region.

Way Ahead:

- **Structured Dialogue** – continue talks with LAB & KDA through HPC with clear timelines.
- **Enhanced Autonomy** – devolve more legislative and financial powers to Hill Councils.
- **Partial Sixth Schedule** – selective application to protect land and jobs while keeping Centre's security role intact.
- **Youth Engagement** – create employment schemes, eco-tourism, and local entrepreneurship.
- **Balanced Approach** – safeguard Ladakhi identity without undermining national security priorities.

Conclusion:

Ladakh's agitation reflects the **clash between democratic aspirations and national security compulsions**. The movement has united diverse communities, but violence risks long-term instability. A **middle path of expanded autonomy, cultural safeguards, and youth empowerment** can balance people's aspirations with India's strategic interests.

Topics: Separation of powers between various organs dispute redressal mechanisms and institutions.

JUDICIAL EXPERIMENTALISM WITH SECTION 498A

Context:

The Supreme Court, in ***Shivangi Bansal vs Sahib Bansal (2025),*** endorsed the Allahabad High Court's directions introducing a two-month "cooling period" and referral to Family Welfare Committees in Section 498A (now Section 85 BNS) cases.

- This move sparked debate on **judicial experimentalism** as it may delay a victim's right to prompt justice and bypass statutory procedures.

About Judicial Experimentalism with Section 498A:

What is Judicial Experimentalism?

- **Judicial Experimentalism** refers to the practice where courts go beyond traditional interpretation of law and experiment with **new remedies, procedures, or institutional mechanisms** to address gaps, ensure justice, or resolve complex socio-legal problems.
- **Key Characteristics:**
  - **Innovative Remedies:** Courts create new frameworks (e.g., cooling periods, monitoring committees) not explicitly provided in law.
  - **Policy-Influencing Role:** Judiciary steps into domains traditionally reserved for legislature or executive.
  - **Trial-and-Error Approach:** Such directions may later be modified, diluted, or struck down based on feedback and effectiveness.
- **Examples:**
  - **Vishaka Guidelines (1997):** Supreme Court created guidelines on sexual harassment at workplace until a law was enacted.
  - **Prakash Singh Case (2006):** Directions for police reforms issued due to legislative inaction.
  - **Rajesh Sharma Case (2017):** Creation of Family Welfare Committees to screen 498A complaints (later rolled back).

About Section 498A and Judicial Safeguards:

- **Purpose of Section 498A:** Enacted in 1983 to protect women from cruelty in matrimonial homes, especially dowry harassment.
- **Concerns of Misuse:** Courts have noted rising false or exaggerated complaints leading to arbitrary arrests of husbands and in-laws.
- **Judicial Safeguards:**
  - ***Lalita Kumari vs Govt. of U.P.* (2013):** Allowed preliminary inquiry before FIR in matrimonial disputes.

- **CrPC 2008 Amendment:** Introduced the principle of necessity for arrest.
- ***Arnesh Kumar vs State of Bihar* (2014):** Issued a checklist and "notice of appearance" to curb arbitrary arrests.
- ***Satender Kumar Antil* (2022):** Strengthened bail provisions in cases of wrongful arrest.

Judicial Experimentalism: The Cooling Period Debate

- **Allahabad High Court (2022):** Directed that every 498A complaint be sent to a Family Welfare Committee (FWC) and no coercive action be taken for 2 months — intended to prevent misuse and encourage reconciliation.
- **Supreme Court (2025):** Endorsed these guidelines in *Shivangi Bansal case*, giving judicial approval to the concept of a mandatory "cooling period" before legal action.

Concerns:

- **Delay in Justice:** Victims are left waiting for relief while facing continued harassment, undermining the purpose of filing an FIR.
- **Jurisdictional Overreach:** FWCs have no statutory recognition; this bypasses the legal framework of BNS and CrPC.
- **Past Precedent:** The 2017 *Rajesh Sharma* FWC directions were struck down in *Social Action Forum* (2018) as regressive and beyond judicial competence.

Implications of the Ruling:

- **Positive Aspects:**
  - **Protection from False Cases:** Safeguards innocent husbands and families from arbitrary arrest and social stigma.
  - **Encourages Reconciliation:** Gives parties time to attempt amicable settlement before escalating to criminal proceedings.
- **Negative Aspects:**
  - **Denial of Timely Justice:** Victims are deprived of immediate protection such as restraining orders or arrests of abusers.
  - **Erosion of Autonomy:** Police and magistrates lose discretion, affecting their statutory role in criminal justice.
  - **Legislative Overreach:** Judiciary ends up creating a new procedure not sanctioned by Parliament.
  - **Psychological Trauma:** Waiting period may demoralize victims, leading to mental distress and underreporting of genuine cases.

Balancing Judicial Innovation and Victim's Rights:

- **Statutory Backing:** ADR or reconciliation mechanisms should be legislated to ensure clarity and accountability.
- **Police Sensitization:** Training police to follow *Arnesh Kumar* guidelines will check wrongful arrests without slowing justice delivery.
- **Fast-Track Courts:** Dedicated matrimonial courts can ensure speedy hearings without imposing cooling periods.
- **Victim-Centric Approach:** Urgent relief like shelter, protection orders, and medical help must not be delayed.

Way Forward:

- **Revisit the Ruling:** The SC must reconsider the decision in light of *Social Action Forum* (2018) to protect access to justice.
- **Legislative Clarity:** Parliament should clearly define procedures balancing protection of innocents and victims' rights.
- **Awareness & Mediation:** Encourage voluntary pre-litigation mediation as an option, not a compulsion.
- **Data-Driven Policy:** NCRB trends show arrests are already declining — indicating current safeguards are effective without additional hurdles.

Conclusion:

The judiciary must walk a fine line between innovation and overreach. While preventing misuse of Section 498A is a legitimate concern, access to speedy justice is a constitutional right under Article 21. Judicial experimentalism must complement, not compromise, the rule of law.

Topics: Comparison of the Indian constitutional scheme with that of other countries

INDIA VS FRENCH VOTE OF CONFIDENCE

Context:

France is facing a major political crisis as PM François Bayrou is expected to lose a confidence vote, triggered by unpopular austerity measures.

About India vs French Vote of Confidence:

French Semi-Presidential System (Fifth Republic)

- France follows a **semi-presidential system** under the Constitution of 1958, crafted to end instability of the Fourth Republic. It combines elements of both presidential and parliamentary systems, creating a **dual executive** — a directly elected President and a Prime Minister responsible to Parliament.

Core Features:

- **Dual Executive:**
  - **President (Head of State):** Directly elected by citizens for a 5-year term. Commands strong powers in foreign affairs, defence, dissolution of Parliament, and referendums.
  - **Prime Minister (Head of Government):** Appointed by the President but must enjoy confidence of the National Assembly. Handles domestic and day-to-day governance.
- **President's Powers:**
  - **Appoints PM and presides over Council of Ministers.**
  - **Dissolves National Assembly** and calls fresh elections.
  - **Holds emergency powers** under Article 16 in case of institutional crisis.
  - Plays a dominant role in **defence and foreign policy.**
- **Prime Minister & Government Powers:**
  - Directs **domestic policy and administration.**
  - Accountable to Parliament — can be removed through a **no-confidence motion.**
  - Uses tools like **Article 49-3**, which allows passing a bill unless the Assembly votes no-confidence.
  - Leads law-making in partnership with Parliament.
- **Parliament:**
  - Bicameral: **National Assembly** (directly elected) + **Senate** (indirectly elected).
  - The Assembly has the final say on most laws and can bring down the Government.
  - Powers are "rationalised" — procedures limit deadlock and enhance executive stability.
- **Cohabitation:**
  - Occurs when the President and Assembly majority belong to different political camps.
  - President retains influence in foreign affairs, while PM dominates domestic policy.
  - Though rare after 2000 reforms aligning presidential and legislative elections, it remains a hallmark of the system.
- **Reforms:**
  - **2000:** Presidential term reduced to 5 years (from 7) to align with Assembly polls, reducing cohabitation chances.
  - **2008:** Strengthened Parliament's powers and restricted frequent use of Article 49-3.

Why "Semi-Presidential"?

- **Not fully Presidential (like U.S.):** because the Government is answerable to Parliament.
- **Not purely Parliamentary (like U.K.):** because the President wields independent, direct powers from the people.
- Hence, it blends both systems — strong executive leadership with parliamentary responsibility.

Vote of Confidence: India vs France

India (Parliamentary System)

- **Who faces it?**
  - The **Council of Ministers (PM + Ministers)** collectively.
- **Process:**
  - Introduced in the Lok Sabha (Lower House).
  - If the Government loses majority, opposition can move a **No-Confidence Motion** under Rule 198 of Lok Sabha rules.
    - **Article 75(3)** – The Council of Ministers shall be collectively responsible to the Lok Sabha.
  - Passed by **simple majority** of members present and voting.
- **Consequence:**
  - If defeated, the **entire Council of Ministers must resign.**
  - President then invites another leader with majority support or dissolves the Lok Sabha.

France (Semi-Presidential System, Fifth Republic)

- **Who faces it?**
  - The **Prime Minister & Cabinet**, not the President.
- **Process:**
  - Article **49(2)** of the 1958 Constitution allows the National Assembly to move a **Motion of Censure** (equivalent to no-confidence).
  - Requires **absolute majority of all Assembly members** (harder to achieve than India).
- **Government's Own Confidence Vote (Article 49-1 & 49-3):**
  - PM can tie a bill's passage to a **vote of confidence** (Article 49-3).
  - If Assembly rejects it, government must resign. If not, bill is considered passed automatically.
- **Consequence:**
  - If government loses, **PM and Cabinet resign** but the **President stays in office**.
  - President then appoints a new PM (sometimes from opposition during "cohabitation").

Key Differences

Aspect	India	France
Type of System	Pure Parliamentary	Semi-Presidential
Who Holds Confidence?	Entire Government (PM + Cabinet)	Government (PM + Cabinet), not the President
Initiation	No-confidence motion by opposition MPs	Motion of Censure by Assembly MPs
Majority Needed	Simple majority of those present & voting	Absolute majority of total members
Impact of Defeat	Entire Government resigns; Lok Sabha dissolved if no alternative	Only PM + Cabinet resign; President continues
Extra Provision	Only Parliament can test majority	Article 49-3 allows PM to push bills tied to confidence vote

Conclusion:

In India, the government's survival depends entirely on the confidence of Parliament, ensuring direct accountability. In France, only the Prime Minister and Cabinet are accountable, while the President remains unaffected. This contrast highlights India's parliamentary supremacy versus France's dual executive balance.

Topics: Appointment to various Constitutional posts, powers, functions and responsibilities of various Constitutional Bodies.

INTEGRITY IN PUBLIC OFFICE

Context:

Assam Civil Service officer **Nupur Bora** was arrested for possessing assets allegedly 400 times her known income.

- A six-month CM Vigilance Cell probe led to seizure of over **₹2 crore in cash and jewellery**, exposing a serious breach of public trust.

About Integrity in Public Office:

What it is?

Integrity in public office means **consistent adherence to moral, ethical, and legal standards** in discharging official duties. It is about aligning **public power with public interest** rather than private gain

Key Features of Integrity:

- **Probity & Honesty:** Acting with moral uprightness and refusing to accept undue advantage ensures zero tolerance for corruption.
- **Accountability:** Every decision must withstand audit, public scrutiny, and legal challenge, promoting responsible governance.
- **Impartiality:** Officials must avoid bias or conflict of interest and provide equal treatment to all citizens.
- **Transparency:** Decisions, finances, and processes must be open and easily accessible to enhance trust.
- **Rule of Law:** All actions must be consistent with the Constitution and legal provisions, ensuring fairness and justice.

Ethical Theories Underpinning Integrity:

- **Deontological Ethics:** Focuses on duty — officials must follow rules and moral obligations regardless of outcomes (Kantian philosophy).
- **Utilitarian Ethics:** Emphasizes maximizing collective welfare and minimizing harm while making decisions.
- **Virtue Ethics:** Stresses character traits like honesty, courage, and fairness as guiding principles for conduct.
- **Social Contract Theory:** Views public office as a trust

— power is legitimate only when exercised in public interest.

Importance of Integrity in Public Offices:

- **Public Trust:** Builds citizen confidence in governance, ensuring higher compliance and cooperation.
- **Efficient Service Delivery:** Reduces leakages, ensures optimal use of resources, and improves welfare outcomes.
- **Economic Growth:** Clean governance lowers corruption costs and attracts domestic and foreign investment.
- **Rule of Law:** Reinforces equality before law, discouraging favoritism and patronage networks.
- **Moral Leadership:** Civil servants become role models, inspiring ethical behaviour in society.

Challenges to Integrity:

- **Weak Enforcement:** Delays in vigilance inquiries and departmental action allow unethical behaviour to continue.
- **Opaque Processes:** Lack of timely disclosure of assets or decisions creates opportunities for corruption.
- **Political Patronage:** Errant officers may be shielded through political interference or transfers.
- **Low Deterrence:** Slow trials and weak conviction rates reduce fear of punishment.
- **Organized Corruption Networks:** Nexus of officials, contractors, and middlemen institutionalizes corruption.

Role of Prevention of Corruption (Amendment) Act, 2018:

- **Wider Definition:** Expands the meaning of "undue advantage" to cover cash, gifts, favours, and non-monetary gratifications.
- **Bribe Givers Punishable:** Makes giving a bribe an offence while protecting coerced whistleblowers from prosecution.
- **Corporate Liability:** Holds companies responsible for employee bribery unless they prove adequate preventive systems.
- **Time-bound Trials:** Ensures corruption cases are concluded within two years (extendable to four), creating quick deterrence.
- **Attachment of Property:** Allows seizure and confiscation of illicit assets, depriving wrongdoers of illegal gains.

Way Ahead:

- **Strengthen Internal Vigilance:** Provide autonomy and resources to vigilance cells, Lokayuktas, and CVC for proactive investigation.
- **Digital Transparency:** Mandate online declaration of assets and create public dashboards for postings and transfers.
- **Capacity Building:** Regular ethics and integrity training to sensitize officials about probity and accountability.
- **Swift Justice:** Establish special courts for quick disposal of disproportionate asset cases and corruption trials.
- **Whistleblower Protection:** Enforce Whistleblower Protection Act effectively to encourage reporting of corruption safely.

Conclusion:

Integrity is the **soul of public service**—its absence corrodes governance from within. The Nupur Bora case is a wake-up call to tighten preventive vigilance, accelerate punitive action, and foster an ethical culture. A value-driven bureaucracy, supported by legal reforms like PCA 2018 and systemic vigilance, is essential for realizing the vision of a **corruption-free, citizen-centric state**.

Topics: Welfare schemes for vulnerable sections of the population by the Centre and States and the performance of these schemes.

FROM PROMISES TO PARTICIPATION: REIMAGINING TRANSGENDER RIGHTS IN INDIA

Context:

Recently leading trans activist, argued that India must move from symbolic welfare promises to genuine participation of transgender persons in politics and policymaking.

Despite legal recognition since NALSA (2014), the gap between rights on paper and lived realities remains stark.

About From Promises to Participation: Reimagining Transgender Rights in India:

What is the Issue?

- Legal recognition vs lived reality: The NALSA v. Union of India (2014) judgment recognised transgender persons as the "third gender" under Articles 14, 15, 19, and 21. Yet, exclusion and stigma persist.
- Tokenistic quotas: Announced quotas in jobs, education, and housing remain inaccessible due to corruption, humiliating verification, and bureaucratic hurdles.
- Lack of political voice: No trans MPs or Union ministers exist; exclusion from statutory boards (e.g., censor board) means policies are framed about trans persons but rarely with them.
- Everyday discrimination: Landlords refuse rentals, workplaces marginalise, and ridicule in buses or markets makes dignity a daily struggle.
- Economic vulnerability: Gender transition costs ₹2–5 lakh in private hospitals; coupled with family abandonment, many are pushed into unsafe livelihoods.

What are the Implications?

- Democratic deficit: Without structural political participation, democracy reproduces privilege.
- Eg: Women and SC/ST have reservations in Panchayats, but trans persons lack such entry points.
- Loss of human capital: As Apsara Reddy notes, "Every time a trans person is denied education, a scientist is lost; every time housing is denied, an artist is displaced."
- Cycle of poverty: NHRC survey (2017) found 92% of trans persons are denied jobs, and nearly 50% face workplace harassment.
- Social injustice: NCRB data shows trans persons face higher vulnerability to violence; WHO reports elevated suicide risks among trans youth.
- Developmental setback: Exclusion wastes diversity that historically drives reform.
- Eg: Women's entry into universities advanced medicine; Dalits' entry into legislatures deepened democracy.

What Has Been Done?

- Judicial recognition: NALSA (2014) affirmed right to self-identify and directed governments to extend reservations.
- Legislation: Transgender Persons (Protection of Rights) Act, 2019 prohibits discrimination but is criticised for requiring District Magistrate certification.
- Institutional framework: National Council for Transgender Persons (2020) created to advise policy.
- State-level initiatives:
- Tamil Nadu: Aravanis Welfare Board (2008), monthly pensions.
- Karnataka: 1% reservation (2021) in education and jobs.
- Kerala: State-funded aid for gender reassignment surgeries.
- Symbolic representation: Shabnam Mausi (first trans MLA, 1998), Joyita Mondal (first trans judge, 2017), and Madhu Bai Kinnar (Mayor, 2015) broke barriers but remain exceptions.

What More Needs to be Done?

- Education: Scholarships, inclusive curricula, hostels, and anti-bullying protocols must be institutionalised.
- Eg: NCERT's 2021 inclusion of gender identity in textbooks should be expanded nationwide.
- Healthcare: Affordable, state-supported transition procedures, insurance under Ayushman Bharat, and targeted mental health counselling are essential.
- Eg: Kerala's policy for gender reassignment surgery aid is a replicable model.
- Employment & Housing: Strict enforcement of anti-discrimination laws with penalties, rental protections, and skilling under Skill India are needed.
- Eg: Karnataka's 1% reservation proves feasibility of affirmative action.

Political representation:

- Reserved seats in local bodies, nomination in legislatures, and inclusion in statutory boards like the censor board are vital.

  Eg: Despite recurring derogatory portrayals, no trans person has been appointed to the censor board.

Social sensitisation:

- Mass campaigns, neighbourhood awareness, and affirmative media narratives must dismantle stereotypes.

  Eg: Just as Swachh Bharat reshaped sanitation attitudes, similar campaigns can normalise gender diversity.

Conclusion:

Policy for gender minorities must move from symbolic welfare to structural inclusion. Ensuring rights in education, healthcare, housing, employment, and political

representation is essential. Only when trans persons are integrated into India's democratic fabric will the constitutional promise of dignity and justice be realised.

AGEING AND HEALTH BURDEN IN INDIA

Context:

The India Ageing Report 2023 highlights the mounting challenges of healthcare costs for senior citizens in India, especially amidst rising comorbidities, low insurance coverage, and inadequate financial preparedness.

About Ageing and Health Burden in India:

Background:

- India's elderly population (60+) stood at ~149 million in 2022; projected to reach **347 million (20.8%) by 2050**.
- Elderly face a "double burden":
  - **Health** – multiple comorbidities such as diabetes, hypertension, heart disease, arthritis, stroke.
  - **Finance** – reduced income, high dependency, poor social security.
- Out-of-pocket expenditure (OOPE) remains high (~48% of total health spending, National Health Accounts 2021-22), causing distress financing and debt.

Major Health Concerns of the Elderly:

- **Out-Patient Care:** Elderly frequently seek treatment for chronic pain, fever, hypertension, diabetes, and breathing/heart issues, reflecting the burden of non-communicable diseases.
- **In-Patient Care:** Hospitalisation is commonly required for heart disease, stroke, diabetic complications, infections, and surgeries, increasing financial and physical stress.
- **Recovery Issues:** Longer hospital stays, repeated infections, ICU needs, and poor drug compliance due to costs make recovery slower and more difficult.

Insurance Coverage: Present Status and Gaps

- **Schemes Available:** Central (PM-JAY) and state schemes like CMCHIS, along with CGHS, ESIC, and private health insurance, provide varying levels of coverage.
- **Coverage Remains Low:** Only 20% of elderly are insured, with higher coverage among men and urban residents compared to women and rural populations.
- **Barriers:** Low awareness (52.9%), high premiums, and complex enrolment processes restrict access to health insurance.
- **Exclusions:** Key services like palliative care, physiotherapy, rehabilitation, and home oxygen support are not covered, forcing out-of-pocket spending.

Cost of Healthcare: Why It Rises with Age?

- **Chronic NCDs:** Lifelong conditions like diabetes and hypertension require constant medication and monitoring, raising cumulative expenses.
- **ICU/Critical Care:** Comorbidities in elderly patients often demand high-cost ICU admissions and ventilatory support.
- **Private Insurance Premiums:** Premiums rise steeply with age, while reimbursements are often partial (about 75%), leaving large gaps.
- **Post-Treatment Costs:** Rehabilitation, physiotherapy, and home-based care after discharge are typically uncovered and expensive.
- **End-of-Life Care:** No structured policy for palliative or terminal care leaves families bearing heavy financial burdens.

Initiatives Taken:

- **PM-JAY Expansion (2024):** Provides universal health coverage for all citizens above 70, regardless of income.
- **State Schemes Integration:** States like Tamil Nadu integrate local schemes (CMCHIS) with PM-JAY to widen access.
- **NPHCE:** Establishes geriatric clinics and regional centres for elderly-specific care across the country.
- **Health Insurance Reforms:** Simplification of enrolment and broader coverage aims to boost participation among elderly.
- **Public Hospital Strengthening:** States such as Kerala and Tamil Nadu have improved public geriatric healthcare infrastructure.

Challenges:

- **High OOPE:** Nearly half of healthcare costs are out-of-pocket, devastating for elderly with limited or no income.
- **Rural-Urban Divide:** Urban elderly access private hospitals and insurance, while rural elderly largely depend on household savings.

- **Insurance Gaps:** High premiums, exclusions, and low awareness make insurance inaccessible for most senior citizens.
- **Workforce Shortage:** India has only ~6,000 trained geriatricians, insufficient for its rapidly ageing population.
- **Palliative & Preventive Neglect:** Preventive measures like vaccination and palliative care remain underfunded and poorly integrated.
- **Gender Inequality:** Elderly women are less likely to have insurance or financial support, heightening their vulnerability.

Way Forward:

- **Financial Protection:**
  - Expand **Ayushman Bharat** to include **palliative, rehabilitative, and home-based care**.
  - Regulate private insurers to cap premiums for elderly.
  - Incentivise middle-age savings for healthcare (tax-deductions, health bonds).
- **Accessibility:**
  - Strengthen **public hospitals** for geriatric care (model of TN & Kerala).
  - Rural outreach through **Health & Wellness Centres** under Ayushman Bharat.
- **Preventive Health:**
  - National vaccination policy for elderly (influenza, pneumonia, shingles).
  - Early screening for diabetes, hypertension, cancers at PHCs.
- **Awareness & Literacy:**
  - Nationwide awareness campaigns on health insurance.
  - Simplified enrolment procedures, mobile units for rural elderly.
- **Human Resources:**
  - Establish geriatric departments in medical colleges.
  - Train ASHA workers and primary health staff in geriatric care.

Conclusion:

India is becoming an ageing society, making elderly healthcare vital for inclusive growth. The India Ageing Report 2023 urges urgent reforms in affordability, accessibility, and insurance. True to Dr. Ambedkar's vision of equality, today's challenge is dignity in ageing—ensuring the elderly live with health, security, and respect, free from debt or neglect.

Topics: Issues relating to development and management of Social Sector/Services relating to Health, Education, Human Resources.

EQUALISING PRIMARY FOOD CONSUMPTION IN INDIA

Context:

The 2024 NSS Household Consumption Survey revealed that nearly 50% of rural India and 20% of urban India cannot afford two thalis a day, despite low poverty levels.

- Experts propose restructuring PDS to equalise primary food consumption, especially pulses.

About Equalising Primary Food Consumption in India:

What is Primary Food Consumption?

- **Definition:** The basic minimum food intake required to ensure energy, protein, and micronutrient sufficiency for a healthy life.
- **Components:** Cereals (carbs), pulses (protein), vegetables (vitamins), fats (energy), and milk/curd (calcium).
- **Metric Used:** *Thali index* – a standard South Asian meal combining rice/roti, dal, vegetables, curd, and salad.

Features of Primary Food Consumption

- **Balanced Nutrition:** Goes beyond calories, ensures carbs–protein–micronutrient mix for growth & immunity.
- **Universal Baseline:** Represents minimum desirable consumption standard for all citizens.
- **Affordability Sensitive:** Reflects what people can actually buy after meeting other expenses (rent, health, transport).
- **Equity-Oriented:** Serves as a benchmark to assess disparities in access to essential food items.
- **Policy-Relevant:** Provides a realistic yardstick for PDS design and subsidy targeting.

Understanding Primary Food Consumption:

- **Current Reality:**

- Nearly **50% of rural** and **20% of urban India** cannot afford two thalis/day at market prices.
- PDS reduces deprivation but does not cover **pulses adequately**, leaving protein gaps.

- **Cereal Equality:** Consumption of rice & wheat nearly equal across rich and poor — PDS has succeeded in equalising cereals.
- **Pulses Gap:** Bottom 5% consume **half the pulses** of top 5%, highlighting **protein deprivation**.
- **Policy Implication:** Expand PDS to include pulses, trim unnecessary cereal subsidy for high-consumption groups.
- **Outcome Goal:** Raise the poorest household's nutrition to match the highest observed level, achieving **true food equity**.

Public Distribution System – Present Context:

- **Achievements:** PDS has succeeded in equalising **cereal consumption** across classes — even the richest consume similar quantities of rice/wheat.
- **Gaps:** Despite near-universal cereal coverage, **protein deficiency** persists among the poorest (0–5% fractile consume half the pulses eaten by top 5%).
- **Inefficiencies:** 80% of population receives cereals (including those above food adequacy levels), straining FCI stocking and fiscal resources.
- **Urban-Rural Divide:** Urban subsidies are relatively progressive, but rural subsidies disproportionately benefit higher-expenditure households.
- **Policy Overhang:** Large cereal entitlements do not match actual consumption needs → excess stocks & economic inefficiency.

Challenges in Equalising Food Consumption:

- **Fiscal Stress:** Universal cereal subsidies cost exchequer significantly, leaving little room for pulses and nutrition diversification.
- **Nutritional Deficit:** India faces **protein-energy malnutrition**, anaemia, and stunting despite cereal security.
- **Logistics:** Transporting pulses regularly and maintaining buffer stocks require robust infrastructure and price stabilisation.
- **Targeting Errors:** Leakages, inclusion of non-poor, and exclusion errors distort benefits.
- **Behavioural Factors:** Dietary choices influenced by culture, affordability, and awareness may limit uptake even when pulses are available.

Policy Proposal – Restructuring PDS for Nutrition Security

- **Rationalise Cereal Entitlement:** Trim rice/wheat allocation to match **actual per-capita requirement** of lower deciles.
- **Diversify Basket:** Include pulses, millets, fortified oil, and iodised salt to ensure **balanced nutrition**.
- **Remove Top-End Subsidies:** Eliminate free/subsidised cereals for top 20% consumption fractile, freeing fiscal space.
- **Dynamic Targeting:** Use **Aadhaar + SECC data** to ensure updated beneficiary lists.
- **Leverage Technology:** GPS-enabled grain movement, DBT for pulses, and e-POS for better monitoring.

Way Forward:

- **Nutrition-First Approach:** Shift from calorie security to **protein and micronutrient security**.
- **Pulse Procurement Missions:** Expand procurement under NFSM; incentivise farmers to grow pulses in rice fallows.
- **Fiscal Prudence:** Redirect savings from rationalised cereal subsidy to **nutrition programmes** (ICDS, PM Poshan).
- **Community Kitchens:** Expand *Anna Canteens* and *Tamil Nadu's Amma Canteens* model for affordable thali meals.
- **Public Awareness:** Educate citizens on balanced diets, protein needs, and millet consumption.

Conclusion:

India's success in **cereal security** must now evolve into **nutrition security**. Rationalising PDS subsidies, adding pulses, and targeting the truly deprived can bridge the protein gap and **equalise food consumption**. A compact, efficient, and nutrition-sensitive PDS can make India a **global model for ending hidden hunger**.

EDUCATION EXEMPTION FOR MINORITY SCHOOLS AND THE RTE DEBATE

Context:

The Supreme Court recently questioned the validity of the 2014 Pramati Educational and Cultural Trust judgment, which exempted minority schools — aided and unaided — from the Right to Education (RTE) Act.

About Education Exemption for Minority Schools and the RTE Debate:

Right to Education Act (2009): Aims and Mandates

- Operationalises **Article 21A**, guaranteeing free and compulsory education for children aged 6–14.
- Requires:
  - Government schools: free education for all.
  - Aided schools: free seats proportionate to government aid.
  - **Private unaided schools:** reserve 25% of entry-level seats for disadvantaged children (Section 12(1)(c)).
- Sets norms for pupil-teacher ratios, infrastructure, teacher eligibility, and prohibits corporal punishment/capitation fees.
- It is **child-centric**, designed to promote equality, social justice, and democracy through inclusive classrooms.

The 2014 *Pramati* Judgment:

- A **5-judge Constitution Bench** held that applying RTE to minority institutions violated **Article 30(1)** (minority rights to establish and administer institutions).
- It exempted both aided and unaided minority schools from RTE provisions, especially the 25% quota.
- Fallout: many schools sought "minority" status, diluting the spirit of inclusion.

What's the Contention Now?

- **Blanket Exemption from RTE (2014 *Pramati* Judgment)**
  - Minority institutions — both aided and unaided — were given complete immunity from the Right to Education Act (2009).
  - This meant they did not have to follow key provisions like the **25% reservation for disadvantaged groups (Section 12(1)(c))**, teacher eligibility norms, or infrastructure standards.
- **Problem with the Exemption**
  - Led to **misuse of minority status** by many private schools seeking to avoid RTE compliance.
  - Resulted in **erosion of inclusivity**, denying disadvantaged children access to quality education.
  - Created a **regulatory loophole**, undermining the universal character of **Article 21A (Right to Education)**.

2025 Court Judgement:

- **Bench Observations**
  - A **two-judge bench led by Justice Dipankar Datta** held that *Pramati* went "too far" in granting absolute immunity.
  - Said that **Articles 21A and 30 must co-exist**, and children's rights cannot be sidelined for institutional autonomy.
- **On the 25% Quota**
  - The bench suggested a **case-by-case approach** rather than blanket exemption.
- **On Inclusivity**
  - Warned that the exemption **erodes the balance between autonomy and public interest**.
  - Emphasised that **RTE is child-centric, not institution-centric**, and exemptions weaken its intent.
- **Next Step**
  - Since a **larger bench** (five or more judges) can only overturn *Pramati*, the matter has been **referred to the Chief Justice of India** for constitution of a bigger bench.

Challenges in Correcting RTE–Minority Exemption:

- **Legal Precedent** – *Pramati (2014)* is a Constitution Bench ruling; only a larger bench can overturn it, delaying reform.
- **Autonomy vs Inclusivity** – Balancing minority rights under **Article 30** with children's right to education under **Article 21A** is constitutionally complex.
- **Weak Enforcement** – Even where RTE applies, poor compliance on quotas, infrastructure, and teacher norms undermines outcomes.
- **Social Resistance** – Elite parents and institutions resist socio-economic mixing in classrooms, making implementation politically sensitive.

Implications:

- **On Education & Children**
  - Denial of access for disadvantaged groups to elite minority schools.
  - Weakens the **democratic ethos** of shared classrooms.
  - Undermines the **philosophy of equity** in education policy.

- **On Constitutional Values**
  - Skews interpretation of **Articles 21A and 30**, privileging group rights over individual rights.
  - Dilutes **constitutional morality** of equality and social justice.
- **On Governance & Society**
  - Creates regulatory loopholes for misuse of minority status.
  - Exacerbates **inequality in schooling outcomes**, weakening India's human capital base.
  - Erodes trust in state's commitment to universal education.

Way Forward:

- **Judicial Rebalancing**
  - Larger bench must harmonise Articles 21A and 30 to ensure inclusivity.
  - Clarify that autonomy ≠ immunity from child-centric standards.
- **Policy Realignment**
  - Mandate at least **teacher qualification and infrastructure norms** for all institutions.
  - Quotas could be adapted — e.g., prioritising disadvantaged children from the same minority.
- **Strengthen Public Education**
  - Ensure government schools deliver quality, reducing over-reliance on private/minority schools.
  - Investment in equity-based education as per **NEP 2020**.
- **Promote Diversity as a Value**
  - Social campaigns to highlight classrooms as spaces of democratic socialisation.
  - Encourage acceptance of mixed socio-economic schooling.

Conclusion:

The exemption of minority schools from RTE is not merely a legal debate — it is a test of India's **constitutional morality**. Upholding the child's right to inclusive education must take precedence over institutional privileges. The Supreme Court now has the opportunity to ensure that **Articles 21A and 30 co-exist in harmony**, reaffirming that education is not a privilege but a universal right essential to democracy.

Topics: Important aspects of governance, transparency and accountability, e-governance applications, models, successes, limitations, and potential; citizens charters, transparency & accountability and institutional and other measures.

MANA MITRA: ANDHRA PRADESH'S WHATSAPP GOVERNANCE MODEL – A BLUEPRINT FOR DIGITAL INDIA

Context:

Andhra Pradesh expanded its WhatsApp Governance platform '**Mana Mitra'** to offer 200+ citizen services, now covering 738 services across 36 departments, and the Centre plans to replicate this model nationwide after recognizing it as a best practice.

About Mana Mitra: Andhra Pradesh's WhatsApp Governance Model – A Blueprint for Digital India

What it is?

- Mana Mitra is India's **first WhatsApp-based governance platform**, launched by the Andhra Pradesh government in January 2025 to deliver public services digitally. It integrates **36 state departments** into a single window for citizens, reducing the need to visit government offices.

Objectives:

- **Ease of Access:** Reduce physical visits to government offices and deliver services on a widely used platform.
- **Transparency & Trust:** QR-coded certificates linked to official websites eliminate fake documentation.
- **Inclusivity:** Empower rural citizens with mobile-first governance tools.

How it Works?

- **Single Number Access:** Citizens send a message to **9552300009** on WhatsApp.
- **Menu-Driven Service:** A chatbot presents available services (education, revenue, RTC, endowments, tourism, tax payments, etc.).
- **Instant Document Delivery:** Certificates (like

income, caste, hall tickets) are delivered digitally with **QR code verification**.

- **Real-Time Governance Dashboard:** Tracks requests and service delivery for transparency.
- **Next-Gen Tech Integration:** Future upgrades include **AI chatbots, voice-based services, and blockchain authentication** for secure, seamless transactions.

Key Features:

- **Wide Service Coverage:** 738 services from 36 departments including education, revenue, RTC, endowments, tourism, and health are integrated.
- **Ease of Use:** Citizen's type "Hi" to start; hall tickets, income certificates, and tax payments are sent digitally.
- **Security & Transparency:** QR codes on certificates verify authenticity; blockchain tech under implementation.
- **Meta Partnership:** MoU with Meta ensures global-class backend infrastructure and security features.
- **Tech Upgrades:** AI chatbots, voice-based assistance, and real-time governance dashboards planned in Phase-II.

Significance & Impacts:

- **Citizen-Centric Governance:** Puts governance literally in the citizen's hands, removing middlemen and long queues, aligning with *Minimum Government, Maximum Governance*.
- **Cost & Time Savings:** Saves travel and paperwork expenses while reducing government processing costs through automation and paperless delivery.
- **Digital Inclusion:** Leverages WhatsApp's ~500M users in India, ensuring rural citizens can access services without needing complex apps or portals.
- **Administrative Efficiency:** Real-time dashboards allow quick monitoring, faster approvals, and timely grievance redressal, improving trust in government.
- **Replicability:** Recognized by DARPG as a national model, paving the way for similar platforms across states and eventually at the Union level.

Challenges:

- **Digital Divide:** Tribal belts and remote villages still face connectivity gaps; this can exclude the most vulnerable if not addressed.
- **Cybersecurity Risks:** The risk of phishing scams or fake WhatsApp accounts requires secure verification and strong encryption.
- **Capacity Building:** Frontline staff need training to handle queries digitally and resolve complaints promptly.
- **Data Privacy:** Must ensure compliance with *Digital Personal Data Protection Act (DPDPA) 2023* to avoid misuse of citizens' sensitive data.
- **Scalability:** Backend systems must be robust enough to handle lakhs of simultaneous service requests without crashing.

Way Forward:

- **Expand AI Integration:** Deploy AI chatbots and voice bots for predictive service delivery and multilingual support.
- **Strengthen Cybersecurity:** Introduce two-factor authentication and blockchain-backed verification for certificates.
- **Digital Literacy Drives:** Conduct awareness campaigns, training women, elderly, and marginalized groups to use the platform.
- **Legislative Backing:** Pass a legal framework to institutionalize WhatsApp governance and ensure accountability.
- **Replicate Nationwide:** Link with DigiLocker, UPI, and CoWIN for a unified citizen service platform accessible across India.

Conclusion:

Mana Mitra is a pioneering model that redefines **citizen–state interaction**, setting new benchmarks for digital governance. By combining accessibility, transparency, and scalability, it brings governance to people's fingertips. If replicated nationwide, it can become a cornerstone of Viksit Bharat 2047's **Digital Governance Vision**.

NITI AAYOG'S 'AI FOR VIKSIT BHARAT ROADMAP'

Context:

NITI Aayog launched the 'AI for Viksit Bharat Roadmap' and 'Frontier Tech Repository' under its Frontier Tech Hub.

About NITI Aayog's AI for Viksit Bharat Roadmap:

What it is?

A **comprehensive national blueprint** to harness Artificial Intelligence (AI) as a growth accelerator.

- **Focus:** Productivity enhancement, sector-specific AI adoption, innovation-driven R&D.

- **Objective:** Bridge 30–35% of India's growth gap to achieve sustained **8%+ GDP growth** by 2035.
- **Approach:**
    1. Accelerate AI adoption in key industries (banking, manufacturing, pharma, auto).
    2. Transform R&D with generative AI to leapfrog innovation.
    3. Strengthen data, compute, talent, and governance infrastructure for inclusive growth.

Key Summary of Report:

1. **AI's Economic Potential:** Can add **$500–600B** to GDP by 2035 through productivity gains and efficiency
2. **Sectoral Priority:** Banking & manufacturing could derive **20–25% of sectoral GDP** from AI; pharma & auto identified for leapfrog innovation
3. **Data Capital of the World:** India to become global hub of **trusted, anonymized data ecosystems** through AI Kosh, sectoral data grids, and DPI integration
4. **AI Skilling Ecosystem:** Plans for **AI Open University**, AI Chairs in top institutes, national certification programs, and workforce reskilling to close skill gaps
5. **Generative AI in R&D:** Can cut drug discovery timelines by **60–80%**, speed automotive design validation, and reduce costs of innovation
6. **Frontier Tech Repository:** 200+ case studies in **agriculture, healthcare, education, and national security** to inspire states & districts
7. **Frontier 50 Initiative:** Support for **50** aspirational districts to implement frontier tech solutions for service saturation
8. **Impact Awards:** Recognition for top 3 states leveraging technology for governance, education, health & livelihood transformation

India's Opportunity:

- **Demographic Dividend:** Large STEM workforce to lead global AI innovation and service exports.
- **Digital Public Infrastructure (DPI):** UPI, Aadhaar, ABHA, and Account Aggregator create scalable AI use cases.
- **Global AI Hub Potential:** AI Kosh + 38,000+ GPU compute network can attract global R&D investments.
- **Export Competitiveness:** AI-enabled manufacturing, pharma, and auto components can boost India's share in global value chains.
- **Inclusive Growth:** AI adoption in agriculture, health, education can improve service delivery in rural and underserved regions.

Challenges:

- **Talent Gaps:** Limited high-end AI researchers and applied AI professionals.
- **Fragmented Data Ecosystem:** Need for standardised, privacy-compliant, sectoral data-sharing frameworks.
- **Compute Infrastructure:** GPU shortages, lack of edge-cloud networks could slow deployment.
- **Regulatory Uncertainty:** Patent norms for AI-discovered drugs, cybersecurity compliance for AI models need clarity.
- **Adoption Divide:** MSMEs and small financial institutions may struggle to afford AI solutions, widening inequality in adoption.

Way Ahead:

- **National AI Mission Execution:** Fast-track implementation of IndiaAI Mission with periodic monitoring.
- **AI-Ready Infrastructure:** Invest in **AI-ready industrial parks**, federated compute networks, and data exchanges.
- **Skilling at Scale:** Launch AI micro-credentials, lifelong learning pathways, and reverse diaspora programs for top talent.
- **Robust AI Governance:** Build frameworks for **ethical AI**, explainability, risk audits, and consumer protection.
- **Public-Private Partnerships:** Incentivise startups, industry, and academia to co-develop solutions and scale innovation.

Conclusion:

The **AI for Viksit Bharat Roadmap** is a bold step to make India a **global AI powerhouse**. If executed well, it can close the growth gap, generate millions of new-age jobs, and place India at the forefront of **responsible, inclusive, innovation-driven growth**. Timely execution, governance, and skilling will decide whether India leads or lags in the global AI revolution.

THE RTI'S SHIFT TO A 'RIGHT TO DENY INFORMATION'

Context:

The DPDP Act, 2023 amended Section 8(1)(j) of the RTI Act, shrinking it to a few words, allowing broad denial of information as "personal".

- Experts fear this could weaken transparency, turning RTI into a "Right to Deny Information" and shielding corruption.

About The RTI's Shift to A 'Right to Deny Information':

Right to Information (RTI) Act – Overview

- **Enacted in 2005**, RTI empowers citizens to demand information from public authorities, enforcing **Article 19(1)(a)**.
- It enables **social audits, accountability, and participatory governance**, strengthening democracy.
- **Section 8(1)(j):**
  - Earlier allowed denial only if data had **no public interest relevance** or caused **unwarranted privacy violation**.
  - **Proviso:** If info cannot be denied to Parliament/Legislature, it cannot be denied to any citizen — ensuring parity.

DPDP Act and RTI:

- The **Digital Personal Data Protection Act, 2023** seeks to regulate data privacy but overrides RTI safeguards.
- The amendment reduces Section 8(1)(j) to a vague clause, widening the scope to deny even harmless information.
- The DPDP's definition of "person" includes **individuals, firms, companies, HUFs, associations, and the State**, making nearly all information fall under "personal data".
- With **₹250 crore penalties** for data breach, PIOs may prefer blanket denial to avoid risk — eroding the right to know.

Concerns:

- **Transparency Undermined:** Most requests — like pension lists, recruitment data — may be rejected citing privacy.
- **Public Interest Test Ignored:** Constitutional mandate of maximum disclosure is sidelined, making citizens prove "larger public interest".
- **Chilling Effect on PIOs:** Fear of penalties pushes officers to reject requests rather than face legal consequences.
- **Corruption Shield:** Ghost employees, fake beneficiaries, and procurement scams may go undetected, enabling misuse of funds.
- **Democratic Regression:** Weakens the **citizen's role as watchdog**, diluting accountability mechanisms essential for democracy.

Challenges Associated:

- **Legal Ambiguity:** Conflict between privacy (Puttaswamy judgment) and transparency lacks clear balancing framework.
- **Institutional Weakness:** CIC and State Commissions suffer 30–40% vacancies, causing long pendency of appeals.
- **Digital Divide:** Rural poor may find it harder to pursue online RTI appeals, reducing inclusiveness.
- **Citizen Apathy:** Limited civil society mobilisation compared to 2005 RTI movement; weaker public pressure.
- **Political Reluctance:** Governments benefit from opacity and are unlikely to proactively restore strong RTI provisions.

Way Forward:

- **Reinstate Proviso:** Ensure citizens get same access to information as Parliamentarians to protect parity and accountability.
- **Narrow Definition:** Limit "personal information" to sensitive data only (health, family details) using proportionality principle.
- **Strengthen Institutions:** Fill vacancies in CIC/State Commissions, improve funding, set time-bound disposal norms.
- **Proactive Disclosure:** Government must publish key datasets online (beneficiary lists, tenders) reducing need for RTIs.
- **Balance Privacy & Transparency:** Apply Supreme Court's proportionality test (Puttaswamy Case) to harmonise both rights.

Conclusion:

RTI is India's most powerful anti-corruption law, empowering citizens to hold the state accountable. Weakening it through vague privacy clauses risks reversing transparency gains of two decades. Legislators, courts, and civil society must work to restore RTI's spirit as a tool of participatory democracy.

Topics: India and its neighbourhood- relations.

NEPAL'S POLITICAL TURMOIL: A TEST CASE FOR INDIA'S NEIGHBOURHOOD FIRST POLICY

Context:

Nepal is witnessing a political churn after the resignation of PM K.P. Sharma Oli, violent protests, and the swearing-in of former Chief Justice Sushila Karki as interim PM.

- India faces a strategic challenge to protect its security and economic interests while avoiding perceptions of interference, even as China deepens its influence.

About Nepal's Political Turmoil: A Test Case for India's Neighbourhood First Policy

India–Nepal Relations:

- **Geostrategic Neighbour:** India shares a **1,770–2,000 km open border** with Nepal, allowing free movement of goods and people, making political instability a direct security concern.
- **Cultural & Civilisational Ties:** Shared Hindu-Buddhist heritage, deep people-to-people contact (Madhesi population), and Gorkha regiments in the Indian Army make the relationship unique.
- **Economic Interdependence:** India is Nepal's largest trade partner and investor (accounts for **over 60% of Nepal's trade**), major source of FDI, fuel, medicines, and electricity.
- **Hydropower Diplomacy:** India imports power from Nepal under cross-border power trade agreements and invests in projects like **Upper Karnali & Arun-III hydropower plants**.
- **Security Stakes:** Any political vacuum could allow cross-border smuggling, fake currency networks, and Chinese strategic presence under the Belt and Road Initiative (BRI).

China's Growing Footprint in Nepal:

- **BRI Investments:** China funds infrastructure projects — highways, airports, and rail links (Tibet–Kathmandu Railway).
- **Political Leverage:** Beijing has cultivated ties across Nepal's parties, mediating even intra-party disputes in CPN.
- **Soft Power Expansion:** Chinese language, Confucius Institutes, scholarships, and media engagement boost influence.
- **Security Risks:** Chinese presence near Siliguri Corridor (Chicken's Neck) is a concern for India's strategic calculus.

Concerns for India:

- **Political Instability:** 14 governments in 17 years; frequent coalition collapses disrupt bilateral agreements.
- **Anti-India Sentiment:** Legacy of blockades (2015), perception of interference fuels mistrust among Nepali youth.
- **China Factor:** Strategic depth gained by Beijing could challenge India's primacy in Himalayan geopolitics.
- **Border Management:** Open border facilitates illegal migration, arms smuggling, and potential terror routes.
- **Economic Fallout:** Political crisis may derail India-funded connectivity projects (rail, ICPs, energy corridors).

Challenges for India:

- **Balancing Non-Interference & Engagement:** Over-engagement risks accusations of "big brother" behaviour; under-engagement leaves space for China.
- **Youth Disconnect:** Gen Z Nepalese grew up post-monarchy, often shaped by anti-India narratives, making trust-building tougher.
- **Federal Politics:** Need to engage not just Kathmandu but provinces, Madhes leaders, and new political actors.
- **Economic Vulnerabilities:** Political turmoil may affect remittance inflows, border trade, and cross-border power projects.
- **Security & Refugee Risks:** Prolonged instability could increase refugee influx and boost Chinese intelligence activity.

Way Forward:

- **Diplomatic Engagement:** Deepen ties with emerging leaders across provinces; strengthen Track 1.5 & Track 2 dialogues.
- **Economic Diplomacy:** Fast-track border infrastructure, ICPs, and rail connectivity (Jaynagar–Bardibas, Raxaul–Kathmandu).
- **Energy Cooperation:** Scale up hydropower projects and facilitate trilateral power trade (India–Nepal–Bangladesh).
- **People-to-People Initiatives:** Expand scholarships, tourism circuits (Ramayana Circuit), and cultural

exchanges to counter anti-India narratives.

- **Strategic Patience:** Avoid overt political alignment; focus on institution-building and long-term partnership rather than personalities.

Conclusion:

India must adopt a **calibrated, multi-dimensional approach** that secures its strategic interests without fuelling anti-India sentiment. Economic interdependence, energy partnerships, and youth-centric diplomacy will be key to building trust. A stable, democratic, and prosperous Nepal is the best guarantor of India's security and regional balance vis-à-vis China.

INDIA–MAURITIUS SPECIAL ECONOMIC PACKAGE

Context:

Mauritius PM Navinchandra Ramgoolam visited Varanasi, where India announced a USD 680 million Special Economic Package covering health, infrastructure, maritime security, and education.

About India–Mauritius Special Economic Package:

Key Components of the Partnership

- **Development & Economic Cooperation:**
  - **USD 680 Million Package:** Includes **grants and line of credit** for health, infrastructure, and maritime projects.
  - **Healthcare Support:** Construction of **New Sir Seewoosagur Ramgoolam National Hospital**, first **Jan Aushadhi Kendra** outside India, AYUSH Centre of Excellence.
  - **Education & Research:** MoUs between **IIT-Madras, IIPM-Bengaluru & University of Mauritius** to promote innovation and skilling.
  - **Infrastructure:** Development of **Motorway M4**, **Ring Road Phase II**, new **ATC tower** at SSR Airport, port equipment acquisition.
- **Maritime & Strategic Cooperation:**
  - **Port Development:** Joint redevelopment of Port Louis to strengthen Mauritius as a **regional maritime hub**.
  - **Blue Economy & Surveillance:** Cooperation on monitoring **Chagos Marine Protected Area** and hydrographic mapping of EEZ.
  - **Defence Support:** Provision of helicopters, capacity-building, and joint security initiatives.
- **Cultural & Civilisational Ties:**
  - Over **68% of Mauritian population is of Indian origin**, binding the nations through shared heritage.
  - Symbolic gestures like hosting PM Ramgoolam in Varanasi and Ganga Aarti participation reaffirm **spiritual connect**.

Strategic Significance:

- **Geopolitical Importance:**
  - Mauritius lies near critical **sea lanes of communication (SLOCs)** in the Indian Ocean, making it vital for India's **maritime domain awareness** and countering Chinese influence.
  - Acts as a **gateway to Africa** and a trusted partner in forums like **IORA, Commonwealth, and Indian Ocean Commission.**
- **Economic Gateway:**
  - Mauritius is a major **investment route** for FDI inflows to India due to bilateral taxation treaties.
  - Port modernisation will boost India's Sagarmala Project and regional trade connectivity.
- **Soft Power & Diaspora Diplomacy:**
  - Large Indian diaspora strengthens goodwill and ensures Mauritius remains India's closest ally in the Indian Ocean.
  - **AYUSH cooperation** and **Mission Karmayogi training modules** expand India's soft power footprint.

Challenges:

- **Geopolitical Competition:** China's Belt and Road Initiative investments in the Indian Ocean (e.g., Hambantota) challenge India's strategic outreach.
- **Climate Vulnerability:** Mauritius is prone to cyclones, sea-level rise, and coastal erosion, risking newly built infrastructure.
- **Economic Fragility:** Mauritius' economy is tourism- and finance-heavy, vulnerable to global slowdowns and external shocks.
- **Execution Delays:** Past India-funded projects in island nations have faced slow implementation due to logistics and bureaucratic bottlenecks.
- **Maritime Security Threats:** Piracy, illegal fishing, and potential misuse of EEZ by hostile actors require constant vigilance and joint monitoring.

Way Forward:

- **Strengthen Maritime Partnership:** Expand joint EEZ surveillance, hydrographic mapping, and training for

Mauritius Coast Guard under SAGAR.

- **Build Climate-Resilient Infrastructure:** Adopt cyclone-proof designs, renewable energy integration, and mangrove restoration for sustainability.
- **Accelerate Project Delivery:** Use digital monitoring dashboards, single-window clearances, and private sector participation to avoid delays.
- **Economic Diversification:** Collaborate in fintech, digital public infrastructure (UPI, RuPay), and green hydrogen to broaden economic base.
- **Cultural & People Diplomacy:** Expand scholarships, cultural exchanges, and tourism circuits (Varanasi–Mauritius connects) to deepen people-to-people ties.

Conclusion:

India–Mauritius relations are evolving from a traditional partnership to a comprehensive, future-ready strategic alliance. With health, education, infrastructure, and maritime cooperation forming the core, this partnership embodies the Neighbourhood First policy in action.

INDIA–CHINA RELATIONS AND THE PANCHSHEEL DOCTRINE

Context:

At the **SCO Summit 2025 in Tianjin**, Prime Minister Narendra Modi and Chinese President Xi Jinping held bilateral talks stressing peace on the border and expanding cooperation.

About India–China Relations and the Panchsheel Doctrine:

Background

- Panchsheel (Five Principles of Peaceful Coexistence) was articulated in the **1954 Agreement on Trade and Intercourse with Tibet** between India and China.
- **Principles:**
  1. Mutual respect for sovereignty and territorial integrity.
  2. Mutual non-aggression.
  3. Mutual non-interference in internal affairs.
  4. Equality and mutual benefit.
  5. Peaceful coexistence.
- Championed by **Jawaharlal Nehru** and **Zhou Enlai**, later integrated into Bandung (1955), UNGA resolution (1957), and NAM (1961).

Current Context:

- **Post-Galwan tensions (2020):** Relations strained over LAC disputes, disengagement only partially achieved.
- **Recent engagement:** Both sides stress "development partners, not rivals."
- **Xi's 4-point plan:** Deeper trust, strategic communication, expanded cooperation, and safeguarding common interests.
- **India's position:** Border peace is a precondition for stable ties; relations should not be viewed through a third-country (US) lens.

Strategic Importance of Panchsheel:

- **For India**
  - Panchsheel offers India a **moral and diplomatic framework** rooted in non-alignment and independent decision-making in foreign policy.
  - It strengthens India's **sovereignty and equality**, ensuring no compromise when dealing with larger powers like China.
  - By following Panchsheel, India maintains **strategic autonomy**, avoiding alignment with either US or Chinese blocs.
  - It helps India project itself as a **responsible power** committed to peaceful coexistence in its neighbourhood.
- **For China**
  - Panchsheel allows China to **project a benign image** globally, countering criticism of its assertive behaviour in Asia.
  - It frames ties with India as **cooperation and mutual respect,** not rivalry or confrontation.
  - The doctrine provides China with a **diplomatic shield** to justify its policies under the language of peace and equality.
  - It helps Beijing **soften its rise narrative**, presenting itself as a partner in regional stability.

Global Relevance

- Panchsheel resonates with the idea of **multipolarity**, promoting balance against domination by a single superpower.
- It reflects **South–South solidarity**, aligning with aspirations of developing nations for fairer global governance.
- The doctrine provides an **alternative to bloc politics**, encouraging coexistence rather than Cold War–style rivalries.

Challenges in Implementation:

- **Border clashes:** Incidents like Doklam (2017) and Galwan (2020) erode mutual trust and show that

agreements on peace are fragile.

- **Trade asymmetry:** Bilateral trade is heavily tilted in China's favour, leaving India with a ~$100 billion deficit that fuels economic dependence.
- **Sovereignty concerns:** Projects like BRI and CPEC through PoK, along with Chinese naval presence, directly challenge India's territorial integrity.
- **Geopolitical balancing:** India's growing alignment with QUAD and the US is perceived by China as a containment strategy, deepening suspicion.

Opportunities:

- **Economic cooperation:** Both sides can collaborate in technology, renewable energy, and pharmaceuticals to diversify and strengthen their economies.
- **Multilateral platforms:** Through SCO, BRICS, and G20, India and China can jointly counterbalance Western dominance in global governance.
- **Global reforms:** Shared interests exist in pushing WTO reforms, stronger climate action, and UNSC restructuring to reflect emerging powers.
- **Cultural links:** Common heritage through Buddhism, pilgrimages, and tourism creates a soft power bridge to improve people-to-people ties.

Way Forward

- **Reaffirm Panchsheel:** Using its principles as a guiding framework, both nations can establish stronger mechanisms for border dispute resolution.
- **Confidence-building:** Hotlines, joint patrols, and local-level agreements can reduce chances of conflict and maintain peace along the LAC.
- **Issue-based cooperation:** Climate change, counter-terrorism, and fair trade provide neutral areas where both can work together constructively.
- **Regional forums:** Engagement through SCO, BRICS, and Indo-Pacific platforms can stabilise relations while managing global rivalries.
- **Economic strategy:** India must reduce import dependence on China while exploring complementarities to make trade more balanced.

Conclusion:

The Panchsheel doctrine, though tested over decades, still shapes India–China engagement as its revival in 2025 shows that border tensions must not overshadow peaceful coexistence and stability, and for India the task is to balance national interests with Panchsheel's spirit while learning from history.

Topics: Bilateral, regional and global groupings and agreements involving India and/or affecting India's interests.

SOUTH-SOUTH AND TRIANGULAR COOPERATION

Context:

On September 12, 2025 (UN Day for SSTC), calls were made to reform and strengthen South-South and Triangular Cooperation as a tool for achieving the 2030 Sustainable Development Agenda.

About South-South and Triangular Cooperation (SSTC):

What it is?

- **South-South Cooperation (SSC)**: Collaboration among developing countries to share knowledge, skills, technology, and resources for mutual growth.
- **Triangular Cooperation (TrC)**: Partnerships between developing countries supported by developed nations or multilateral agencies.
- Recognised as a complement, not substitute, to North-South cooperation.

Origin:

- Formalised under the **Buenos Aires Plan of Action (BAPA), 1978**.
- UN adopted **Sept 12** as **International Day for SSTC**, marking BAPA's anniversary.

Aim:

- Foster self-reliance and collective resilience among developing nations.
- Strengthen capacity to design solutions tailored to local contexts.
- Promote mutual benefit, solidarity, and equality in development cooperation.

Functions:

- **Capacity-building, knowledge-sharing, and technology transfer:** Helps developing nations build skills, share best practices, and access affordable

technology to solve local development challenges.

- **Voice in global governance:** Strengthens the collective bargaining power of the Global South in shaping international policies and multilateral institutions.
- **Regional and interregional cooperation:** Encourages countries to pool resources and collaborate across regions to tackle common issues like climate change, health crises, and trade barriers.
- **Complement to aid:** Provides an alternative to traditional aid by offering mutual support without conditionalities, enhancing resilience and self-reliance.

Significance:

- **Development Impact:** Promotes low-cost, innovative, and scalable models directly aligned with Sustainable Development Goals (SDGs).
- **Global South Solidarity:** Encourages collective ownership, reducing dependence on developed nations while empowering Southern nations to shape solutions.
- **Resilience:** Provides practical solutions in food security, disaster preparedness, climate adaptation, and public health systems.
- **Equity:** Counters unequal conditionalities of traditional aid by ensuring fairness, sovereignty, and respect for domestic priorities.

India's Role in SSTC:

- **Philosophy:** Guided by *Vasudhaiva Kutumbakam*, India projects solidarity and inclusiveness in global cooperation.
- **ITEC programme:** Trains professionals from 160+ countries, boosting skills in governance, IT, agriculture, and health.
- **India-UN Development Partnership Fund (2017):** Financed 75+ projects across 56 developing nations, especially LDCs and small island states.
- **Digital diplomacy:** Exported innovations like Aadhaar, UPI, and digital platforms, offering scalable governance solutions abroad.
- **Voice of Global South Summits & AU in G20:** Amplified South's concerns globally while championing Africa's integration into decision-making forums.
- **India-WFP partnership:** Innovations like Grain ATMs, fortified rice, and ration optimisation showcase India as a model for other developing nations.

Challenges to SSTC:

- **Funding constraints:** Shrinking humanitarian and development budgets limit scalability of projects.
- **Capacity gaps:** Many developing nations lack infrastructure, institutions, or skilled manpower to absorb innovations effectively.
- **Consensus issues:** Absence of a common global framework hampers monitoring, evaluation, and accountability.
- **Geopolitical pressures:** North-South power imbalances and aid politicisation undermine SSTC's neutrality.
- **Execution barriers:** Difficulty in adapting local success stories into diverse regional contexts limits replication.

Way Ahead:

- **Expand scope:** Bring new areas like digital economy, AI regulation, and climate financing under SSTC.
- **Strengthen institutions:** Establish dedicated SSTC platforms and secretariats for knowledge exchange and project coordination.
- **Innovative financing:** Mobilise funds via private sector, diaspora bonds, and pooled Southern resources to overcome budget gaps.
- **Triangular leverage:** Involve developed nations and multilateral bodies for expertise while keeping Southern nations in the lead.
- **Monitoring & accountability:** Develop transparent, SDG-linked reporting mechanisms for better tracking of projects and outcomes.

Conclusion:

South-South and Triangular Cooperation is no longer just a diplomatic slogan, but a development lifeline for billions. India's leadership gives it a unique opportunity to shape equitable global partnerships. With stronger institutions and innovation, SSTC can become a true pillar of the 2030 Agenda.

SAUDI ARABIA-PAKISTAN DEFENCE PACT

Context:

Saudi Arabia and Pakistan signed a Strategic Mutual Defence Agreement (SMDA) in Riyadh (Sept 2025), pledging that any aggression against one country would be treated as aggression against both — formalising a long-standing security partnership.

About Saudi Arabia–Pakistan Defence Pact:

- **What It Is?**
  - A *Strategic Mutual Defence Agreement (SMDA)* committing both nations to mutual security cooperation and joint deterrence.
- **Key Features:**
  - **Mutual Defence Clause:** Attack on either nation = attack on both.
  - **Scope:** Covers all military means — including conventional, advisory, and potentially nuclear deterrence.
  - **Institutionalisation:** Builds on 1982 Bilateral Security Cooperation Agreement & decades of military training, arms trade, and troop deployments.
  - **Strategic Context:** Signed post-Israel–Qatar tensions; signals Riyadh's shift to regional self-reliance amid doubts on U.S. security guarantees.
  - **Economic Angle:** Secures Saudi financial support for Pakistan's struggling economy, enabling arms procurement and energy supplies.

Implications

For India:

- **Strategic Watchfulness:** Pact theoretically allows Pakistan to seek diplomatic or material backing in a future India–Pakistan conflict.
- **Limited Immediate Threat:** Saudi–India relations have deepened (USD 42.9 bn trade, defence cooperation, investments) — Riyadh unlikely to tilt overtly anti-India.
- **Opportunity for Diplomacy:** New Delhi must maintain Saudi engagement to ensure continued Arab neutrality in South Asian crises.

Global Level:

- **Regional Security Realignment:** Strengthens Saudi deterrence against Iran, Yemen's Houthis, and Israel's unilateral actions.
- **U.S. Angle:** Reflects declining faith in American security umbrella; increases multipolarity in Gulf security architecture.
- **Nuclear Sensitivity:** Raises questions about potential nuclear sharing, though actual transfer of Pakistani nukes to Saudi is highly improbable given Israeli red lines.
- **Geopolitical Signalling:** Symbolic show of Islamic solidarity; Pakistan positions itself as pan-Islamic security provider.

Way Ahead for India

- **Strengthen Strategic Engagement:** Deepen defence cooperation through training offers, joint exercises, and intelligence-sharing.
- **Energy Diplomacy:** Secure long-term crude & green hydrogen deals to reinforce mutual interdependence.
- **Track Security Shifts:** Monitor SMDA implementation and its practical footprint, including Pakistani troop deployments.
- **Boost Arabian Sea Synergy:** Enhance naval presence & maritime security cooperation to safeguard India's energy lifelines.
- **Leverage Economic Heft:** Use India's market size & diaspora links as a stabilising factor in Indo-Saudi ties.

Conclusion:

The Saudi–Pakistan SMDA is a **symbolic reaffirmation** of their historic security partnership rather than a direct threat to India. For New Delhi, the priority must be **strategic vigilance, deeper engagement with Riyadh, and leveraging economic and energy interdependence** to maintain Arab neutrality in South Asian conflicts.

INDIA'S STRATEGIC AUTONOMY IN A MULTIPOLAR WORLD

Context:

India's pursuit of strategic autonomy has gained prominence in the context of a multipolar world order marked by U.S.–China rivalry and Russia's assertiveness.

About India's Strategic Autonomy in a Multipolar World:

- **Definition**:
  - Strategic autonomy means freedom to make sovereign choices in foreign policy and defence without being tied down by alliance obligations. It prioritises flexibility and independence.
- **Historical Roots of Strategic Autonomy**
  - **Colonial Experience:** Centuries of colonial subjugation instilled a resolve in free India to never let external powers dictate its sovereignty or global role.
  - **Constitutional Ethos:** India's foreign policy emerged from its freedom struggle ideals, emphasising sovereignty, self-reliance, and dignity in international affairs.

- **Non-Aligned Movement (NAM):** Nehru formalised autonomy through NAM during the Cold War, balancing U.S. and Soviet pressures without bloc allegiance.
- **Evolution into Multi-Alignment:** Post-1991 globalisation and multipolarity pushed India towards engaging all powers pragmatically while preserving independence.

Drivers of Strategic Autonomy:

- **Geopolitical Setting**: Sharing borders with China and Pakistan—both nuclear rivals—forces India to keep independent options open for security.
- **Security Needs**: India's reliance on imported defence equipment and energy makes diversification essential to prevent overdependence.
- **Civilisational Aspiration**: India seeks recognition as a rising pole of power, rooted in its civilisational identity, rather than a client state.
- **Global Order Shift**: Decline of U.S. unipolarity, rise of China, and fragmentation of alliances create more manoeuvring space for India.
- **New Threats**: Cyber warfare, pandemics, climate change, and AI-based conflicts require broad cooperation across blocs, not rigid alignment.

Opportunities for Strategic Autonomy:

- **Bridge-Builder**: India can act as a mediator between Global South and developed countries, amplifying its diplomatic influence.
- **Technology Diplomacy**: Partnerships in AI, quantum computing, and clean energy allow India to reduce dependence and build resilience.
- **Defence Indigenisation**: Atmanirbhar Bharat offers scope to modernise defence with indigenous production, reducing foreign dependence.
- **Soft Power**: India's plural democracy, diaspora, and civilisational values enhance its credibility in global forums.
- **Global South Voice**: G20 presidency and leadership in forums like BRICS project India as a legitimate representative of emerging economies.

Challenges to Strategic Autonomy:

- **Economic Vulnerability**: Heavy import dependence for oil, defence, and technology weakens India's bargaining capacity.
- **China Factor**: Border clashes and an unsustainable trade deficit of $100B+ compromise India's room for manoeuvre.
- **Alliance Pressures**: Balancing U.S.-led QUAD and Russia/China-led BRICS-SCO creates conflicting demands.
- **Institutional Gaps**: Domestic political polarisation, bureaucracy limits, and capacity gaps affect consistent foreign policy execution.
- **New Domains**: India still lags in cyber resilience, semiconductor supply chains, and space technology, which constrains autonomy.

Way Forward:

- **Economic Strengthening**: India must build resilient supply chains, ensure energy security, and scale up manufacturing to reduce vulnerabilities.
- **Balanced Engagement**: Deepen ties with the U.S. and Indo-Pacific while retaining historical links with Russia and engaging Global South.
- **Defence Indigenisation**: Prioritise investments in AI, drones, space, and cyber systems to reduce import reliance.
- **Voice of Global South**: Push for reforms in UN, WTO, IMF and lead climate and development issues to shape the global agenda.
- **Adaptive Diplomacy**: Blend principle with pragmatism, staying agile to respond to fast-changing geopolitics without losing sovereignty.

Conclusion:

India's strategic autonomy is about **resilience, not isolation**, and about engaging without being dominated. It ensures India can balance major powers while safeguarding sovereignty and growth. Strengthening economic, technological, and defence capacities will enable India to rise as a **sovereign pole in a multipolar world**.

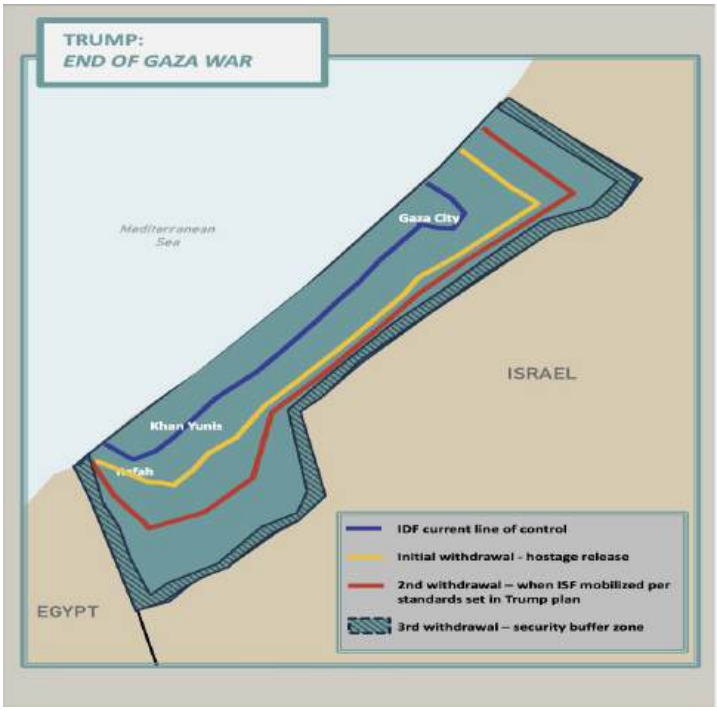
Topics: Effect of policies and politics of developed and developing countries on India's interests, Indian diaspora.

TRUMP'S GAZA PEACE PLAN

Context:

Prime Minister of India welcomed Donald Trump's **20-point Gaza peace proposal**, calling it a pathway to long-term peace in West Asia.

- The plan seeks an immediate ceasefire, hostage release, and Gaza reconstruction, backed by Arab and Western leaders.



About Trump's Gaza Peace Plan:

What it is

- It is a **diplomatic framework** designed to end the 2023–25 Israel–Hamas war through ceasefire, disarmament, and reconstruction.
- It envisions Gaza as a **"New Gaza"** **special economic zone**, monitored internationally until Palestinian governance reforms occur.

Key Features:

1. **Immediate Ceasefire:** Israel to halt military operations once Hamas agrees; battle lines will freeze for stability.
2. **Hostage–Prisoner Swap:** Hamas to release all hostages (alive and dead) within 72 hours; Israel to release 2,000+ Palestinian detainees.
3. **No Forced Displacement:** Palestinians will not be expelled from Gaza, ensuring protection of demographic and human rights.
4. **No Role for Hamas:** Hamas excluded from future governance; members disarming will get amnesty or safe passage abroad.
5. **Board of Peace:** An international body led by Trump and Tony Blair to oversee Gaza's governance and reconstruction.
6. **International Stabilisation Force:** A multinational force, with Arab states, to maintain peace and train Palestinian police.
7. **Economic Zone:** Gaza to be developed as a **special economic hub** with preferential trade and aid-driven reconstruction.
8. **Conditional Palestinian Statehood:** Offers a "political horizon" for Palestinian statehood once Palestinian Authority (PA) reforms and security guarantees are ensured.

Positives

- **Ceasefire mechanism:** Provides immediate relief from war, halting civilian casualties and destruction.
- **Hostage resolution:** Builds confidence by addressing one of the most sensitive humanitarian issues first.
- **Regional support:** Arab states, EU, and India backing the plan give it **multilateral legitimacy**.
- **Reconstruction plan:** Prioritises rebuilding of homes, infrastructure, and economy in war-ravaged Gaza.
- **Global oversight:** International monitors reduce mistrust and enhance accountability between Israel and Palestine.

Challenges:

- **Hamas' acceptance:** Radical factions may refuse disarmament or reject exclusion from power.
- **Israeli scepticism:** Israel fears security loopholes and doubts Palestinian Authority's ability to govern effectively.
- **Implementation hurdles:** Managing prisoner swaps, aid distribution, and ceasefire compliance is complex.
- **Political fragility:** Deep divisions between Hamas and Palestinian Authority could stall any governance arrangement.
- **Statehood ambiguity:** The plan avoids a clear timeline for Palestinian sovereignty, risking long-term discontent.

Way Ahead:

- **Consensus-building:** U.S., UN, and Arab nations must collectively pressure both sides to honour commitments.
- **Stronger oversight:** UN agencies and Arab monitors should guarantee transparent aid delivery and ceasefire compliance.
- **Inclusive Palestinian reforms:** Strengthening the Palestinian Authority and involving civil society will ensure legitimacy in governance.
- **Two-state linkage:** Gaza's redevelopment must be tied to progress towards a **viable two-state solution** for durable peace.

Conclusion:

The Gaza peace plan is a **rare diplomatic opening** but fragile without Hamas' compliance and Israel's security reassurances. For durable peace, it must evolve into a **just pathway for Palestinian statehood**. A balance of humanitarian relief, reconstruction, and political reform is the only sustainable way forward in West Asia.

GENERAL STUDIES – 3

Topics: Indian Economy and issues relating to planning, mobilization of resources, growth, development and employment.

REIMAGINING GREEN ECONOMY THROUGH LANDSCAPES

Context:

India's bioeconomy has grown 16 times in the last decade (2014–2024), reaching $165.7 billion and accounting for 4.25% of GDP, but challenges of rural–urban disparity highlight the need for a landscape-driven green economy model.

About Reimagining Green Economy through Landscapes:

Green Economy:

- A green economy is an economic model that fosters **sustainable development** while reducing environmental risks and ecological scarcities.

Features of Green Economy:

- **Low carbon:** Promotes renewable energy, e-mobility, and energy efficiency to reduce emissions.
- **Resource efficiency:** Encourages recycling, waste-to-energy, circular economy, and sustainable agriculture.
- **Inclusive growth:** Integrates women, rural communities, and MSMEs into green value chains.
- **Ecosystem restoration:** Protects biodiversity, soil health, water resources, and forests.
- **Technology-driven:** Uses AI, IoT, and digital platforms for monitoring, smart grids, and carbon markets.

Importance of Green Economy:

- **Climate resilience:** Reduces India's vulnerability to extreme weather events and ensures food–water security.
- **Employment generation:** Expected to create 35 million green jobs by 2030, fostering inclusive livelihoods.
- **Energy security:** Lowers dependence on fossil fuels, promoting self-reliance under Aatmanirbhar Bharat.
- **Global competitiveness:** Helps India counter carbon border taxes and expand in sustainable export markets.
- **Social equity:** Bridges rural–urban divide by enabling clean energy access, sustainable farming, and women's participation.

Constitutional and Policy:

- **Article 21 & 48A:** Right to life and State's duty to protect environment.
- **Panchayats (Article 243G):** Empowered for local planning including natural resource management.
- **Policies & Missions:** National Bio-Energy Mission, BioE3 Policy (2024), National Action Plan on Climate Change, Bharat 6G Vision, and MGNREGA's green infrastructure initiatives.

Emerging Trends in India's Green Economy:

- **Rapid Bioeconomy Growth:** Contribution of **4.25% to GDP**, with biofuels, bioplastics, and pharmaceuticals leading.
- **Ethanol & Renewables Push:** Achieved **20% ethanol blending**, 250% growth in renewable energy capacity (2015–2021).
- **Job Potential:** 35 million green jobs by 2030; however, **gender gap** persists, with women holding only 11% of rooftop solar jobs.
- **Rural-Urban Divide:** Urban centres attract EVs, green infrastructure, and green jobs; rural areas face slower, inequitable adoption.
- **Regional Disparities:** Maharashtra, Karnataka, Gujarat, and Telangana dominate, while eastern and tribal-rich states remain underrepresented.

Challenges and Trade-offs:

- **Disparities in Access:**
  - Urban areas receive bulk of green investments; rural areas lag in irrigation efficiency, renewable adoption, and clean tech.
  - *Eg:* North-eastern states contribute <6% to bioeconomy despite resource richness.
- **Energy Transition Dilemmas:**
  - Simultaneous push for **renewables** and **fossil fuel subsidies (up to 40%)** undermines net gains.
  - Solar pumps risk incentivising **over-extraction of groundwater**.
- **Industrial Pressure:**
  - Hard-to-abate sectors (steel, cement, power) contribute **23% of GHG emissions**; green tech costs remain >4x traditional options.
- **Socio-economic Risks:**
  - Rapid transition risks job loss for **coal workers, MSMEs, small manufacturers**.
  - Agriculture-dependent households (58%

of rural livelihoods) remain vulnerable to climate variability.

- **Gender and Social Gaps:**
  - Women's participation in green jobs remains **1–3% in technical roles**.
  - Tribal and marginal communities remain "beneficiaries" rather than **climate leaders**.
- **Policy Fragmentation:**
  - Despite BioE3 and renewable missions, **lack of integration** across ministries and weak enforcement reduces effectiveness.

Landscape Approach: A Way Forward

- **Integrated Planning:**
  - View landscapes as **systems of land, water, biodiversity, energy, and local markets**.
  - Adopt participatory assessments from **village to macro-level** for ecosystem valuation.
- **Institutional Anchoring:**
  - Leverage **2.5 lakh PRIs and 12 million women-led SHGs** for design, monitoring, and ownership of green transitions.
- **Circular & Local Economies:**
  - Promote **tribal-led bioeconomy models** (non-timber forest produce, agri-waste reuse).
- **Gender Mainstreaming:**
  - Targeted training, leadership roles, and incentives for women in **solar, biofuels, and waste-to-energy sectors**.
- **Green Infrastructure and Innovation:**
  - **Green budgeting, fiscal incentives, public procurement of sustainable products**.
  - Expand **100+ 5G/6G labs** for greening digital infrastructure.
- **Waste and Resource Management:**
  - Urban areas generate 75% of solid waste; rural areas face unsegregated bio + plastic waste.
  - Need for **SOPs, decentralised financing, and circular waste economy**.

Conclusion:

India's green transition must move beyond urban-industrial focus towards a **landscape-driven, community-based model**. Integrating local resources, women's leadership, and tribal bioeconomy with technology can build resilience. By 2047, India must aim for **ecological regeneration, equity, and global climate leadership**, not just GDP growth.

THE WEAKENING RUPEE: CAUSES, IMPLICATIONS AND POLICY PATHWAYS

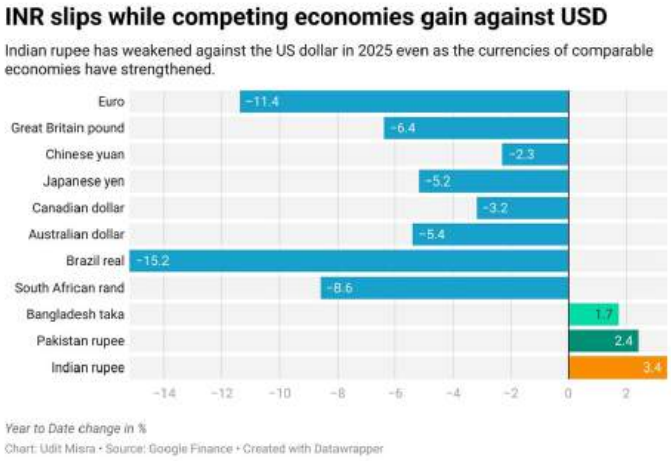
Context:

The Indian Rupee's recent weakness against the dollar stems from a persistent trade imbalance and sluggish investment inflows, compounded by global financial tightening.

About The Weakening Rupee: Causes, Implications and Policy Pathways

Trends in Rupee's Slide:

- **Against the Dollar:** Since January 2025, INR has lost over **3% value vs USD**, sharper than many emerging economies.
- **Against Other Majors:** INR weakened against **euro and pound**, showing broader depreciation.
- **Regional Comparison:** Currency fall parallels Bangladesh and Pakistan, but India's slide has been steeper.
- **Short-term losses:** Over **1.3% depreciation within one month**, highlighting volatility.



Causes Behind Rupee Weakness:

- **Trade Imbalance:** Exports are stagnant due to global protectionism, but high imports (oil, electronics) persist, worsening the Current Account Deficit (CAD).

  Eg: India imports ~85% of dollar-priced crude, magnifying the CAD strain.
- **Investment Slowdown:** Global uncertainty and weak corporate earnings have caused FPI and FDI inflows to become sluggish or negative.

  Eg: Net FPI outflows of $1.5 bn recorded recently reduce the dollar supply.
- **Relative Demand for Currency:** Global demand for the dollar is low compared to the dollar, as the exchange rate depends on comparative currency appetite.

- **Growth Concerns:** Subdued GDP growth (~6.1% in Q1 FY26) shakes investor confidence, discouraging capital retention.
- **Global Financial Tightening:** Strong returns in US assets (bonds, equities) are pulling capital away from India.

Impacts of Rupee Depreciation:

- **Negative Impacts:**
  - **Import Inflation:** Costlier essential imports (crude oil, fertilizers, electronics) increase domestic inflationary pressures.
  - **Corporate Stress:** Firms with unhedged external commercial borrowings face higher rupee repayment costs on their dollar debt.
  - **CAD Pressure:** A weaker rupee expands the Current Account Deficit by making dollar-denominated imports more expensive.
  - **Consumer Burden:** Expenses for foreign services like education, tourism, and medical care become substantially costlier.
- **Positive Impacts:**
  - **Boost to Exports:** Depreciation makes Indian goods cheaper in global markets, improving price competitiveness.
  - **Tourism & Remittances:** NRIs benefit as their dollar remittances yield higher rupee conversions, boosting money inflow.
  - **Domestic Substitution:** Rising import costs incentivize local manufacturing, supporting the **"Atmanirbhar Bharat"** goal.

Policy Landscape:

- **RBI's Role:** Limited intervention via forex reserves (~$570 bn) is used to smooth volatility, avoiding aggressive rupee defence.
- **Fiscal Measures (Govt):** Focus on import reduction through **PLI schemes** and **ethanol blending** to cut the oil import bill.
- **Structural Efforts:** Pursuing long-term trade infrastructure via the **IMEC** and reducing costs with the **National Logistics Policy**.
- **Global Alignment:** Supporting **dedollarisation** through BRICS+ and promoting local currency trade (e.g., with UAE, Russia).

Way Forward:

- **Strengthen Export Competitiveness:** Invest in high-value manufacturing and aggressively seek **FTAs** with major economies.
- **Diversify Energy Sources:** Accelerate renewables, **green hydrogen**, and ethanol blending to fundamentally cut oil import dependence.
- **Attract Long-term Capital:** Ensure **policy stability** and expedite approvals to secure sustained, higher **FDI inflows**.
- **Enhance Financial Depth:** Develop bond markets to absorb shocks; promote **rupee invoicing** for trade.
- **Calibrated RBI Support:** Smooth short-term volatility carefully while maintaining confidence, without exhausting reserves.

Conclusion:

The rupee's fall reflects structural gaps — trade imbalance, volatile capital flows, and import dependence. While it aids exports, unchecked depreciation fuels inflation and dents investor trust. True resilience lies in stronger fundamentals, diversified exports, and higher investor confidence. A growth-anchored stable rupee will secure macroeconomic stability and competitiveness.

GST 2.0: A STRATEGIC REFORM FOR INDIA'S ECONOMIC FUTURE

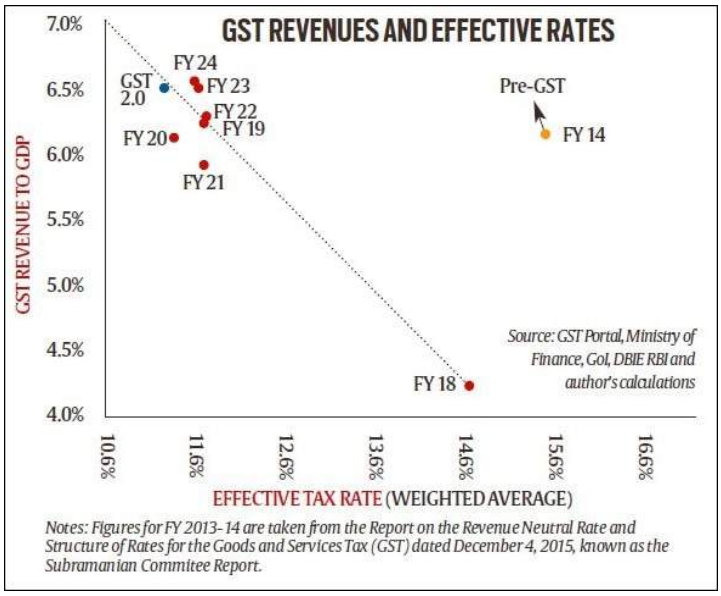
Context:

India is rolling out GST 2.0, a major tax reform aiming to simplify slabs, reduce compliance costs, and prioritise long-term growth over short-term revenue maximisation.

About GST 2.0: A Strategic Reform for India's Economic Future

Current Status of India & GST:

- **Launched in 2017:** GST unified multiple indirect taxes into one nationwide system, simplifying India's fragmented tax regime.
- **Current Structure:** Four slabs (5%, 12%, 18%, 28%) plus cess still create complexity and frequent classification disputes.
- **Revenue Collections:** Monthly inflows of ₹1.6–1.7 lakh crore show stability but remain below India's full potential.
- **Structural Problems:** Inverted duty structures and compliance paperwork increase costs for MSMEs and small traders.
- **Tax-to-GDP Ratio:** At ~11–12%, India's tax effort is much lower than global peers, indicating under-utilised capacity.



Need for Strategic Shift:

- **Simplification**: Collapsing multiple slabs into fewer rates will reduce confusion and boost compliance confidence.
- **Widen Compliance**: Easing entry norms encourages small businesses to enter the formal tax net voluntarily.
- **Boost Competitiveness**: Faster refunds and simpler logistics improve India's position in global trade.
- **Equity**: Taxing luxury and sin goods higher protects common citizens from disproportionate burdens.
- **Trust-based Taxation**: A non-adversarial regime builds taxpayer trust and reduces disputes with authorities.

Challenges Associated:

- **Short-Term Revenue Dip**: Initial loss of ~₹48,000 crore may worsen fiscal deficit pressures temporarily.
- **Implementation Risks**: IT glitches, limited training, and weak adaptation can derail smooth rollout.
- **State Resistance**: States fear losing compensation after 2026, straining Centre–State fiscal relations.
- **Classification Issues**: Even with fewer slabs, borderline products may spark legal and administrative disputes.
- **Global Precedent**: Malaysia's failed GST reform shows poor execution can undermine tax system credibility.

Significance of GST 2.0:

- **Economic Growth**: Lower rates can stimulate consumption and raise long-term revenues via the Laffer Curve.
- **Progressive Taxation**: Rich consumers of luxury goods bear higher taxes, ensuring fairness and justice.
- **Formalisation**: Small businesses join the formal sector under simplified registration schemes.
- **Export Competitiveness**: MSMEs benefit from faster refunds and fewer barriers in international markets.
- **Fiscal Consolidation**: Wider compliance expands the tax base, strengthening India's fiscal health.

Conclusion:

GST 2.0 is a strategic investment in India's economic future. Its success depends on smooth execution, federal cooperation, and taxpayer trust. Done right, it can drive India toward a $10 trillion, equitable, and efficient economy.

THE RISE AND RISKS OF HEALTH INSURANCE IN INDIA

Context:

The debate on India's path to Universal Health Care (UHC) has intensified with rising budgets for PMJAY and State Health Insurance Programmes (SHIPs). Critics argue that these insurance-driven models reinforce for-profit healthcare and neglect public health infrastructure.

About The Rise and Risks of Health Insurance in India:

Introduction:

Universal Health Care (UHC), envisioned by the **Bhore Committee (1946)**, remains distant for India even after eight decades. While **PMJAY and SHIPs** have expanded formal coverage to over 80% of the population, they raise questions about sustainability, equity, and the future of India's public health system.

Growth of Health Insurance in India:

- **PMJAY (2018)**: Provides ₹5 lakh cover per household per year for inpatient care, covering 58.8 crore individuals (2023-24).
- **State Schemes (SHIPs)**: Most states run parallel

programmes, together covering a similar population with budgets of ~₹16,000 crore.

- **Combined Expenditure**: ~₹28,000 crore annually, growing at 8–25% in real terms (2018–2024).
- **Coverage vs Utilisation**: While official coverage is high, only 35% of insured hospital patients could actually use the schemes (HCES 2022-23).

Fault Lines in Health Insurance Expansion

1. **For-Profit Medicine Bias**
   - ~2/3 of PMJAY funds flow to **private hospitals**, reinforcing commercialised healthcare.
   - Lack of strong regulation leads to overcharging, unnecessary procedures, and ethical compromises.
2. **Neglect of Primary Care**
   - Insurance skews resources towards **hospitalisation**, ignoring **primary and preventive health services**.
   - With India's ageing population, tertiary care costs risk crowding out investments in rural PHCs and OPD services.
3. **Utilisation Challenges**
   - Awareness gaps: beneficiaries often do not know how to use coverage.
   - Private hospitals discourage insurance patients due to **low reimbursement rates**.
   - Disadvantaged groups face greater barriers.
4. **Discrimination in Care**
   - Public hospitals prefer insured patients (extra funds).
   - Private hospitals prefer uninsured patients (higher billing).
   - Leads to inequity within the healthcare system.
5. **Financial Sustainability & Provider Exit**
   - Pending dues under PMJAY: **₹12,161 crore**, exceeding its budget.
   - Over **600 hospitals have exited PMJAY** due to delays in reimbursements.
6. **Fraud & Corruption**
   - NHA flagged **3,200 hospitals** for fraudulent activities (ghost patients, inflated bills, unnecessary surgeries).
   - Weak audit systems, lack of transparency in scheme portals.

Structural Risks for UHC

- **Underfunded Public Health**: India's public expenditure on health is just **1.3% of GDP (2022)** vs world average **6.1%**.
- **Profit-Driven System**: Insurance strengthens private sector dominance without addressing quality gaps.
- **Exclusionary Tendencies**: Despite high coverage, **out-of-pocket expenditure** remains one of the highest globally.

International Comparisons

- **Thailand, Canada**: Social health insurance is a part of UHC but built on **non-profit providers, universal coverage, and strong regulation**.
- **India's Difference**: Insurance is **targeted, profit-oriented, and poorly regulated**, unlike successful models abroad.

Policy Way Forward

1. **Strengthen Public Health Infrastructure**
   - Expand **primary health centres, diagnostics, OPD services**, and rural health workforce.
   - Prioritise preventive care over hospitalisation-centric funding.
2. **Regulate Private Sector**
   - Enforce **standard treatment protocols**, price caps, and strict monitoring of empanelled hospitals.
3. **Improve Utilisation & Awareness**
   - Community outreach and digital literacy to help beneficiaries navigate schemes.
   - Simplify claims and grievance redressal systems.
4. **Financial Sustainability**
   - Ensure timely reimbursement; explore **direct budgetary allocations** instead of insurance intermediaries.
5. **Towards True UHC**
   - Raise public health spending to **2.5% of GDP (National Health Policy 2017 target)**.
   - Move from **insurance-driven patchwork** to **publicly funded, universally accessible healthcare**.

Conclusion:

Health insurance schemes such as PMJAY and SHIPs provide temporary relief but risk institutionalising a profit-driven, hospitalisation-heavy system. True UHC requires public investment in primary care, regulation of private providers, and equity-focused reforms. Without these, health insurance remains a painkiller, not a cure, for India's ailing healthcare system.

Topics: Major crops cropping patterns in various parts of the country, different types of irrigation and irrigation systems storage, transport and marketing of agricultural produce and issues and related constraints; e-technology in the aid of farmers.

COUNTERFEIT SEEDS & GI CROPS LIKE BASMATI

Context:

The government unveiled a plan to combat **counterfeit and substandard seed fraud** threatening GI-tagged crops like **Basmati rice**.

- The strategy includes **digital seed traceability (SATHI system)** and an amendment to the **Seeds Act, 1966**, to safeguard farmers and protect India's agricultural reputation.

About Counterfeit Seeds & GI Crops like Basmati:

Significance of GI Crops like Basmati:

- **Export value**: Basmati rice contributes nearly 60% of India's rice export earnings, making it a vital foreign exchange earner. Its premium brand positioning enhances India's dominance in the global rice trade.
- **Reputation marker**: GI crops showcase unique agro-climatic traits and traditional practices. They act as cultural ambassadors reflecting India's heritage and agricultural diversity.
- **Farmer livelihood**: Millions of farmers rely on GI-certified seeds for predictable yields and better market prices. Fake seeds directly jeopardise their income stability.
- **Soft power**: GI-tagged crops like Basmati, Darjeeling tea, and Alphonso mango enhance India's global image. They strengthen agri-diplomacy and support India's trade negotiations.

The Problem: Fake and Substandard Seeds

- **Seed failure**: Counterfeit or uncertified seeds often fail to germinate or yield, pushing farmers into debt traps. This leads to lower farm productivity and economic distress.
- **Reputation risk**: Fake seeds threaten the credibility of GI crops internationally. Export rejection or poor-quality produce can damage India's agricultural brand value.
- **Data**: In 2024–25, of 2.53 lakh samples tested, 32,525 were substandard, the highest in West Bengal, Tamil Nadu, and MP. This reflects the scale of the counterfeit seed menace.
- **Illegal sales**: Unauthorised sellers distribute seeds under fake labels, bypassing Agriculture Ministry approvals. Such malpractice weakens regulatory enforcement and trust.
- **Regional hotspots**: States like Telangana, Rajasthan, Gujarat, and West Bengal have reported large cases of seed fraud. These regions are vulnerable due to vast crop cultivation and market dependence.

Government Response:

- **Digital Seed Traceability (SATHI Project):**
  - **Phase I (2023):** Implemented in 23 states/UTs, it covered seed production and processing agencies. It created a digital base for monitoring seed quality at source.
  - **Phase II (2025):** Extends coverage to dealers and farmers with QR codes for authentication. Farmers can verify seed origin and avoid falling prey to fake packets.
- **Amendment to the Seeds Act, 1966:**
  - **Existing law:** Certification of seeds is not mandatory, allowing private players to market "truthfully labelled" seeds. This loophole weakens farmer protection.
  - **Proposed changes:** Make certification and traceability compulsory with accountability fixed on dealers and companies. It strengthens regulatory oversight and penalises violators.
- **Seed Testing Infrastructure:**
  - **Labs:** India operates 178 Seed Testing Labs (STLs) across states. These facilities ensure certified seed quality before reaching farmers.
  - **Global standards:** 10 labs are NABL-accredited and 2 are ISTA-accredited. Accreditation enhances international credibility and assures compliance with global benchmarks.

Size of India's Seed Industry:

- **Current market:** Valued at $6.3 billion (~₹55,200 crore), the seed industry is already one of the largest in Asia. It plays a crucial role in ensuring food security.
- **Projected growth:** Expected to reach $12.7 billion by 2028 and $20 billion by 2040, with a 10% CAGR. Rising food demand and agri-tech innovations will drive this growth.

- **Private sector dominance:** 98% in cotton, ~70% in field crops and vegetables, showing corporate dominance in high-value seed segments.
- **Public-private synergy:** Most marketed varieties originate from ICAR research. This reflects reliance on public R&D while private players handle large-scale dissemination.

Challenges Ahead:

- **Enforcement gaps:** Raids and FIRs are conducted but counterfeit seed distribution persists. Weak ground-level monitoring creates regulatory loopholes.
- **Farmer vulnerability:** Small and marginal farmers often lack awareness of certification norms. They are easily duped by low-cost but substandard seed sellers.
- **Logistics:** Traceability requires robust physical and digital supply chains. Rural connectivity gaps and weak IT adoption hinder nationwide implementation.
- **International credibility:** Fake seeds in GI crops like Basmati can lead to export rejections. This directly impacts India's global reputation and foreign exchange earnings.
- **Equity gap:** Smaller seed companies may struggle with high compliance costs. This risks market monopolisation by bigger firms with stronger infrastructure.

Way Forward:

- **Universal Digital Seed Traceability:** Scale up SATHI across all states, ensuring farmer training for QR-based verification. This will guarantee authenticity from lab to farm.
- **Legislative reform:** Fast-track Seeds Act amendments to mandate certification. Stronger penalties will deter counterfeit seed players.
- **Awareness drives:** Conduct literacy campaigns for farmers on seed traceability and certified dealers. Empower farmers to demand accountability.
- **Stronger penalties:** Impose criminal liability and licence cancellation for counterfeit manufacturers. This creates deterrence against fraud.
- **Public-private collaboration:** Encourage joint R&D in blockchain-enabled traceability. Expand accredited seed labs for higher coverage and reliability.
- **Global branding:** Market GI crops with authenticity certifications in global platforms. This secures India's exports and strengthens farmer incomes.

Conclusion:

Counterfeit seeds pose a silent but severe threat to India's farmers, exports, and agri-credibility. GI crops like Basmati embody both economic and cultural value, making their protection vital. With digital traceability, stricter laws, and farmer awareness, India can safeguard seed sovereignty.

INDIA'S PATH TO ATMANIRBHARTA IN MILLETS

Context:

NITI Aayog released its report "Strategies and Pathways for Accelerating Growth in Pulses towards the Goal of Atmanirbharta".

- While focused on pulses, it highlights broader lessons for self-reliance in food crops, including millets, which share similar challenges of productivity, price stability, and sustainability.

About India's Path to Atmanirbharta in Millets:

Current Status & Trends of Millets in India:

- **Production Share** – India produces about **41% of global millets**, making it the largest producer, with ~16 million tonnes annually. This positions India as a global hub for millets.
- **Regional Concentration** – States like **Rajasthan, Maharashtra, Karnataka, Uttar Pradesh, and Madhya Pradesh** account for over 80% of millet production, showing uneven geographical spread.
- **Consumption Decline** – Despite high output, per capita millet consumption has fallen from **32 kg/year in the 1960s to ~4 kg/year today**, replaced by rice and wheat in PDS and diets.
- **Export Trends** – India exported nearly **1.8 MT of millets in 2022–23**, mainly to UAE, Nepal, and Saudi Arabia, reflecting growing international demand.
- **Policy Focus** – The **Union Budget 2023–24** renamed millets as **"Shree Anna"** and earmarked resources for research, processing, and market linkages to revive millet consumption.

Figure 3.4: Pulses as % of Total Foodgrains Area and Production (1960-61 to 2022-23)

Source: Authors' computation, data from DES, MoA&FW

Importance of Millets:

- **Nutritional Value** – Millets are rich in **iron, calcium, fiber, and proteins**, crucial to fight malnutrition and anemia, especially among women and children.
- **Climate Resilience** – Millets need **70% less water than rice** and withstand drought, making them

suitable for rainfed, arid, and climate-stressed regions.

- **Farmer Livelihoods** – Being low-input crops, millets reduce dependence on fertilizers and irrigation, lowering production costs for smallholders.
- **Food Security** – Inclusion of millets in **Mid-Day Meals, ICDS, and PDS** enhances nutritional security for vulnerable populations.
- **Global Recognition** – With India branding millets as "Shree Anna", millets are now positioned as a **superfood**, strengthening India's agri-diplomacy and export potential.

Initiatives Taken So Far:

- **National Food Security Mission (NFSM-Millets)** – Promotes area expansion, seed distribution, and productivity enhancement in millet-growing regions.
- **Shree Anna Mission (2023)** – A six-year mission to boost millet research, processing, branding, and market integration nationwide.
- **Millets in Schemes** – States like Karnataka (with "Ksheera Bhagya") integrated millets into school meals, improving acceptance and demand.
- **International Push** – India led the UNGA resolution declaring **2023 as International Year of Millets**, organizing global millet fairs and buyer-seller meets.
- **Export Promotion** – APEDA has supported branding, GI tagging, and millet product exports to Middle East, USA, and EU.

Challenges Faced by Millets:

- **Declining Consumer Preference** – Urban diets favor rice and wheat due to PDS pricing and convenience, pushing millets to the margins.
- **Productivity Gap** – Millets yield **~1.2 t/ha**, lower than rice/wheat, due to limited R&D and hybrid seed availability.
- **Market Linkages** – Fragmented value chains, weak FPO penetration, and lack of MSP-backed assured procurement hinder farmer confidence.
- **Post-Harvest Issues** – Poor processing technology, storage losses, and low investment in millet-based food industry restrict value addition.
- **Policy Bias** – Heavy subsidies for rice and wheat under NFSA and irrigation skew discourage millet cultivation in rainfed belts.

Strategic Framework for Atmanirbharta in Millets:

- **Horizontal Expansion** – Cultivate millets in **rice fallows and degraded lands**, particularly in Eastern India, to expand acreage sustainably.
- **Vertical Expansion** – Invest in **high-yield, bio-fortified, and climate-resilient millet varieties**, supported by stronger seed systems.
- **Cluster-Based Model** – Adopt a **district-wise crop cluster strategy** (like pulses) for region-specific interventions and better productivity gains.
- **Value Chain Strengthening** – Establish **processing hubs, branding units, and FPO-led aggregation models** to integrate farmers into markets.
- **Climate-Smart Practices** – Promote **organic, water-efficient, and pest-resistant millet farming**, aligned with India's SDG and climate goals.

Way Ahead:

- **Integration into NFSA & ICDS** – Ensure compulsory inclusion of millets in food security schemes to expand domestic demand.
- **R&D Boost** – Strengthen research in **bio-fortified, short-duration millet hybrids** and enhance seed replacement rates.
- **Export-Oriented Value Chains** – Build **GI-tagged millet brands** and premium products for global health-conscious consumers.
- **Public Procurement Reform** – Guarantee MSP-backed procurement and set up decentralized procurement centers for millets.
- **Awareness Campaigns** – Launch nation-wide millet promotion drives, linking them with **nutrition, lifestyle, and climate resilience.**

Conclusion:

Millets offer India a **triple advantage** of nutrition security, climate resilience, and farmer welfare. With strong institutional support and global branding, they can re-emerge as the **"grain of the future."** Achieving Atmanirbharta in millets requires coordinated action across production, markets, and consumption policies.

Topics: Effects of liberalization on the economy, changes in industrial policy and their effects on industrial growth.

INDIA'S MANUFACTURING MOMENTUM

Context:

India's IIP surged 3.5% YoY in July 2025, led by 5.4% manufacturing growth, and HSBC Manufacturing PMI touched 59.3, its highest in 16 months.

About India's Manufacturing Momentum:

Current Data & Status:

- **IIP Growth:** IIP grew 3.5% in July 2025 vs 1.5% in June; manufacturing growth stood at 5.4%, showing demand revival.
- **Export Performance:** Merchandise exports rose 2.52% YoY (Apr–Aug 2025) to US$ 184.13 billion, led by electronics, pharma, and auto.
- **Employment Gains:** Unemployment rate eased to 5.0% (male UR at 5-month low), female WPR rose to 32%, showing inclusive job growth.
- **FDI Flows:** India clocked US$ 81.04 bn FDI inflow in FY25 (+14% YoY); manufacturing FDI grew 18% to US$ 19.04 bn.

Drivers of Manufacturing Sector:

- **PLI Scheme:** ₹1.97 lakh crore scheme across 14 sectors incentivizes production, boosts exports, and attracts global OEMs.
- **National Manufacturing Mission:** Integrates ministries, focuses on clean-tech manufacturing (solar, EV batteries, green hydrogen).
- **Infrastructure Push:** PM GatiShakti and Industrial Corridors are lowering logistics costs and improving connectivity.
- **GST 2.0 Reforms:** Two-slab GST, rationalized rates, and faster refunds reduce compliance costs and stimulate domestic demand.
- **Electronics & Mobile Revolution:** 150x jump in mobile manufacturing units (2 → 300), exports crossed ₹2 lakh crore, reducing import dependence.

Impacts on Economy:

- **GDP Contribution:** Manufacturing contributes 17% of GDP; target is 25% by 2030, helping sustain 7–8% growth trajectory.
- **Job Creation:** 17 crore jobs created in last decade; manufacturing share in employment rose from 6% (2004-14) to 15% (2014-24).
- **Export Competitiveness:** Electronics, pharma, and auto sectors anchor India's export diversification, reducing current account pressure.
- **Investment Confidence:** Rising FDI inflows reflect global trust in India's policy stability and industrial potential.
- **Regional Development:** Emergence of new manufacturing clusters (PM MITRA parks, EMCs) drives balanced growth across states.

Challenges:

- **Infrastructure Gaps:** Logistics cost still ~13-14% of GDP, higher than global average, hurting competitiveness.
- **Skill Mismatch:** Shortage of Industry 4.0-ready workforce; need for advanced vocational training and apprenticeships.
- **Regulatory Hurdles:** Land acquisition delays, multiple compliance layers discourage MSME participation.
- **Global Risks:** Geopolitical tensions, protectionist policies, supply chain disruptions may impact export momentum.
- **Environmental Concerns:** Need for green manufacturing to meet Net Zero 2070 targets and ESG norms.

Way Ahead:

- **Strengthen Plug-and-Play Parks:** Provide ready-to-use infrastructure to MSMEs, reduce gestation period for new projects.
- **Skill India 4.0:** Create Centres of Excellence, upgrade ITIs, and align curriculum with AI, robotics, and digital manufacturing.
- **Tariff Rationalization:** Lower customs duties on raw materials (steel, copper, aluminum) to avoid tax-exporting.
- **Boost MSMEs:** Provide concessional credit, technology upgradation grants, and digital platforms for global market access.
- **Global Integration:** Accelerate FTAs (UK, EU), deepen role in supply-chain alliances, and secure energy/ raw material sources abroad.

Conclusion:

India's manufacturing momentum signals a

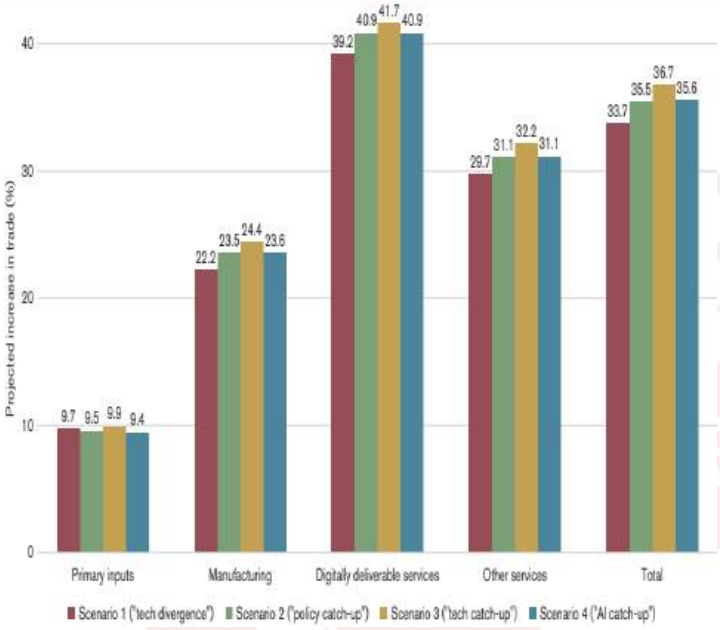
structural shift, not a short-term cycle. With sustained reforms, skill-building, and green industrialization, India can become a **US$ 1 trillion manufacturing economy by FY26**. This transformation is central to realizing **Viksit Bharat @ 2047**, generating jobs, exports, and global competitiveness.

WORLD TRADE REPORT 2025

Context:

The World Trade Organization (WTO) released its World Trade Report 2025, highlighting that Artificial Intelligence (AI) could raise global trade by 34–37% and GDP by 12–13% by 2040 if digital divides are bridged and inclusive policies are adopted.

Figure B.3: AI is projected to expand global trade substantially by 2040, with larger increases in digitally deliverable services (2025-40)



About World Trade Report 2025:

What It Is?

- **Annual Flagship Publication:** Published by the **World Trade Organization (WTO)** to analyze trade trends, policies, and the multilateral trading system's future.
- **2025 Theme:** *"Making Trade and AI Work Together to the Benefit of All"* – explores AI's impact on global trade and inclusive growth.

Key Highlights of the Report:

1. **AI as a Trade Multiplier:** AI adoption could boost global trade in goods and services by **nearly 40% by 2040**, driven by lower trade costs and productivity gains.
2. **Global GDP Gains:** The report projects **12–13% rise in global GDP** under scenarios where digital gaps narrow and AI adoption spreads across income groups.
3. **AI-Enabled Goods Trade:** Trade in AI-enabling goods (chips, semiconductors, servers) already totals **USD 2.3 trillion (2023)** and will expand further with open trade regimes.
4. **Digital Divide Challenge:** Without policy intervention, low- and middle-income economies risk exclusion from AI-led trade benefits due to poor connectivity and compute capacity.
5. **Labour Market Impact:** AI could displace routine cognitive jobs (translation, transcription) but raise demand for data annotation, engineering, and AI oversight roles.
6. **Regulatory Fragmentation:** Quantitative restrictions on AI-related goods rose from **130 (2012) to 500 (2024)** — a trend the WTO warns could stifle innovation and raise costs.
7. **AI-Trade Synergy:** AI reduces logistics costs, enables predictive supply chain management, automates customs clearance — improving trade efficiency for SMEs.
8. **Inclusivity Imperative:** The report stresses reskilling, social protection, and open data access to prevent widening inequality and ensure equitable distribution of AI gains.
9. **WTO's Role:** Calls for expanding participation in **Information Technology Agreement (ITA)** and updating **GATS** commitments to include AI-driven digital services.

Opportunities:

- **Lower Trade Costs:** AI-enabled supply chain optimization, predictive logistics, automated customs.
- **New Trade in Services:** AI-powered digital services (telemedicine, analytics) expand export potential.
- **Knowledge Diffusion:** Openness boosts cross-border AI innovation — 10% rise in digital trade → 2.6% more AI patent citations.
- **Inclusive Growth Potential:** AI can reduce skill wage gaps slightly, benefiting low- and middle-income economies if adopted widely.
- **Development Entry Points:** Data annotation, cloud services, and local adaptation of AI models create jobs for developing nations.

Challenges:

- **Digital Infrastructure Gap:** Low-income countries lack computing power, connectivity, and skilled workforce.

- **Regulatory Fragmentation:** Data localization, export controls, and divergent AI standards raise trade barriers.
- **Concentration of AI Capabilities:** Dominance of a few countries/firms risks monopolistic control over AI inputs.
- **Labour Market Disruption:** Job displacement in translation, transcription, and support functions may widen inequality.
- **Energy & Sustainability Concerns:** Data centers already consume 1.5% of global electricity — green transition needed.

WTO Recommendations:

- **Bridge Digital Infrastructure Gaps:** Invest in broadband, cloud, and computing capacity for low- and middle-income economies to enable equal AI participation.
- **Inclusive Workforce Reskilling:** Launch global AI skilling initiatives to prepare workers for new AI-enabled roles, avoiding job polarisation.
- **Open & Predictable Trade Policy:** Reduce tariffs and non-tariff barriers on AI-enabling goods, promote interoperability of AI standards, and prevent protectionist measures.
- **Global AI Governance:** Develop multilateral frameworks for data flows, algorithmic transparency, and ethical AI to build trust and ensure responsible deployment.
- **Sustainability Alignment:** Encourage green AI — energy-efficient data centers, carbon-neutral cloud services — so AI growth aligns with climate goals.

Conclusion:

AI represents a **transformative opportunity** for trade-led growth, but only if digital divides are closed and regulatory fragmentation is avoided. A **coherent mix of trade, technology, and** social policies can ensure AI becomes a tool for inclusive global prosperity rather than a driver of inequality

RATIONALISING TARIFFS FOR A COMPETITIVE INDIA

Context:

India has been labelled the "Tariff King" by the US, which recently imposed **50% tariffs on Indian goods**, reigniting debate on India's high import duties.

- Experts argue that India must rationalise tariffs to boost competitiveness, attract investment, and integrate into global value chains.

About Rationalising Tariffs for a Competitive India:

India's Tariff Landscape:

- **High Average Tariffs** – India has the **2nd highest simple average tariff (16.2%)** among G20 countries, after Turkey.
- **Agriculture Protectionism** – Trade-weighted agricultural tariffs are **64.3%**, the highest globally, to shield 46% of workforce dependent on farming.
- **Non-Agricultural Duties** – Industrial goods face 9.2% trade-weighted tariff, lower but still higher than Argentina, EU, and China.
- **Irrational Dispersion** – Duties vary widely (e.g., cotton duty-free, milk powder 60%, food preparations 150%), distorting resource allocation.
- **Trade Negotiation Barrier** – High tariffs are a sticking point in **India-UK FTA** and **India-EU BTIA**, limiting deeper trade integration.

Need for Tariff Rationalisation:

- **Boost Competitiveness** – Lower tariffs encourage efficiency and innovation, helping Indian firms compete globally (post-1991 auto sector case study).
- **Consumer Welfare** – Reduces prices of essential imports like edible oil, easing inflationary pressure and improving nutrition security.
- **Attracting FDI & GVC Entry** – Predictable tariff regime helps India join **global value chains** and draw manufacturing investment (China+1 strategy).
- **Diplomatic Leverage** – Strengthens India's credibility in trade negotiations, helping finalise pending FTAs with EU, UK, and GCC.
- **Avoid Trade Retaliation** – Rational tariffs reduce risk of punitive duties like recent **US 50% tariff** on Indian exports.

Implications of Tariff Rationalisation:

- **Economic Growth** – Boosts exports, integrates India with global supply chains, raising GDP and job creation.
- **Farmer Transition** – Controlled liberalisation with support schemes can shift farmers to high-value crops (horticulture, pulses).
- **Price Stability** – Cheaper imports of raw materials

reduce production costs, benefiting MSMEs and consumers.

- **Global Image** – Projects India as a responsible trade partner, improving negotiating power in WTO and G20.
- **Innovation Push** – Competition incentivises domestic firms to invest in R&D, improving productivity and product quality.

Challenges to Tariff Rationalisation:

- **Farmer Backlash** – Lower duties may hurt small farmers growing crops like milk, sugar, and pulses, risking political protests.
- **Revenue Dependence** – Customs duties contribute a significant share to tax revenue, creating fiscal constraints.
- **MSME Protection** – Small industries fear cheap imports could wipe them out without adequate support or productivity boost.
- **Infrastructure Deficit** – Poor logistics and storage facilities weaken India's competitiveness despite lower tariffs.
- **Policy Inertia & Lobbying** – Strong sectoral lobbies resist duty cuts on protected commodities (dairy, poultry).

Suggested Reforms:

- **Rational Tariff Structure:**
  - **Tiered Approach:**
    1. Raw materials: 0–10%
    2. Non-sensitive goods: 10–20%
    3. Sensitive goods: 20–35%
    4. Luxury items: 35–50%
  - **Adopt Tariff Rate Quotas (TRQs):** Protect small farmers while allowing limited low-duty imports (e.g., pulses, dairy).
- **Boost Agricultural Productivity:**
  - Double **Agri-R&D spending to 1% of Agri-GDP** (OECD average is 3%).
  - Promote **precision farming & micro-irrigation** for better yield per drop.
- **Reform Fertiliser Subsidies:**
  - Shift to **DBT-based direct cash support** to farmers, reduce leakage, free prices for efficiency.
- **Strengthen Value Chains:**
  - Invest in storage, cold chains, and logistics to reduce **post-harvest losses (≈15–20%)**.
  - Encourage Farmer Producer Organisations (FPOs) for aggregation and better market access.
- **Align with GST Logic:**
  - Create a simple, transparent tariff code to reduce litigation and discretion.
  - Use digital customs platforms for faster clearance, reducing compliance burden.

Conclusion:

India must **shed its "Tariff Maharaja" image** and move towards **competitive, innovation-led trade policy**. Imports should be seen as a **growth strategy, not a threat**, aligning with Ricardo's principle of comparative advantage. Reforms will make India **globally resilient**, benefit farmers through higher productivity, and improve consumer welfare.

INDIAN GENERICS GLOBAL PUBLIC GOOD: PHARMA DIPLOMACY & TRADE STRATEGY

Context:

India's pharmaceutical exports face pressure as the U.S. imposes tariffs and stricter IP demands, threatening the viability of Indian generics in their biggest market. Despite this, Indian generics remain the backbone of affordable healthcare worldwide, saving billions in costs.

About Indian Generics Global Public Good: Pharma Diplomacy & Trade Strategy

Current Pharma Status:

- India is the **largest supplier of generics** to over 200 countries, cementing its role as the "Pharmacy of the World."
- The **U.S. accounts for 31.35%** of India's pharma exports and imports **47% of its generics** from India.
- In 2022, Indian generics saved the U.S. **USD 219 billion** in healthcare expenditure.
- The global generics market will hit **USD 614 billion by 2030**, with India as a leading player.
- Challenges include **U.S. tariffs, dependence on Chinese APIs, and rising global competition** in generics.

Significance of Indian Generics:

- **Affordable Medicines:** Indian generics are 20–25% of branded prices, making drugs for diabetes, cancer, HIV, etc., accessible worldwide.
- **Global Public Health:** They form over **90% of**

prescriptions in the U.S. and are critical for developing nations.

- **Economic Role:** Pharma exports contribute **~USD 25 billion annually** and generate millions of jobs in India.
- **Strategic Leverage:** Generics boost India's global soft power, evident in initiatives like **Vaccine Maitri** during COVID-19.
- **Innovation Potential:** India is emerging as a leader in biosimilars, vaccines, and low-cost R&D-based pharma solutions.

Need for Strategic Shift:

- India must move beyond **short-term tariff concessions** to long-term strategic positioning in trade negotiations.
- Strongly resist **TRIPS-plus demands** that would extend drug monopolies and delay entry of low-cost generics.
- Reduce dependence on U.S. markets by expanding exports to **Africa, Latin America, ASEAN, and Central Asia**.
- Ensure **technology transfer and joint R&D** in exchange for pricing concessions to strengthen domestic pharma capacity.
- Position Indian generics as a **global public good**, aligning trade policy with **SDG-3: Health for All**.

Challenges:

- **Trade Barriers:**
  - U.S. levying 26% tariff + 25% penalty on imports.
  - Push for zero tariffs in bilateral negotiations without reciprocal benefits.
- **IPR Pressures:**
  - Demands for stronger patent protections beyond TRIPS.
  - Push for **data exclusivity and extended monopolies**, delaying generic entry.
- **Domestic Constraints:**
  - Dependence on China for APIs (Active Pharmaceutical Ingredients).
  - Regulatory hurdles and fragmented R&D ecosystem.
- **Global Competition:** Rise of alternative hubs in **China, Brazil, Eastern Europe**.
- **Public Health Risks:** Restrictive IP rules would **increase medicine prices** globally, worsening inequity.

Initiatives & Policy Measures:

- **TRIPS Flexibilities:** India has maintained compulsory licensing provisions to ensure affordable medicines.
- **India–US TRUST Initiative:** For collaboration in biotech, pharma, and health technologies.
- **Make in India + PLI Scheme for Pharma:** To strengthen domestic production and reduce API dependence.
- **South–South Cooperation:** India exploring joint ventures in Africa, Latin America, and ASEAN.
- **Health-Tech Diplomacy:** Sharing vaccine platforms, generics technology with developing nations.

Way Forward:

- **Leverage Negotiating Capital:**
  - Demand comprehensive review of TRIPS and resist TRIPS-plus provisions.
  - Emphasise generics' role in **global health security** post-COVID.
- **Diversify Export Markets:**
  - Reduce overdependence on U.S. by expanding into **Africa, Latin America, ASEAN, Central Asia**.
- **Promote Joint Ventures:**
  - Encourage collaborations in the Global South and with EU/US firms for **co-manufacturing & R&D**.
- **Strengthen Domestic Capacity:**
  - Invest in **API self-reliance**, R&D hubs, and regulatory reforms.
- **Use Public Health Diplomacy:**
  - Position generics as part of India's **soft power** — like Vaccine Maitri.
  - Build coalitions at WTO, WHO, and BRICS to counter Big Pharma monopolies.
- **Link Concessions with Tech Transfer:**
  - Any trade-off in pricing/export terms must be tied to **technology sharing and local capacity-building**.

Conclusion:

Indian generics are the lifeline of global healthcare, saving billions in costs and lives. India must reframe them as a global public good, resist unfair IP regimes, and diversify partnerships — safeguarding health worldwide while cementing its role as the Pharmacy of the Global South.

GROWING CHALLENGES ON INDIA'S EXPORT FRONT

Context:

India's merchandise exports face major challenges as the US imposed a 50% tariff on a substantial share of exports, threatening stagnation in its largest market (≈20% share). This comes at a time when India's global export share has stagnated despite earlier gains.

About Growing Challenges on India's Export Front:

Historical Trends in India's Export Competitiveness:

- **Early Gains (1990s–2010):**

- Exports as a % of GDP rose from **7.1% in 1990 to 20.4% in 2010**.
- Both merchandise and services contributed, supported by globalisation and reforms.

- **Reversal and Stagnation (2010–2024):**
  - Share fell to **17.7% by 2020**, recovering marginally to **21.2% in 2024**, almost at 2016 levels.
  - India's global **merchandise share rose from 0.51% (1990) to 1.81% (2024)** — most gains front-loaded in the first two decades.
- **Sectoral Performance:**
  - **Agriculture:** rose from 0.85% (1990) → 2.22% (2024).
  - **Fuel & Mining:** sharp jump, 0.32% → 2.62% (led by petroleum).
  - **Manufacturing:** tripled to 1.73%, still lagging; textiles (5.77%), pharma (2.56%) and steel (2.64%) remain bright spots.
- **Services Outperforming Goods:**
  - Share of global services exports: **2.9% (2010) → 4.2% (2024)**.
  - IT-BPM, telecom, business services dominate; other services remain weak.

Structural Challenges:

- **Tariff Shock from US:**
  - 50% tariffs weaponise trade, undermining WTO norms.
  - Will likely depress India's most buoyant market, compounding global slowdown effects.
- **Competitiveness Erosion:**
  - Declining merchandise share indicates structural inefficiencies.
  - Rising costs, poor logistics, regulatory complexity constrain exports.
- **Over-Dependence on Services:**
  - Services exports share is **double that of goods**.
  - Narrow base: IT/ITES dominate; construction, telecom and business services contribute ≈40%.
- **Narrow Manufacturing Depth:**
  - Few competitive sub-sectors (textiles, pharma, steel, chemicals, telecom equipment).
  - Most high-value industries (electronics, precision machinery, advanced materials) remain underrepresented.
- **Global Headwinds:**
  - Protectionism, tariff & non-tariff barriers, reshoring/nearshoring trends.
  - WTO's weakened dispute settlement reduces recourse for India.

Initiative taken so far:

- **Export Promotion Mission (EPM):** Flagship 2025 initiative with sector-specific programs like *Niryat Protsahan* (easy credit for exporters) and *Niryat Disha* (market access, branding, logistics).
- **RoDTEP Scheme:** Refunds hidden central, state, and local taxes on exports; expanded in 2025 to cover steel, pharma, and chemicals, including DTA units.
- **Simplified EPCG Scheme:** Allows duty-free import of capital goods for export production; 2025 reforms eased compliance, deadlines, and fees for struggling sectors.
- **BHARATI Initiative for Agri-Food Exports:** APEDA's 2025 program to incubate 100 agri-food startups, integrating AI quality checks and blockchain traceability for export readiness.
- **E-Commerce Export Hubs:** Creates hubs with warehousing, customs clearance, and logistics support; higher courier export threshold benefits MSMEs and small sellers.

Implications:

- **Economic Growth:** Export stagnation will drag GDP, already heavily reliant on domestic demand.
- **Employment:** Weak manufacturing exports stall job creation in labour-intensive industries (textiles, leather, light engineering).
- **Balance of Payments:** Rising import bills (energy, electronics) without robust exports threaten external stability.
- **Geopolitical Leverage:** Shrinking trade share weakens India's bargaining power in global trade negotiations.

Way Forward:

- **Strengthen Competitiveness of Manufacturing:**
  - Improve logistics (reduce cost from 13–14% of GDP to global benchmark 8%).
  - Ease compliance, integrate into **global value chains (GVCs)**.
  - Focus on electronics, EVs, green tech, semiconductors.

- **Diversify Export Markets:**
  - Reduce dependence on US/EU by expanding to Africa, Latin America, ASEAN.
  - Leverage FTAs (UAE, Australia, UK under negotiation).
- **Deepen Services Diversification:**
  - Beyond IT, strengthen **healthcare, tourism, education, financial services, creative industries**.
- **Policy & Institutional Support:**
  - WTO reform advocacy; parallel bilateral/ multilateral pacts.
  - Incentivise R&D, quality upgradation for MSME exporters.
- **Agriculture & Fuels:**
  - Enhance agro-processing exports, value addition in petrochemicals.
  - Move from raw commodities to branded, processed products.

Conclusion:

India's exports face weak merchandise growth and falling global share, showing both external shocks and domestic competitiveness loss. Strengthening manufacturing, diversifying markets, and expanding services are key to regaining export momentum

Topics: Infrastructure: Energy, Ports, Roads, Airports, Railways etc.

SEMICONDUCTOR DESIGNERS POWER INDIA'S CHIP DREAMS

Context:

India has approved 10 semiconductor fabrication and assembly projects under the ₹76,000 crore Semicon India Mission, while chip design is booming with India hosting 20% of global chip designers.

About Semiconductor Designers Power India's Chip Dreams:

Current Status:

- **Design Powerhouse** – India accounts for 20% of global semiconductor design engineers (~1.25 lakh), with 3,000 chips designed annually.
- **Policy Push** – ₹76,000 crore Semicon India Programme offers 50% capital support, with states adding 20–25%.
- **Manufacturing Progress** – Micron's ₹22,500 crore ATP facility in Gujarat is under construction, set to start operations in 2024.
- **R&D Initiatives** – Chips to Startup (C2S) programme aims to train 85,000 engineers in 5 years.
- **Global Context** – Semiconductor consumption in India projected to reach $110 billion by 2030, ~10% of global share.

Drivers of Semiconductor Design & Manufacturing:

- **Geopolitical Realignment** – "China+1" diversification encourages firms to shift capacity to India.
- **Market Size Advantage** – India is the world's fastest-growing consumer electronics market and second-largest smartphone producer.
- **Policy Incentives** – PLI, DLI, SPECS schemes make India globally competitive by neutralizing cost disadvantages.
- **Skilled Talent Base** – 8+ lakh engineers graduate yearly; access to EDA tools has democratized chip design.
- **R&D & Academia Linkages** – IITs, IISc, and IIITs are working with Synopsys, Cadence, Lam Research for frontier-level projects.

Impacts on Economy:

- **High-Value Jobs** – Semiconductor sector jobs have a multiplier of 6.7, creating ecosystem employment.
- **Export Growth** – Electronics exports projected to quintuple by 2026, helping narrow trade deficit.
- **Strategic Security** – Domestic chip capacity reduces overdependence on imports, crucial for defence & telecom.
- **Innovation Push** – IP creation and patents in chip design strengthen India's position in the global tech value chain.
- **Regional Development** – New semiconductor hubs in Gujarat, Karnataka, Odisha will decentralize growth.

Key Initiatives Taken:

- **Semicon India Programme (₹76,000 Cr):** 50% capital support for fabs, OSAT/ATMP facilities, and display fabs.
- **Design Linked Incentive (DLI) Scheme:** Incentives up to 50% of eligible R&D costs to support fabless

startups.

- **Chips to Startup (C2S):** Training 85,000 engineers and free access to EDA tools for 100+ institutions.
- **PLI Scheme for IT Hardware & Electronics:** Boosts domestic production of smartphones, laptops, servers.

Challenges:

- **Capital Intensity** – Fab setup costs $10–15 billion; sustained subsidies needed to remain competitive.
- **Talent Readiness Gap** – Only a fraction of graduates are industry-ready; specialized training must scale up.
- **Infrastructure Deficit** – Stable power, ultra-pure water, and logistics are prerequisites for fabs.
- **Venture Capital Constraints** – Semiconductor start-ups face long gestation periods, scaring off investors.
- **Policy Predictability** – Sudden tariff/licensing changes can deter foreign investors.

Way Forward:

- **Focus on Legacy Nodes** – Target 28 nm and above chips for auto, IoT, and energy sectors where demand is robust.
- **Strengthen R&D Funding** – Raise national R&D spend from 0.7% to 1.5% of GDP for innovation depth.
- **Risk-Sharing Model** – Encourage PPP models where government de-risks early capex but allows market discipline.
- **Cluster Development** – Build semiconductor ecosystems near universities and industrial corridors.
- **Global Partnerships** – Deepen India-US semiconductor MoU and collaborate with Japan, Taiwan, EU for tech transfer.

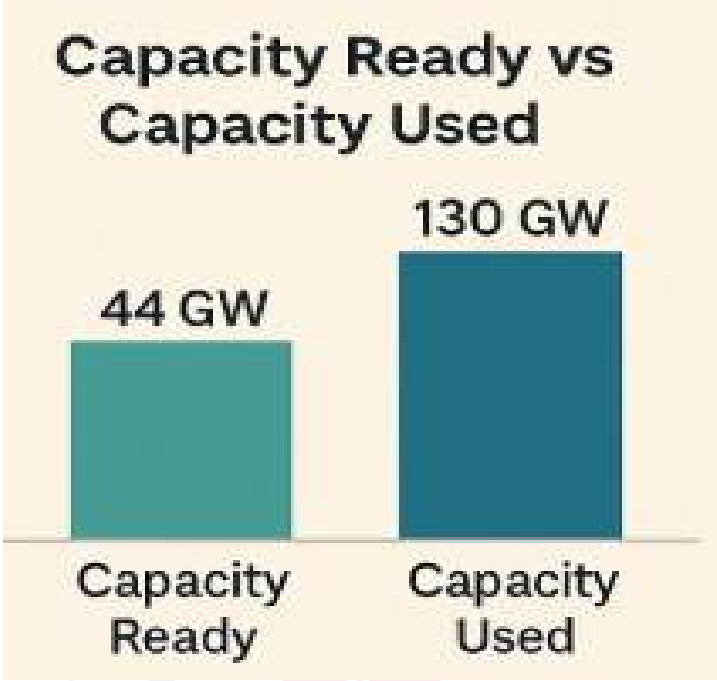
Conclusion:

Semiconductors are the "commanding heights" of the digital economy. India's design edge, vast market, and policy push offer a historic opportunity. But success hinges on execution, stable policies, and ecosystem depth. India must aim beyond assembly — to become a product nation and a driver of global innovation.

INDIA GREEN ENERGY PARADOX

Context:

India faces a "green energy paradox" — despite having 44 GW of renewable energy capacity ready for deployment, demand-side weaknesses and lack of Power Purchase Agreements (PPAs) have left it stranded.



About India Green Energy Paradox:

What is the Green Energy Paradox?

The term refers to a contradiction where **renewable energy capacity is available but underutilised** due to systemic barriers. In India, while supply capacity in renewables is expanding rapidly, demand-side absorption, financial viability, and policy mechanisms lag behind.

1. **Current Status (India's Energy Coal Dependency:** Coal and lignite still contribute **~79% of domestic energy** (FY23).

Low RE Share: Excluding large hydro, renewables account for **just 3.8% of domestic Mix & Renewables):**

2. **production**.
3. **Import Dependence**: Over **85% oil and 50% gas imports** make India vulnerable.
4. **Idle Capacity**: **44 GW RE capacity** is stuck without PPAs, despite being deployment-ready.
5. **Reliability Deficit**: Power interruptions (SAIDI ~600 mins/year) far exceed regional peers (Thailand 35, Malaysia 46).

Green Energy Paradox – Two Dimensions

1. Supply-Side Readiness

- **44 GW RE projects ready**: India has built large-scale solar and wind projects, but they remain unused without Power Purchase Agreements (PPAs).
- **Falling global costs**: Solar and wind are cheaper globally, but India's tariffs remain inflated due to policy and financial barriers.
- **PLI and VGF support**: Government incentives like Production-Linked Incentive (PLI) and Viability Gap Funding (VGF) aim to cut costs and promote investment.
- **Storage-backed RE costly**: Battery-based or pumped hydro storage raises tariffs to ₹6.6–₹9/unit, making RE uncompetitive compared to coal.

2. Demand-Side Weaknesses

- **Discom reluctance**: Power distribution companies prefer long-term coal PPAs as they are cheaper and financially predictable.
- **Integration costs**: Adding variable solar and wind power strains grids, raising costs for frequency balancing and transmission upgrades.
- **Grid inflexibility**: India lacks smart meters and demand-response systems, limiting the ability to adjust loads in real time.
- **Slow electrification**: Weak adoption of EVs, electric cooking, and industrial electrification means RE demand remains suppressed.

Barriers to RE Integration:

- **Structural:**
  - **Discom finances weak**: Heavy cross-subsidies and debt make discoms unwilling to buy costlier RE power.
  - **No smart grids**: Absence of nationwide flexible grids hampers efficient integration of renewable supply.
- **Environmental:**
  - **Coal lock-in**: Long-term coal PPAs commit states to high emissions, undermining India's net-zero targets.
  - **Idle RE waste**: Non-use of green power delays emission reductions and wastes-built infrastructure.
- **Economic:**
  - **High capital costs**: Duties, GST, and expensive borrowing inflate India's solar and wind tariffs beyond global averages.
  - **Storage unviable**: Batteries and pumped hydro are still too costly without large subsidies or incentives.

Initiatives Already Taken:

- **National Solar Mission & Hybrid Policy**: Expanded solar and promoted blending of wind-solar to balance intermittency.
- **India Semiconductor Mission (ISM)**: Boosts storage and electronics ecosystem indirectly supporting RE integration.
- **PLI for batteries**: Incentivises domestic storage manufacturing to reduce costs and import dependency.
- **Renewable Purchase Obligations (RPOs)**: Legally mandate states to procure a share of power from renewables.
- **Green Open Access Rules 2022**: Allow industries to bypass discoms and buy renewable energy directly.
- **National Green Hydrogen Mission**: Promotes hydrogen as long-term storage and clean fuel, complementing RE adoption.

Way Forward – Targeted Reforms:

1. **Enhance Storage Ecosystem**
   - Scale up Viability Gap Funding for battery storage.
   - Encourage pumped hydro and indigenous battery manufacturing under PLI schemes.
2. **Accelerate Demand Electrification**
   - Promote EV adoption with charging infrastructure.
   - Push electric cooking and industrial heating to expand RE demand base.
3. **Smart Grid and Market Reforms**
   - Deploy smart meters nationwide for real-time load balancing.
   - Transition from rigid must-run rules to market-based RE dispatch.
4. **Discom Reform**
   - Financial restructuring with accountability.
   - Introduce cost-reflective tariffs and reduce political interference.
5. **Differentiated RPO Trajectories**
   - State-specific RPOs considering local grid capability and resource availability.

Conclusion:

India's renewable paradox highlights that energy transition is not just about generation capacity, but about systemic absorption and demand-side reforms. Unless grid flexibility, storage, and discom viability improve, RE will remain stranded. To meet its climate and economic goals, India must move from capacity addition to capacity utilisation, aligning green growth with affordability, reliability, and security.

Topics: Science and Technology- developments and their applications and effects in everyday life Achievements of Indians in science & technology; indigenization of technology and developing new technology.

ARTIFICIAL INTELLIGENCE AND INDIA'S GLOBAL RACE

Context:

India's growing role in the global AI race was discussed on *Surrokar* (Sansad TV), highlighting opportunities in healthcare, education, agriculture, and finance, alongside challenges of regulation, research, and ethics.

About Artificial Intelligence and India's Global Race:

India's Position in the Global AI Race:

- **Government Push:** The India AI Mission with a ₹10,372 crore budget aims to foster infrastructure, compute power, and research.
- **Digital Strength:** Over 1 billion smartphone users and 20 billion UPI transactions monthly make India one of the most digitally connected nations.
- **Global Comparison:** China invested $30 billion and the US $20 billion in AI in 2024, highlighting India's relative funding gap.
- **Talent Pool:** With 18 million software engineers and AI in school curricula, India has scale but lags in depth of research.

Opportunities of AI for India:

- **Healthcare:**
  - AI-assisted diagnostics for cancer and rural telemedicine.
  - Predictive models for epidemics and personalised treatment.
- **Education:**
  - Real-time translation in Parliament and classrooms (Bhashini project).
  - Ed-tech platforms using AI for personalised learning in local dialects.
- **Agriculture:**
  - Precision farming and weather-based advisory systems.
  - Drought and disaster prediction for farmers.
- **Financial Inclusion:**
  - UPI-integrated AI for rural banking ("Hello UPI").
  - Fraud detection and credit scoring for underserved populations.
- **Disaster Management:**
  - Odisha's cyclone prediction models.
  - AI-enabled geospatial mapping for flood and forest management.

Challenges in India's AI Ecosystem:

- **Infrastructure Gap:**
  - Delayed availability of GPUs and slow growth of data centres.
  - Lack of world-class supercomputing facilities at scale.
- **R&D and Innovation Deficit:**
  - India contributes only 1.4% of global AI research papers.
  - Less than 2% of global AI PhDs are from India.
- **Regulation and Ethics:**
  - Outdated IT Act (2000) still governs digital space.
  - Concerns over privacy, accountability, and mental health risks from chatbots.
- **Talent Bottlenecks:**
  - Certificate courses produce surface-level skills.
  - Shortage of high-quality AI researchers and professors to train future leaders.
- **Geopolitical Competition:**
  - US, EU, and China already racing ahead with LLMs.
  - India risks being a "market for AI" rather than a creator.

Way Forward:

- **Strengthen R&D Ecosystem:**
  - Increase funding for fundamental AI research.
  - Incentivise private sector and start-ups to invest in innovation.
- **Build Human Capital:**
  - Scale AI training beyond IITs and top universities.
  - Train teachers and professors for deeper expertise.
- **Policy and Regulation:**
  - Enact a **Digital India Act** and AI-specific framework, balancing innovation and safeguards.
  - Adopt an India-specific ethical charter, drawing lessons from the EU AI Act.
- **Public-Private Partnerships:**
  - Encourage collaborations between government, academia, and industry.
  - Create AI innovation hubs for healthcare, agriculture, and sustainability.
- **Global Engagement:**
  - Collaborate with projects like **ITER (fusion)**, **EAST (China)**, and **STEP (UK)** in AI contexts.
  - Position India as a responsible AI power through the G20 and BRICS.

Conclusion:

India's AI journey offers vast opportunities but faces systemic gaps. It can transform healthcare, education, and finance, yet without regulation and innovation depth, India risks being only a consumer. Balancing ambition with ethics is key for India to lead the AI-driven digital century.

Topics: Awareness in space.

PROTECTING INDIA'S SATELLITES

Context:

India approved a ₹27,000-crore programme to launch 52 surveillance satellites from 2026.

- Reports suggest India is also considering "bodyguard satellites" to protect its space assets after near-miss incidents.

About Protecting India's Satellites:

Need for Protecting India's Satellites

- **Vital role** – Satellites are the backbone for communication, navigation (NavIC), weather forecasts, internet, defence and surveillance, making them critical for national security and economy.
- **Multiple threats** – They face risks from space debris, collisions, hostile manoeuvres, jamming, spoofing, cyber intrusions, and solar storms that can disrupt services or destroy satellites.
- **High costs** – Launching and maintaining satellites involves billions; protecting them ensures return on investment and safeguards India's strategic autonomy.

Initiatives Taken:

- **IS4OM Centre (Bengaluru)** – Tracks Indian satellites and issues timely alerts for possible collisions, enabling manoeuvres to prevent accidents.
- **Project NETRA** – Expanding India's space surveillance with radars and telescopes to build indigenous space situational awareness capabilities.
- **Aditya-L1 Mission** – Observes the sun to forecast solar storms and coronal mass ejections that could damage satellites' electronics and shorten orbital lifespans.
- **CERT-In Guidelines (2025)** – Mandate strong encryption, network segmentation, and cyber hygiene protocols to safeguard satellites from hacking attempts.
- **IN-SPACe Licensing** – Ensures private space firms adopt safety standards so that commercialisation of space remains secure and reliable.
- **Debris-Free Space Mission by 2030** – India's pledge to avoid space debris creation and adopt sustainable practices announced at IADC 2024.

Bodyguard Satellites

- **What is?**
  - Special satellites designed to escort and shield India's high-value orbital assets from external threats.
  - **Monitor close approaches** – They can detect when foreign satellites or debris move dangerously close to Indian spacecraft.
  - **Warn against manoeuvres** – Capable of identifying suspicious activities such as shadowing or hostile proximity operations.
  - **Physical intervention** – May reposition themselves or the protected satellite to prevent collisions or jamming.
  - **Global alignment** – Reflects global defence trends where major powers are developing proximity and protection satellites.

Challenges:

- **Technological** – Requires advanced sensors, AI-based autonomy, and precision manoeuvring not yet fully mastered by India.
- **Financial** – Developing and deploying escort satellites involves high costs, demanding sustained budgetary commitment.
- **Cybersecurity** – Ground stations and user terminals remain weak links vulnerable to hacking or spoofing attacks.
- **Geopolitical** – Deployment of defensive satellites may trigger mistrust or arms race in outer space among global powers.
- **Sustainability** – Protecting satellites must not worsen the problem of orbital debris or overcrowding in space.

Way Ahead:

- **Indigenous SSA tech** – Invest in LiDAR-based and radar satellites to strengthen India's ability to track debris and hostile movements.
- **Anti-jamming systems** – Develop encrypted signals, hardened waveforms, and autonomous avoidance technologies for resilience.
- **Public–Private partnerships** – Leverage start-ups and private industry to innovate low-cost solutions for satellite safety.
- **Global engagement** – Actively participate in

COPUOS, IADC and multilateral platforms to promote responsible space behaviour.

- **Defensive-first strategy** – Focus on sustainable, non-weaponised measures that ensure security without escalating conflict.

Conclusion:

Protecting satellites is no longer optional but a **strategic imperative** for India's security and economy. A layered defence of technology**, governance, and diplomacy** is essential. With careful planning, India can secure its orbital assets while championing **peaceful, sustainable use of space**.

Topics: Conservation related issues, environmental pollution and degradation, environmental impact assessment.

COOLING RIGHTS IN A SWELTERING SOUTH

Context:

In June 2025, GoI mandated all new ACs to operate between 20°C–28°C (default 24°C) to save energy and cut emissions.

- The debate has reignited over universal access to cooling as a public health safeguard and a climate adaptation necessity for India and the Global South.

About Cooling Rights in a Sweltering South:

What is Cooling?

- **Cooling** refers to the reduction of heat load in an environment to provide **thermal comfort, protect health, and preserve essential systems**.
- It is no longer limited to **luxury or comfort**; it has become a **climate adaptation tool**.
- **Characteristics of cooling**:
  1. **Protective:** reduces heat-related morbidity and mortality.
  2. **Enabling:** ensures productivity in labour-intensive sectors (agriculture, construction).
  3. **Supportive:** critical for healthcare (neonatal care, vaccine storage).
  4. **Inequitable:** access concentrated in rich urban households; poor & rural left vulnerable.
  5. **Energy-intensive:** rising demand risks higher emissions unless integrated with renewables.

The imperative of cooling access:

- **Climate-linked mortality**: WHO estimates ~4.9 lakh deaths globally (2000–2019) due to heat; India alone reported **20,000+ heat-related deaths**.

  Eg: 2022 Ahmedabad heatwave saw dozens of deaths, prompting city-level Heat Action Plans.
- **Labour vulnerability**: Nearly **80% of India's workforce** is in agriculture, construction, and informal sectors—highly exposed to outdoor heat stress.

  Eg: Rising incidences of heatstroke among construction workers in Delhi and street vendors in Hyderabad.
- **Healthcare fragility:** In South Asia, **12% of health centres lack electricity**; in Sub-Saharan Africa, only 50% of hospitals have reliable power.
  - Neonatal care, emergency surgeries, and vaccine storage depend on stable cooling.
- **Equity gap:** In India, AC ownership averages just **5%** (2021): 13% in urban, 1% in rural; richest 10% own 72% of all ACs.
  - In contrast, **90% households in US & Japan** have AC access.
- **Energy challenge:** GoI's 2025 proposal—ACs to run at **20–28°C (default 24°C)** → estimated saving: **20 billion units, ₹10,000 crore, 16 MT CO_2**. But efficiency measures alone don't address inequity.

Global North vs Global South paradox:

- **North:** Rapid AC adoption seen as legitimate "adaptation" (e.g., Europe doubling AC ownership since 1990 after heatwaves).
- **South:** Rising demand framed as a "mitigation burden" threatening global emissions targets.
- This asymmetry reveals **climate hypocrisy** and highlights the need for **development justice**.

Policy landscape in India:

- **India Cooling Action Plan (ICAP), 2019**:
  - Aims to reduce cooling demand by **20–25% by 2037–38**.
  - Promotes energy efficiency, building codes, cold-chain expansion, and R&D in green refrigerants.
- **Heat Action Plans (HAPs)**:
  - Initiated in **Ahmedabad (2013)**, now adopted by 23 states.

- Focus on early warnings, cooling centres, awareness drives.
- Weakness: poor funding, lack of enforcement, limited reach in rural belts.

- **BEE regulations:** Default AC setting at 24°C, star-labelling for efficiency.
- **International cooperation:**
  - Kigali Amendment (2016) under Montreal Protocol → phasedown of HFCs.
  - India committed to cutting HFC use by **85% by 2047**.

Key challenges:

- **Affordability barrier**: ACs remain a luxury good for most households.
- **Energy poverty**: Per capita electricity consumption in India far below global average (1,327 kWh vs US's 12,000 kWh).
- **Infrastructure deficits:** Heat shelters, green public spaces, and passive cooling designs are limited.
- **Climate trade-off:** Rising AC demand could worsen emissions unless powered by renewables.
- **Regulatory gaps**: Weak implementation of HAPs and absence of universal cooling rights.

Way forward:

- **Universal cooling as a right:**
  - Recognise cooling as a **public health right**, similar to food and water.
  - Build **climate-resilient housing** with passive cooling (ventilation, reflective rooftops).
- **Public infrastructure:**
  - Expand **heat shelters**, shaded walkways, and **community cooling centres**.
  - Prioritise cooling access in **schools, anganwadis, hospitals**.
- **Labour protection:**
  - Heat-index based **work-rest cycles**, hydration facilities, and mandatory shaded rest areas.
  - **Eg:** Telangana's rule mandating mid-day breaks for construction workers during peak summer.
- **Technology & innovation:**
  - Promote **low-cost, energy-efficient ACs** with green refrigerants.
  - Expand **district cooling systems** in urban centres (already piloted in Amaravati, Gujarat International Finance Tec-City).
- **Global cooperation:**
  - Push for **finance & technology transfer** under UNFCCC frameworks.
  - Climate finance should include **adaptation aid for cooling infrastructure**.

Conclusion:

As the global South enters an era of unprecedented heat stress, cooling must shift from a privilege of the few to a developmental right for all. India's future lies in balancing equitable access with energy efficiency, embedding cooling into health, housing, and labour policies, and demanding climate justice from the North.

SINGLE-USE PLASTIC BAN

Context:

Despite a 2016 ban under the Environment (Protection) Act, 1986, Karnataka continues to witness widespread use of single-use plastic (SUP) due to poor enforcement, illegal manufacturing, and weak civic participation.

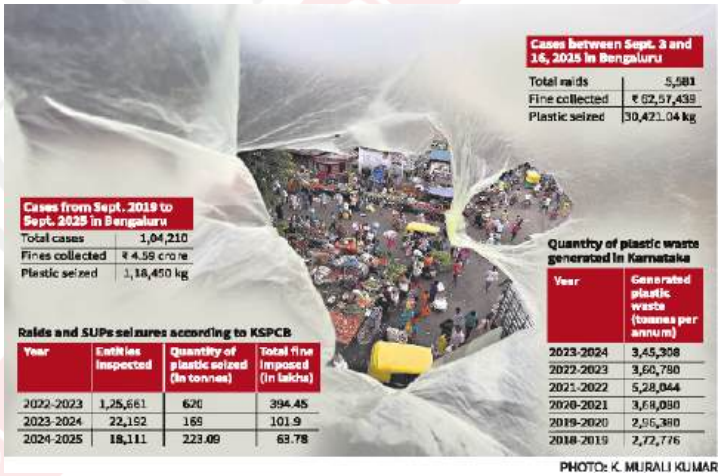


PHOTO: K. MURALI KUMAR

About Single-use plastic ban:

Background & Context

- **First-Mover Advantage:** Karnataka was India's first state to ban SUP in 2016.
- **National Ban:** The Union Government banned 19 categories of SUPs in 2022, including carry bags, thermocol, straws, cutlery, and banners.
- **Persistent Challenge:** Inspections of 1.65 lakh establishments (2021–2024) seized 1,012 tonnes of banned plastic — but enforcement intensity dropped sharply in subsequent years.

Data & Trends:

- **Plastic Waste Generation:** Karnataka produces 3.45–5.28 lakh tonnes annually (~1,000 tonnes/day).
- **Bengaluru's Burden:** 500 tonnes of SUP generated daily; only 40% is processed, rest ends up in landfills or water bodies.
- **Illegal Units:** 300+ unregistered plastic producers operate in Bengaluru, using cheap granules and additives for high-profit margins (₹50–80/kg cost, sold at ₹300/kg).

Environmental & Health Hazards:

- **Microplastics in Food Chain:** Plastics degrade into particles <5mm, infiltrating soil, crops, and water, eventually reaching humans.
- **Human Health Risks:** Linked to inflammation, endocrine disruption, respiratory issues, hypothyroidism.
- **Ecosystem Damage:** Microplastics disrupt microbial ecosystems, impacting soil fertility and aquatic life.
- **Animal Harm:** Urban cattle, stray dogs ingest plastic, leading to fatal blockages and organ damage.
- **Ocean Pollution:** UN estimates 2,000 truckloads of plastic enter oceans daily — contributing to the Great Pacific Garbage Patch.

Policy & Legal Framework:

- **Environment (Protection) Act, 1986:** Enables bans on hazardous substances.
- **Plastic Waste Management Rules, 2016 & Amendments:** Mandate Extended Producer Responsibility (EPR) for producers, importers, brand owners.
- **EPR Portal:** Tracks compliance, but enforcement remains weak — only 129 registered recyclers vs 1,200+ producers/importers.

Challenges in Implementation:

- **Enforcement Gaps:** Raids dropped from 1.25 lakh (2022–23) to 18,000 (2024–25) due to shortage of field staff.
- **Shadow Economy:** Illegal units thrive in Peenya, Dasarahalli, SP Road — easy availability of raw materials fuels production.
- **Consumer Behaviour:** Public unaware or indifferent; demand driven by cheapness and convenience.
- **Recycling Infrastructure:** Installed capacity under-utilised; segregation of waste remains poor.
- **Policy–Practice Gap:** Focus on punitive action, not systemic waste segregation or circular economy incentives.

Way Forward:

- **Strengthen Enforcement:**
  - Dedicated anti-SUP task forces with GPS-enabled inspection and real-time reporting.
  - Increase manpower in KSPCB & municipal bodies; mandate monthly reporting.
- **Support Circular Economy:**
  - Incentivise alternatives (cloth, jute bags, biodegradable cutlery) through subsidies & GST concessions.
  - Strict EPR compliance with penalties for non-collection.
- **Citizen Participation:**
  - Massive awareness drives in schools, RWAs, markets.
  - Promote BYOB (Bring Your Own Bag) campaigns and reward zero-waste businesses.
- **Urban Governance Reform:**
  - Integrate waste segregation into Swachh Bharat & Smart City projects.
  - Decentralised Material Recovery Facilities (MRFs) at ward level.
- **Technology & Innovation:**
  - Use AI & IoT for waste tracking, microplastic detection, and real-time pollution alerts.
  - Fund startups working on biodegradable packaging and plastic-to-fuel innovations.

Conclusion:

The ban on SUP remains a **paper tiger** unless backed by **robust enforcement, behavioural change, and circular economy incentives**. Karnataka's experience underlines the need for a **national mission-mode approach** to tackle plastic menace — integrating law, technology, community, and markets. Sustainable alternatives must be made affordable so that India can truly achieve **Plastic-Free 2047** under the spirit of *LiFE (Lifestyle for Environment).*

GLOBAL PLASTIC POLLUTION CRISIS

Context:

Global plastic pollution is reaching alarming levels, with waste projected to triple by 2060 to 1.2 billion tonnes, posing a grave ecological threat.

About Global Plastic Pollution Crisis:

Scale of the Crisis:

- **Explosive Growth:** Global plastic production doubled between 2000–2019, touching 460 MT; this growth is driven by packaging and fast consumption.
- **Low Recycling Rate:** Only 9% of plastic is recycled, leading to massive leakage into landfills, rivers, and open dumps.
- **Marine Catastrophe:** 11 MT of plastic enters oceans annually, harming marine species and contaminating the food chain.

- **Microplastic Spread:** Plastics degrade into micro/nano particles that infiltrate air, water, soil, and even human blood and lungs.
- **Future Outlook:** Without urgent reforms, OECD projects plastic waste will nearly triple by 2060, overwhelming waste systems globally.

Grave Problems of Plastic Pollution:

- **Persistence:** Plastics take centuries to decompose, resulting in permanent accumulation in ecosystems.
- **Climate Impact:** Plastic production and burning contribute 3.4% of global GHG emissions, intensifying climate change.
- **Biodiversity Threat:** Turtles, seabirds, and fish ingest plastic, causing starvation, poisoning, and reproductive harm.
- **Human Health Risks:** Carcinogens and endocrine disruptors in plastics leach into food and water, impacting fertility and immunity.
- **Economic Burden:** Marine plastic pollution causes losses worth $13 billion yearly in fisheries, tourism, and shipping sectors.

Initiatives Taken:

- **Global Efforts:**
  - **UNEA-5 Treaty (2022):** 193 nations agreed to negotiate a binding treaty to end plastic pollution by 2024.
  - **SDG Alignment:** Plastic reduction supports SDG-12 (sustainable consumption), SDG-13 (climate action), SDG-14 (life below water).
  - **Circular Economy Push:** Global campaigns promote reuse, redesign, and recycling to reduce virgin plastic production.
- **Indian Efforts:**
  - **Plastic Waste Management Rules 2016/2022:** Bans selected single-use plastic items and enforces producer responsibility.
  - **Swachh Bharat Mission 2.0:** Focuses on 100% door-to-door waste collection, segregation, and processing.
  - **Plastic Roads:** Over 1.2 lakh km of Indian roads use waste plastic, reducing bitumen use and improving durability.

Role in Eliminating Plastic Crisis:

- **Individuals**
  - **Refuse Single-Use Plastics:** Avoid disposable bags, straws, bottles to reduce daily plastic footprint.
  - **Segregate Waste:** Separate wet and dry waste at home to enable efficient recycling and composting.
  - **Conscious Consumerism:** Choose products with eco-friendly packaging and brands with EPR compliance.
- **Society & Community:**
  - **Community Clean-ups:** Organise beach, river, and park clean-ups to remove plastic litter collectively.
  - **Plastic Banks:** Set up local collection centres offering incentives for returning plastic waste.
  - **PPP Collaboration:** Engage private recyclers and NGOs to manage local waste efficiently.
- **Governments:**
  - **Strict Legislation:** Enforce penalties for illegal production, sale, and use of banned plastics.
  - **EPR Enforcement:** Mandate companies to take back used packaging and meet recycling targets.
  - **Tax and Incentives:** Levy landfill/incineration taxes, subsidise eco-friendly packaging and R&D.

Way Ahead

- **Adopt 6Rs:** Refuse, Reduce, Reuse, Recycle, Recover, and Redesign should guide all plastic use.
- **Promote Circular Economy:** Design products that can be reused and recycled without loss of value.
- **Boost R&D:** Invest in bio-based, compostable plastics and innovative recycling technologies.
- **Decentralise Waste Management:** Empower panchayats and ULBs with funds and autonomy for waste handling.
- **Behavioural Shift:** Use media, influencers, and campaigns to make zero-plastic living aspirational.

Conclusion:

Plastic pollution is a man-made ecological disaster threatening climate, health, and biodiversity. It requires **multi-level action** — strong governance, industry responsibility, and citizen participation. A plastic-free future is essential for **environmental justice and sustainable development**.

GREAT NICOBAR ISLAND PROJECT

Context:

Government of India has cleared the Great Nicobar Island Project, an integrated development plan of strategic and economic importance in the Indian Ocean Region.

About Great Nicobar Island Project:

What it is?

- A multi-component **mega development project** to transform Great Nicobar into a **logistics, trade, and defence hub**, improving India's presence in the Indian Ocean.
- Planned with **environmental safeguards** and **tribal welfare compliance** under **EIA Notification 2006** and **Shompen Policy 2015** to ensure sustainability.

Key Components:

- **International Container Transhipment Terminal (ICTT):** With a capacity of **14.2 million TEU**, it will reduce India's reliance on Colombo/Singapore and position the island as a global shipping hub.
- **Greenfield International Airport:** Will improve air connectivity, promote tourism, and enable rapid deployment of troops and supplies in emergencies.
- **450 MVA Gas + Solar Power Plant:** Ensures uninterrupted energy supply with a mix of conventional and renewable sources for sustainable growth.
- **Integrated Township:** A planned township over **16,610 hectares** to provide housing, infrastructure, and modern amenities to residents and workers.
- **Phased Development:** Divided into **three phases (2025–47)** to spread investment, minimise ecological stress, and allow adaptive planning over two decades.

Strategic & Economic Significance:

- **Strategic Location:** Its proximity to **Malacca Strait**, a vital global shipping lane, enhances India's ability to monitor trade routes and project naval power.
- **Blue Economy Push:** Supports **Sagarmala** and **Maritime India Vision 2030** by making India a major transhipment and shipping hub in the Indo-Pacific.
- **Defence Preparedness:** Strengthens **Andaman & Nicobar Command** as India's only tri-service command, ensuring rapid response to maritime threats.
- **Trade Competitiveness:** ICTT is expected to cut transhipment costs by **$200–300 million annually**, improving India's export-import efficiency.
- **Employment & Local Growth:** Will create thousands of direct and indirect jobs, enhance skill development, and boost **eco-tourism-led livelihoods**.

Challenges:

- **Ecological Sensitivity:** Diversion of **1.82% forest land** risks impacting endemic flora, fauna, and nesting grounds of leatherback turtles.
- **Tribal Welfare:** Need to safeguard **Shompen and Nicobarese PVTGs**, ensuring no displacement and protecting cultural heritage.
- **Disaster Risk:** Nicobar lies in a **high seismic zone**; infrastructure must be tsunami- and cyclone-resilient (2004 tsunami killed 6,000+ people in A&N).
- **Logistical Complexity:** Remoteness raises costs of transport, manpower, and maintenance, requiring robust supply chain management.
- **Global Scrutiny:** Likely to face opposition from environmental groups and international watchdogs concerned about biodiversity and climate impact.

Way Forward:

- **Strengthen EIA Monitoring:** Use **real-time satellite monitoring** and third-party audits to ensure compliance with environmental safeguards.
- **Community Participation:** Engage **PVTGs in planning**, offer livelihood schemes through eco-tourism, mangrove restoration, and craft promotion.
- **Green Infrastructure:** Prioritise solar/wind energy mix, rainwater harvesting, and low-carbon building technologies to minimise emissions.
- **Climate-Resilient Planning:** Integrate **early warning systems**, cyclone shelters, and resilient construction to mitigate disaster risks.
- **Strategic Partnerships:** Collaborate with **Quad, BIMSTEC, and SAGAR vision partners** to leverage investments, logistics, and maritime security cooperation.

Conclusion:

The Great Nicobar Island Project is a balancing act of growth and conservation, combining national security, economic opportunity, and ecological stewardship. If implemented with strict compliance and local participation, it can become a model for sustainable island development and reinforce India's role in the Indo-Pacific power matrix

HIMALAYAN FRAGILITY AND UNSUSTAINABLE DEVELOPMENT

Context:

Recent floods and landslides in Punjab, Himachal Pradesh, Uttarakhand, and Kashmir have exposed the cost of rampant construction and deforestation in the Himalayas.

- Experts and the Supreme Court have warned that unregulated "development" is pushing the fragile mountains to the brink of collapse.

About Himalayan Fragility and Unsustainable Development:

What are the Himalayas?

- The **Himalayas** are the **youngest and highest fold mountains** in the world.
- They stretch for about **2,400 km** across **India, Nepal, Bhutan, China, and Pakistan**.
- Average width: **150–400 km**; Average elevation: **6,000 m+**.
- They form the **northern boundary of the Indian subcontinent** and act as a **climatic, cultural, and ecological divide**.
- Home to the world's highest peaks including **Mount Everest (8,849 m)** and **Kanchenjunga (8,586 m)**.

Formation of the Himalayas:

- **Ancient Landmasses:**
  - Around 200 million years ago, the supercontinent **Pangaea** broke up.
  - Two major landmasses relevant to the Himalayas:
    1. **Laurasia (north)** – included Eurasia.
    2. **Gondwana (south)** – included India, Africa, Australia, etc.
- **Tethys Sea:**
  - Between Laurasia and Gondwana lay a shallow sea called the **Tethys Sea**.
  - Over millions of years, **sediments from rivers** accumulated in this sea bed.
- **Indian Plate Movement:**
  - About 140 million years ago, the **Indian Plate broke away from Gondwana**.
  - It drifted northwards at a fast rate (~15 cm/year).
- **Collision with Eurasian Plate:**
  - Around 50 million years ago, the **Indian Plate collided with the Eurasian Plate**.
  - The sediments of the Tethys Sea were compressed and uplifted due to plate convergence.
- **Orogeny (Mountain Building):**
  - The collision gave rise to **fold mountains** – the **Himalayas**.
  - The process is still active: the Himalayas are **rising by ~5 mm per year** due to ongoing plate movement.

Himalayan Fragility:

- **Young Mountains** – Himalayas are geologically young and unstable, making them naturally prone to landslides and seismic activity.
- **Climate Sensitivity** – Warming rates are higher than global averages, leading to glacier melt and erratic rainfall patterns.
- **High-Energy Environment** – Steep slopes and fast-flowing rivers amplify disaster risks like floods and soil erosion.
- **Glacial Lakes** – Over **25,000 glacial lakes** increase risks of sudden glacial lake outburst floods (GLOFs).
- **Biodiversity Hotspot** – Home to unique species and ecosystems, their destruction undermines both ecology and livelihoods.

Drivers of Himalayan Degradation:

- **Unregulated Infrastructure** – Highways, tunnels, and hydro projects destabilise slopes using heavy blasting and excavation.
- **Deforestation** – Native trees like deodar, which bind the soil, are cleared for tourism and urban expansion.
- **Hydropower Expansion** – Excessive damming alters river courses and increases disaster potential.
- **Weak Impact Assessments** – Environmental Impact Assessments (EIA) are often bypassed or diluted for quick approvals.
- **Tourism Pressure** – Surging demand for hotels and roads strains land resources and accelerates ecological erosion.

Consequences of Unsustainable Development:

- **Human Loss** – Disasters like Kedarnath 2013 and Chamoli 2021 cause large-scale deaths and displacement.
- **Ecological Damage** – Soil erosion, biodiversity loss, and degradation of forests worsen long-term resilience.
- **Disaster Multiplication** – Development without safeguards converts heavy rainfall into catastrophic floods and landslides.
- **Economic Setbacks** – Infrastructure collapses, farms destroyed, and tourism disrupted reduce state revenues.
- **Social Stress** – Communities lose trust in governance when projects endanger lives without consultation.

Way Ahead:

- **Mountain-Specific Policies** – Draft distinct development models considering carrying capacity of fragile zones.
- **Strengthen EIAs** – Ensure strict, independent ecological and disaster impact assessments before approvals.
- **Promote Nature-Based Solutions** – Afforestation, slope stabilisation, and watershed management can reduce risks.
- **Community-Led Development** – Build climate literacy, eco-tourism, and empower local governance for resilience.
- **Sustainable Energy Mix** – Shift focus from hydropower dominance to solar, wind, and decentralised energy.

Conclusion:

The Himalayas are at a **tipping point** where reckless development is colliding with climate change. Sustainable models that **respect ecology, empower communities, and balance growth** are essential. Only then can these "living mountains" remain resilient for future generations.

MALDIVES & LAKSHADWEEP SEA-LEVEL RISE

Context:

A study on coral microatolls in Maldives shows sea levels in the central Indian Ocean have been rising since the late 1950s.

About Maldives & Lakshadweep Sea-Level Rise:

Data Highlights:

- Sea level rose by **~0.3 m from 1930–2019**, proving long-term acceleration.
- Rise rates: **1–1.8 mm/yr (1930–59), 2.7–4.1 mm/yr (1960–92), 3.9–4.8 mm/yr (1990–2019)**.
- Since 1959, average rise has been **3.2 mm/yr**, climbing to **~4 mm/yr** in the last 20–30 years.
- Over 50 years, Maldives–Lakshadweep region has faced a **30–40 cm increase in sea level**.

Key Findings:

- Sea-level acceleration **began in the 1950s**, not the 1990s as widely believed.
- **Coral growth bands and uranium dating** gave precise long-term records of sea levels.
- Coral interruptions linked to **El Niño, IOD events, and lunar cycles** affecting tides.
- Central Indian Ocean showed **earlier and faster rise than coastal areas** due to unique regional factors.

Causes of Sea-Level Rise:

- **Thermal expansion:** As oceans absorb heat, seawater expands, adding volume and steadily raising global sea levels.
- **Glacial and ice-sheet melting:** Melting from the Himalayas, Arctic, and Antarctica releases vast freshwater directly into oceans.
- **Indian Ocean warming:** Above-average heating here intensifies currents and circulation, causing higher local sea-level rise.
- **Climate variability:** Events like **El Niño, Indian Ocean Dipole, and wind shifts** amplify regional sea-level fluctuations.

Implications:

- **Ecological:** Rising seas reduce sunlight for corals, cause bleaching, erode coasts, and disrupt fragile reef ecosystems.
- **Social:** Communities on low-lying islands like Maldives and Lakshadweep risk **forced migration and loss of homes**.
- **Economic:** Fisheries, tourism, and infrastructure — the lifeline of island economies — face massive long-term losses.
- **Geopolitical:** Displacement may lead to **climate refugees**, straining governance and regional security frameworks.

Way Forward:

- **Monitoring:** Use coral microatolls with tide gauges and satellites to create long-term, precise sea-level datasets.
- **Coastal resilience:** Restore mangroves, build seawalls, and adopt climate-resilient infrastructure for shoreline protection.
- **Regional cooperation:** Indian Ocean Rim nations must share data and coordinate adaptation strategies collectively.
- **Global climate action:** Meet Paris Agreement targets to cut emissions and slow ocean warming.
- **For India:** Prioritise Lakshadweep by conserving ecosystems, preparing for disasters, and investing in adaptation.

Conclusion:

Sea-level rise in the Indian Ocean is earlier and sharper than assumed, endangering islands and coastal lives. Coral microatolls provide vital historical evidence for improving future projections. Urgent steps in adaptation, cooperation, and emission reduction are critical to safeguard the region.

Topics: Disaster and management.

STAMPEDES IN INDIA

Context:

The recent **Karur stampede** at a political rally in Tamil Nadu, where actor-turned-politician Vijay's meeting led to tragic deaths, once again highlighted India's vulnerability to stampede disasters.

About Stampedes in India:

Constitutional and Legal Dimensions

- **Article 21 (Right to Life):** State's responsibility to ensure citizen safety in mass gatherings.
- **Disaster Management Act, 2005:** Stampedes fall under "man-made disasters," requiring preventive and mitigation strategies.
- **Supreme Court in *Destruction of Public & Private Properties v. State of A.P. (2009):*** directed authorities to ensure accountability in handling mass events.

Causes of Stampedes in India:

1. **Overcrowding beyond capacity:**
   - Inadequate planning for expected turnout in religious, political, and sports events.
   - **Eg:** Kumbh Mela stampede, Prayagraj (2013).
2. **Trigger events leading to panic:**
   - Sudden fall, rumours, or collapse of structures cause crowd surges.
   - **Eg:** Karur rally (2025) – fall of people from tree onto crowd.
3. **Poor infrastructure & bottlenecks:**
   - Narrow entry/exit points, weak barricading, absence of crowd dispersal routes.
   - **Eg:** New Delhi Railway Station FOB stampede (Feb 2025).
4. **Administrative lapses:**
   - Lack of early warning systems, poor coordination between police, organisers, and civic agencies.
   - **Eg:** RCB IPL victory parade in Bengaluru (2025).
5. **Sociocultural factors:**
   - India's large-scale pilgrimages, religious yatras, and political rallies often involve emotions, making crowds harder to regulate.

Consequences of Stampedes:

- **Human cost:** Stampedes cause large-scale deaths, crush injuries, and psychological trauma, leaving families devastated and survivors scarred for life.
- **Governance deficit:** Frequent tragedies expose weak administrative foresight, eroding citizen confidence in the State's capacity to ensure safety in public gatherings.
- **Economic burden:** Rescue, rehabilitation, medical care, and compensation packages impose significant financial strain on already stretched government resources.
- **International image:** Repeated crowd disasters portray India as poorly prepared for mass events, undermining its global reputation as a responsible emerging power.

Comparative Global Perspective:

- **South Korea Halloween Stampede (2022)** and **Germany Love Parade (2010)** caused global shock but led to systemic reforms.
- In India, **recurrence is frequent**, reflecting weak institutional learning.

Challenges in Prevention:

- **Event scale & unpredictability:** Religious congregations, political rallies, or sporting victories often attract unmanageable crowds, making precise control nearly impossible.
- **Low compliance with safety norms:** NDMA's 2014 guidelines on crowd flow, barricading, and exit routes are rarely implemented rigorously by local authorities.
- **Coordination gaps:** Fragmented responsibilities among police, civic agencies, and organisers result in poor planning and delayed emergency responses.
- **Limited use of technology:** Tools like AI-based crowd analytics, drone surveillance, and real-time monitoring remain underutilised in managing dense gatherings.
- **Public behaviour:** People often ignore advisories, rush towards focal points, or panic on rumours, triggering surges that lead to catastrophic crushes.

Way Forward:

- **Scientific crowd management:**
  - Use of **AI-based predictive modelling**, sensors, and drone surveillance to monitor density.
  - Deployment of **dedicated Crowd Management Units** under state police.
- **Infrastructure redesign:**
  - Wider entry/exit routes, crash barriers, overhead monitoring, and dedicated evacuation corridors.
- **Strict accountability framework:**
  - Penal provisions under Disaster Management Act for negligent organisers.
  - Real-time audits of event preparedness.

- **Community awareness:**
  - Mass awareness campaigns on **safety protocols during large gatherings**.
  - Training of volunteers in **first aid and evacuation drills**.
- **Technology integration:**
  - Use of **mobile apps for crowd alerts**, geo-fencing, and SMS-based advisories.
  - **Eg:** Kumbh Mela (2019) successfully used GIS mapping for crowd dispersal.
- **Learning from best practices:**
  - Adoption of **"one-way flow" crowd design** used at Hajj in Saudi Arabia.
  - Use of **real-time digital ticketing** for sports/ cultural events to avoid oversubscription.

Conclusion:

Stampedes are preventable tragedies arising from poor planning, weak administration, and crowd behaviour. With mass gatherings integral to India's socio-political life, proactive and tech-driven crowd management is essential. As India moves towards Viksit Bharat 2047, protecting lives must be a core aspect of right to life and good governance.

TECHNOLOGY-DRIVEN DISASTER MANAGEMENT STRATEGY

Context:

2025 Himalayan floods in J&K, Himachal, Punjab, and Uttarakhand caused heavy loss of life and property, exposing disaster preparedness gaps.

- Experts urge a technology-driven disaster management approach for a future-ready Himalayan strategy.

About Technology-Driven Disaster Management Strategy:

Himalayan Disaster Profile:

- **Geologically Fragile:** Himalayas are young fold mountains, still rising, making them prone to earthquakes, landslides, and slope instability.
- **Hydro-Meteorological Hazards:** Frequent cloudbursts, flash floods, and glacial lake outburst floods (GLOFs) occur during monsoon due to steep slopes and heavy rainfall.
- **Anthropogenic Stress:** Road widening, tunneling for hydropower, deforestation, and unregulated tourism further destabilise fragile slopes.
- **Climate Change Multiplier:** Rising temperatures intensify rainfall variability, melting glaciers faster, increasing frequency of floods and landslides.
- **High Exposure:** Pilgrimage routes and towns on river floodplains and unstable hillsides put large populations and critical infrastructure at risk.

Current Disaster Management Strength:

- **Institutional Setup:** NDMA at national level and SDMAs, NDRF, SDRFs in states provide a structured, multi-tier disaster management mechanism.
- **Rapid Response:** Army, Air Force, and BRO quickly deploy rescue teams, helicopters, and bridges to restore connectivity and save lives.
- **Technology Use:** Drones, Doppler radars, IMD's nowcasting, and satellite links help in real-time monitoring and quick dissemination of alerts.
- **Inter-Agency Coordination:** Civil administration, armed forces, paramilitary, and disaster forces conduct joint operations ensuring efficiency.
- **Community Participation:** Local volunteers, panchayats, and NGOs help in evacuation, relief distribution, and first response before formal teams arrive.

Gaps & Challenges:

- **Predictive Weakness:** Current forecasting cannot provide hyper-local warnings for cloudbursts or GLOFs with high accuracy, reducing lead time.

- **Infrastructure Stress:** Unplanned construction, road cutting, and encroachments increase hazard exposure and amplify disaster impacts.
- **Public Awareness Deficit:** Many people ignore SMS alerts or do not know evacuation routes, leading to preventable casualties.
- **Institutional Limitations:** State Disaster Management Authorities often lack trained manpower, updated plans, and adequate funding.
- **Post-Disaster Recovery Issues:** Roads and bridges are rebuilt without slope stabilisation, and compensation delays prolong rehabilitation.

Role of Technology in Reducing Disasters:

- **GIS & Remote Sensing:** Map hazard-prone areas to guide land-use planning, zoning, and infrastructure development.
- **AI-Based Forecasting:** Use machine learning to analyse rainfall patterns and predict flash floods or debris flow events in advance.
- **24×7 Monitoring:** Install continuous sensors for glacial lakes, soil moisture, and Doppler radar to give early warnings of slope failure.
- **Drone Surveillance:** Monitor vulnerable slopes, deliver supplies, and provide live imagery for decision-makers during disasters.
- **Digital Communication:** Mass alerts through mobile apps, SMS, sirens, and public announcement systems ensure timely evacuation.

Community & Governance Role:

- **Aapda Mitra Training:** Build a trained pool of community volunteers who act as first responders in villages and towns.
- **Strict Regulation:** Enforce construction bans in ecologically sensitive areas and ensure compliance with seismic and safety codes.
- **Mock Drills:** Conduct regular drills on pilgrim routes and schools to familiarise people with evacuation procedures.
- **Decentralised Plans:** Strengthen District Disaster Management Authorities with resources and autonomy for localised action.

Way Ahead:

- **Preventive Focus:** Integrate hazard mapping into urban planning, hydropower projects, and tourism development to avoid high-risk zones.
- **Tech Upgrade:** Adopt IoT-based sensors, AI prediction models, and blockchain-enabled transparent relief tracking systems.
- **Climate-Resilient Infrastructure:** Build bio-engineered retaining walls, climate-proof roads, and slope stabilisation structures.
- **Capacity Building:** Train disaster professionals, allocate dedicated funds to SDMAs, and promote local disaster literacy.
- **Public Engagement:** Make disaster preparedness part of civic education and encourage citizens to treat readiness as a duty.

Conclusion:

The Himalayan floods of 2025 are a **wake-up call**. Disaster management must move from **reactive relief to proactive risk reduction**, powered by technology and local participation. A **resilient, tech-enabled, citizen-aware system** is key to safeguarding lives and livelihoods in India's fragile mountain ecosystems.

GENERAL STUDIES – 4

CORRUPTION IN INDIA

Context:

The Rajasthan High Court recently scrapped the SI Recruitment-2021 exam due to a paper leak scam, granting bail to 23 accused. Meanwhile, RPSC member Dr. Manju Sharma resigned, citing concerns for transparency and integrity in public life.

About Corruption in India:

Definition:

Corruption is the **abuse of entrusted power for private gain**, violating the ethical foundations of probity, transparency, and accountability. It represents a breach of **deontological duty**, undermines **virtue ethics** (honesty, integrity), and erodes **social contract obligations** between state and citizens.

Types of Corruption (2nd ARC)

- **Petty Corruption**: Small-scale bribes for routine services (licenses, certificates), reflecting erosion of day-to-day integrity.
- **Grand Corruption**: High-level scams in recruitment, contracts, or natural resources that distort governance at a systemic level.
- **Collusive Corruption** – deep networks between politicians, officials, and businesses.

Causes of Corruption:

- **Administrative Lapses**: Discretion without accountability and weak oversight allow officials to misuse power.
- **Economic Factors**: Inadequate pay and rent-seeking incentives push officials toward corrupt practices.
- **Political Culture**: Criminalisation of politics and patronage networks normalise corrupt behaviour.
- **Social Norms**: Acceptance of "chai-paani" erodes ethical standards and legitimises bribery.
- **Legal-Institutional Weaknesses**: Delayed justice and fragile whistleblower protection embolden corrupt actors.
- **Psychological Causes**: As William James explains, moral indifference and rationalisation make corruption socially tolerable.

Implications of Corruption:

- **On Individuals**
  - **Loss of Meritocracy**: Honest candidates lose opportunities, eroding fairness in public life.
  - **Ethical Dissonance**: Public servants face conflicts between duty and self-interest.
  - **Victimisation**: The poor and vulnerable are denied entitlements, reinforcing inequality.
- **On Society**
  - **Trust Deficit**: Corruption erodes faith in institutions and social contract.
  - **Deepened Inequality**: Benefits flow to elites while marginalised groups remain excluded.
  - **Economic Loss**: Leakage of welfare funds and reduced investment stunt development.
  - **Democratic Weakening**: Corruption delegitimises governance, fuelling cynicism and apathy.

Challenges in Countering Corruption:

- **Institutional Capture**: Vigilance bodies lack autonomy and are vulnerable to political interference.
- **Collusion Nexus**: Politicians, bureaucrats, and business actors form entrenched unethical alliances.
- **Whistleblower Risks**: Fear of victimisation discourages reporting of corrupt practices.
- **Cultural Acceptance**: Normalisation of bribery sustains corruption as a "way of life."
- **Technology Misuse**: Digital tools meant for transparency are manipulated through leaks, proxies, and fraud.

Way Ahead:

1. **Ethical Re-orientation**
   - Value-based training for civil servants (as per **Second ARC's "Ethics in Governance"** report).
   - Infusion of **constitutional morality** and Gandhian ideals of trusteeship.
2. **Institutional Strengthening**
   - Empower Lokpal/Lokayuktas, strengthen CVC & vigilance mechanisms.
   - Ensure autonomy and transparency in recruitment bodies like RPSC/UPSC.
3. **Administrative Reforms**
   - Reduce discretion; adopt **"minimum government, maximum governance."**
   - Digital platforms to minimise human interface; use blockchain for recruitment & contracts.

4. **Social & Cultural Change**
    - Promote **citizenship ethics** – zero tolerance for corruption.
    - Strengthen role of RTI, media, and civil society.
5. **Legal-Structural Measures**
    - Fast-track courts for corruption cases.
    - Strong whistleblower protection and reward mechanisms.

Conclusion:

Corruption is not just an economic crime but an ethical failure of governance and society. To uphold probity, integrity, and accountability, India must move from compliance-based codes to value-based governance. A corruption-free state is essential for restoring trust and realising constitutional justice.

POLITICAL INTERFERENCE IN GOVERNANCE

Context:

A case has been registered against an NCP leader and others in Solapur for obstructing officials during an anti-illegal excavation drive.

- The controversy escalated after a viral video showed Deputy CM of Maharashtra rebuking IPS officer Anjana Krishna on phone, raising concerns over **political interference in governance**.

About Political Interference in Governance:

What it is?

Political interference refers to undue influence by elected representatives or party workers in the functioning of civil servants, often undermining impartiality, legality, and merit-based decision-making.

Features of Political Interference

- **Undue Pressure:** Politicians exert pressure to influence decisions—like halting raids or diluting law enforcement—compromising objectivity.
- **Patronage Networks:** Favouritism in postings, contracts, and welfare schemes ties administration to party loyalty instead of merit.
- **Erosion of Neutrality:** Civil servants become tools of ruling parties, undermining the constitutional principle of political neutrality.
- **Short-Termism:** Populist orders (like loan waivers or illegal permissions) prioritise electoral gains over sustainable governance.
- **Weak Accountability:** Blame gets diffused between ministers and officials, making it hard to fix responsibility for wrongdoing.

Ethical Issues Surrounding Political Interference:

- **Violation of Constitutional Morality:** Disregards equality before law (Art.14) and undermines rule-based governance.
- **Conflict of Interest:** Leaders face a clash between public duty and protecting party workers or private interests.
- **Erosion of Public Trust:** Citizens perceive governance as biased, weakening faith in democratic institutions.
- **Demoralisation of Civil Servants:** Honest officers face humiliation, threats, or transfers, discouraging integrity.
- **Gender & Respect Concerns:** Rebukes or disrespect, especially towards women officers, violate dignity and workplace ethics.
- **2nd ARC's Ethics in Governance notes**: "The greatest threat to probity comes from the politicisation of the civil service and erosion of neutrality."

Philosophical theories:

- **Plato – Philosopher King & Justice**
    - Plato in *The Republic* argued that rulers must be philosopher-kings, guided by wisdom and justice, not personal or partisan interests.
    - Political interference that undermines neutrality reflects the opposite—rule by passion and self-interest, which leads to injustice in governance.
- **Aristotle – Rule of Law vs. Rule of Man**
    - Aristotle emphasised *"the law should govern, not men."* Governance must be rule-based, not dependent on the whims of individuals.
    - Political interference erodes this principle, replacing laws with arbitrary dictates, weakening institutions and fairness.
- **Immanuel Kant – Duty & Moral Law**
    - Kant's *Deontological Ethics* emphasises duty and adherence to universal moral law (categorical imperative).
    - When politicians pressure civil servants for partisan gains, they violate duty to the public good, reducing governance to means for selfish ends.

- **Max Weber – Bureaucratic Neutrality**
  - Weber's theory of bureaucracy stresses *neutrality, hierarchy, and rational-legal authority* as essential for modern governance.
  - Political interference undermines Weberian neutrality, converting a professional bureaucracy into a partisan tool.

Challenges to Counter Political Interference

- **Lack of Legal Safeguards:** Absence of statutory backing leaves civil servants vulnerable to arbitrary oral orders.
- **Transfer Culture:** Frequent transfers (avg. <16 months per ARC) erode continuity and reward pliability over merit.
- **Weak Institutional Mechanisms:** Civil Services Boards lack independence, failing to shield officers from pressure.
- **Low Accountability of Politicians:** Legislators lack an enforceable code of ethics, allowing unchecked misuse of influence.
- **Culture of Silence:** Officers rarely report interference due to fear of reprisals, stalling systemic reform.

Way Ahead:

- **Fixed Tenure & Civil Services Boards:** Implement ARC recommendation for security of tenure and transparent postings.
- **Legal Backing:** Strengthen *Civil Services Conduct Rules* with statutory protection against illegal orders.
- **Code of Ethics for Politicians:** As suggested by ARC, a binding code promoting respect for constitutional values.
- **Empowered Grievance Redressal:** Independent authority to record instances of interference.
- **Training & Ethical Leadership:** Build officers' capacity in conflict resolution, ethics, and courage of conviction.
- **Strengthen Public Awareness:** Media & citizen vigilance ensure accountability and transparency.

Conclusion:

Political interference corrodes neutrality, fairness, and constitutional morality in governance. Safeguards rooted in rule of law, ARC-backed reforms, and ethical leadership are vital to protect the dignity of public service. Only when politics respects administration can democracy truly deliver justice, equity, and probity.

THE RTI'S SHIFT TO A 'RIGHT TO DENY INFORMATION'

Context:

The DPDP Act, 2023 amended Section 8(1)(j) of the RTI Act, shrinking it to a few words, allowing broad denial of information as "personal".

- Experts fear this could weaken transparency, turning RTI into a "Right to Deny Information" and shielding corruption.

About The RTI's Shift to A 'Right to Deny Information':

Right to Information (RTI) Act – Overview

- **Enacted in 2005**, RTI empowers citizens to demand information from public authorities, enforcing **Article 19(1)(a)**.
- It enables **social audits, accountability, and participatory governance**, strengthening democracy.
- **Section 8(1)(j):**
  - Earlier allowed denial only if data had **no public interest relevance** or caused **unwarranted privacy violation**.
  - **Proviso:** If info cannot be denied to Parliament/Legislature, it cannot be denied to any citizen — ensuring parity.

DPDP Act and RTI:

- The **Digital Personal Data Protection Act, 2023** seeks to regulate data privacy but overrides RTI safeguards.
- The amendment reduces Section 8(1)(j) to a vague clause, widening the scope to deny even harmless information.
- The DPDP's definition of "person" includes **individuals, firms, companies, HUFs, associations, and the State**, making nearly all information fall under "personal data".
- With **₹250 crore penalties** for data breach, PIOs may prefer blanket denial to avoid risk — eroding the right to know.

Concerns:

- **Transparency Undermined:** Most requests — like pension lists, recruitment data — may be rejected citing privacy.
- **Public Interest Test Ignored:** Constitutional mandate of maximum disclosure is sidelined, making citizens prove "larger public interest".
- **Chilling Effect on PIOs:** Fear of penalties pushes

officers to reject requests rather than face legal consequences.
- **Corruption Shield:** Ghost employees, fake beneficiaries, and procurement scams may go undetected, enabling misuse of funds.
- **Democratic Regression:** Weakens the **citizen's role as watchdog**, diluting accountability mechanisms essential for democracy.

Challenges Associated:

- **Legal Ambiguity:** Conflict between privacy (Puttaswamy judgment) and transparency lacks clear balancing framework.
- **Institutional Weakness:** CIC and State Commissions suffer 30–40% vacancies, causing long pendency of appeals.
- **Digital Divide:** Rural poor may find it harder to pursue online RTI appeals, reducing inclusiveness.
- **Citizen Apathy:** Limited civil society mobilisation compared to 2005 RTI movement; weaker public pressure.
- **Political Reluctance:** Governments benefit from opacity and are unlikely to proactively restore strong RTI provisions.

Way Forward:

- **Reinstate Proviso:** Ensure citizens get same access to information as Parliamentarians to protect parity and accountability.
- **Narrow Definition:** Limit "personal information" to sensitive data only (health, family details) using proportionality principle.
- **Strengthen Institutions:** Fill vacancies in CIC/State Commissions, improve funding, set time-bound disposal norms.
- **Proactive Disclosure:** Government must publish key datasets online (beneficiary lists, tenders) reducing need for RTIs.
- **Balance Privacy & Transparency:** Apply Supreme Court's proportionality test (Puttaswamy Case) to harmonise both rights.

Conclusion:

RTI is India's most powerful anti-corruption law, empowering citizens to hold the state accountable. Weakening it through vague privacy clauses risks reversing transparency gains of two decades. Legislators, courts, and civil society must work to restore RTI's spirit as a tool of participatory democracy.

INTEGRITY IN PUBLIC OFFICE

Context:

Assam Civil Service officer **Nupur Bora** was arrested for possessing assets allegedly 400 times her known income.
- A six-month CM Vigilance Cell probe led to seizure of over **₹2 crore in cash and jewellery**, exposing a serious breach of public trust.

About Integrity in Public Office:

What it is?

Integrity in public office means **consistent adherence to moral, ethical, and legal standards** in discharging official duties. It is about aligning **public power with public interest** rather than private gain

Key Features of Integrity:

- **Probity & Honesty:** Acting with moral uprightness and refusing to accept undue advantage ensures zero tolerance for corruption.
- **Accountability:** Every decision must withstand audit, public scrutiny, and legal challenge, promoting responsible governance.
- **Impartiality:** Officials must avoid bias or conflict of interest and provide equal treatment to all citizens.
- **Transparency:** Decisions, finances, and processes must be open and easily accessible to enhance trust.
- **Rule of Law:** All actions must be consistent with the Constitution and legal provisions, ensuring fairness and justice.

Ethical Theories Underpinning Integrity:

- **Deontological Ethics:** Focuses on duty — officials must follow rules and moral obligations regardless of outcomes (Kantian philosophy).
- **Utilitarian Ethics:** Emphasizes maximizing collective welfare and minimizing harm while making decisions.
- **Virtue Ethics:** Stresses character traits like honesty, courage, and fairness as guiding principles for conduct.
- **Social Contract Theory:** Views public office as a trust — power is legitimate only when exercised in public interest.

Importance of Integrity in Public Offices:

- **Public Trust:** Builds citizen confidence in governance, ensuring higher compliance and cooperation.
- **Efficient Service Delivery:** Reduces leakages, ensures optimal use of resources, and improves welfare outcomes.
- **Economic Growth:** Clean governance lowers corruption costs and attracts domestic and foreign investment.
- **Rule of Law:** Reinforces equality before law, discouraging favoritism and patronage networks.
- **Moral Leadership:** Civil servants become role models, inspiring ethical behaviour in society.

Challenges to Integrity:

- **Weak Enforcement:** Delays in vigilance inquiries and departmental action allow unethical behaviour to continue.
- **Opaque Processes:** Lack of timely disclosure of assets or decisions creates opportunities for corruption.
- **Political Patronage:** Errant officers may be shielded through political interference or transfers.
- **Low Deterrence:** Slow trials and weak conviction rates reduce fear of punishment.
- **Organized Corruption Networks:** Nexus of officials, contractors, and middlemen institutionalizes corruption.

Role of Prevention of Corruption (Amendment) Act, 2018:

- **Wider Definition:** Expands the meaning of "undue advantage" to cover cash, gifts, favours, and non-monetary gratifications.
- **Bribe Givers Punishable:** Makes giving a bribe an offence while protecting coerced whistleblowers from prosecution.
- **Corporate Liability:** Holds companies responsible for employee bribery unless they prove adequate preventive systems.
- **Time-bound Trials:** Ensures corruption cases are concluded within two years (extendable to four), creating quick deterrence.
- **Attachment of Property:** Allows seizure and confiscation of illicit assets, depriving wrongdoers of illegal gains.

Way Ahead:

- **Strengthen Internal Vigilance:** Provide autonomy and resources to vigilance cells, Lokayuktas, and CVC for proactive investigation.
- **Digital Transparency:** Mandate online declaration of assets and create public dashboards for postings and transfers.
- **Capacity Building:** Regular ethics and integrity training to sensitize officials about probity and accountability.
- **Swift Justice:** Establish special courts for quick disposal of disproportionate asset cases and corruption trials.
- **Whistleblower Protection:** Enforce Whistleblower Protection Act effectively to encourage reporting of corruption safely.

Conclusion:

Integrity is the **soul of public service**—its absence corrodes governance from within. The Nupur Bora case is a wake-up call to tighten preventive vigilance, accelerate punitive action, and foster an ethical culture. A value-driven bureaucracy, supported by legal reforms like PCA 2018 and systemic vigilance, is essential for realizing the vision of a **corruption-free, citizen-centric state**.

FACTS FOR PRELIMS

ART AND CULTURE

Architecture

SARNATH

Context: India has officially nominated Sarnath for the UNESCO World Heritage List (2025-26 cycle), potentially ending its 27-year wait on the tentative list.

- The ASI will also install a new plaque crediting **Babu Jagat Singh** (1787-88) for bringing Sarnath's archaeological importance to light, correcting earlier attribution to the British.

About Sarnath:

What is Sarnath?

- Sarnath is one of the **four holiest Buddhist pilgrimage sites** (along with Lumbini, Bodh Gaya, Kushinagara), located ~10 km northeast of Varanasi, Uttar Pradesh.
- It is revered as the place where **Gautama Buddha delivered his first sermon (Dhammachakkappavattana Sutta)**, marking the beginning of the **Buddhist Sangha**.

Origin & Early History:

- Known as **Mrigadava/Rishipatana** in Buddhist texts.
- Its association with Buddha was solidified by **Emperor Ashoka (268–232 BCE)** who erected the famous **Lion Capital Pillar** (now India's National Emblem) and built stupas and monasteries.
- The **Dhamek Stupa** marks the spot of Buddha's sermon, while monastic remains (vihara ruins) attest to early community life.

Patronage & Flourishing Period:

- **Ashokan Era:** Patronage turned Sarnath into a major Buddhist pilgrimage centre.
- **Kushana & Gupta Dynasties (1st–6th CE):** Expanded and refurbished structures, built new monasteries, making Sarnath a thriving monastic hub.
- Survived and flourished until **12th century CE**.

Decline & Destruction:

- Sarnath was **sacked and burned** around 12th century CE.
- Some historians attribute destruction to **Qutb-ud-din Aibek's invasion (1193 CE)**, others to a **brahmanical takeover attempt** followed by Islamic raids.
- Monks fled, and the site fell into ruin for nearly **seven centuries**.

Modern Rediscovery:

- **1787-88:** Jagat Singh's workers unearthed Buddha images while digging for construction material.
- **1799:** Jonathan Duncan reported findings, triggering British interest.
- **1835-36:** Alexander Cunningham conclusively identified Sarnath as Buddha's sermon site.
- **1904-05:** Friedrich Oertel's scientific excavations yielded 476 artefacts & 41 inscriptions.

Key Features Today:

- **Dhamek Stupa** – cylindrical stone stupa marking sermon site.
- **Ashokan Pillar & Lion Capital** – now India's national emblem.
- **Archaeological Museum** – houses relics, inscriptions, sculptures (e.g., seated Buddha in Dharmachakra Mudra).

Religion and Festivals

LANKHONG PUJA

Context: The Tiwa tribe of Assam recently celebrated their traditional Lankhong Puja, a socio-religious festival where prayers are offered for a good harvest in the upcoming Rabi season.

About *Lankhong Puja:*

- **What it is?**
  - A **traditional socio-religious festival** of the Tiwa community.
- **Celebrated by:** The **Tiwa (Lalung) tribe** of Assam.
- **Reason:**

- To invoke blessings for a **prosperous Rabi crop season** and ensure good agricultural yield.

- **Features:**
  - Community members offer prayers and make ritual offerings to deities.
  - Music, dance, and other cultural performances accompany the rituals.
  - Reinforces agricultural traditions, community bonding, and cultural continuity.

About *Tiwa Tribe:*

- **Who they are?**
  - An important tribal group of Assam, formerly known as **Lalung**, belonging to the **Mongoloid ethnic group**.
  - Linguistically part of the **Tibeto-Burman family**, with close ties to Bodo-Naga tribes.
- **Habitat:**
  - Reside mainly in **Nagaon, Morigaon, Dhemaji, Dibrugarh, Jorhat, Titabor (Assam)**, as well as parts of **Meghalaya and Tripura**.
  - Settlements are divided into **hill Tiwas** and **plain Tiwas**, with distinct lifestyles influenced by geography and neighboring communities.
- **Features:**
  - **Physical:** Mongoloid features; name "Tiwa" itself denotes *Ti = water*, *Wa = superior*.
  - **Cultural:** Rich oral traditions, folk music, and dance; historical references in **Assam Buranji, Jayanta Buranji, Kachari Buranji**.
    - Religious life centers around **Borghar, Thaan Ghar, Naamghar**.
  - **Social:** Youth organizations like **Chamadi** play a key role in community service and social responsibilities. Festivals and rituals reflect agricultural cycles and collective life.

Textiles

BHADOHI'S HANDMADE CARPET INDUSTRY

Context:
Bhadohi's handmade carpet industry — contributing over 60% of India's carpet exports — is facing a severe crisis due to the U.S. imposing a 50% tariff on Indian goods, leading to order cancellations, production cuts, and job losses.

About Bhadohi's Handmade Carpet Industry:

What It Is?

- Carpet weaving is a traditional handcraft where wool, silk, or cotton threads are knotted or tufted on looms to create decorative and durable floor coverings.
- Bhadohi–Mirzapur belt in Uttar Pradesh is globally known as "**Carpet City**" and is India's largest hand-knotted carpet cluster.

History:

- Origin traced to the **Mughal era** – Ain-i-Akbari (16th century) mentions carpet production under Akbar's patronage.
- Persian weavers were invited to India, leading to Indo-Persian designs.
- Carpet weaving grew during colonial trade; post-independence, Bhadohi became a major export hub with global buyers.

Characteristics:

- **Hand-knotted Carpets:** These carpets are highly durable and known for intricate, detailed patterns, often taking 3–6 months to weave depending on size and complexity.
- **Materials:** Made using premium wool (imported from New Zealand), silk from Karnataka, and eco-friendly natural dyes, ensuring quality and sustainability.
- **Cluster-based Production:** Over 1,200 exporters and 22 lakh artisans in Bhadohi–Mirzapur form the world's largest hand-knotted carpet cluster, ensuring economies of scale.
- **Design Diversity:** Styles range from Persian and Mughal floral motifs to modern geometric patterns, catering to global aesthetic preferences.
- **Labour Intensive:** Involves multiple skilled stages — carding, spinning, dyeing, knotting, washing, shearing — creating large-scale rural employment opportunities.

Significance:

- **Economic Contribution:** Exports worth ₹17,000+ crore annually (2024–25), 58.6% to the U.S. market.
- **Employment:** Direct and indirect livelihood to over 20 lakh artisans in Uttar Pradesh and nearby states.
- **Cultural Heritage:** Preserves centuries-old weaving techniques and Mughal-era art forms.

VRINDAVANI VASTRA

Context:

The British Museum has agreed to loan the 16th-century Vrindavani Vastra to Assam in 2027 for an 18-month public exhibition.

About Vrindavani Vastra:

- **What it is?**
  - A **magnificent silk tapestry** created in the **16th century** under the guidance of saint-reformer **Srimanta Sankardeva**, central figure of Assam's Vaishnavite movement.
  - Woven as 15 panels later assembled into a textile measuring **937 cm × 231 cm**.
  - Depicts scenes from **Lord Krishna's life in Vrindavan** and other mythological motifs.
- **History:**
  - Commissioned by **Koch king Nara Narayan** in Assam.
  - Travelled to Tibet, repurposed in a monastery at Gobshi, and later acquired during the **1904 Younghusband expedition** by British journalist **Perceval Landon**.
  - Taken to London and accessioned into the **British Museum (As1905,0118.4)**, initially miscatalogued as Tibetan silk before its Assamese origin was rediscovered decades later.
- **Features:**
  - **Silk weaving with vibrant motifs**, rich in narrative art.
  - Unique as Vaishnavism under Sankardeva discouraged idol worship—yet the textile became a medium for depicting sacred stories.
  - Represents a **fusion of spirituality and artistry**, blending ritual utility with visual storytelling.
- **Significance:**
  - A **living testimony of Assamese cultural identity,** Vaishnavite Bhakti movement, and silk craftsmanship.
  - Enhances global awareness of **India's intangible and tangible heritage**, strengthening demands for repatriation of cultural artefacts.

Miscellaneous

SEVEN NATURAL HERITAGE SITES ADDED TO UNESCO'S TENTATIVE LIST

Context:

Seven new natural heritage sites from India have been added to UNESCO's Tentative List of World Heritage Sites, raising India's total to 69 properties under consideration.

About Seven Natural Heritage Sites Added to UNESCO's Tentative List:

What It Is?

- The **Tentative List** is the first step in the process of attaining **World Heritage Site status** under UNESCO.
- Inclusion signals international recognition and begins the process for future nomination and global conservation funding/support.

Aim:

- **Preserve Geological and Natural Heritage:** Highlight sites with unique ecological, geological, and scientific significance.
- **Promote Global Recognition:** Enhance India's

cultural diplomacy and soft power by showcasing natural wonders.

Sites Nominated & Key Features

1. **Deccan Traps, Maharashtra** – Among the **world's best-preserved lava flows**, located in **Koyna Wildlife Sanctuary** (also a UNESCO site).
2. **St. Mary's Island Cluster, Karnataka** – **Rare columnar basaltic rock formations** from the **Late Cretaceous period (85 mya)**.
3. **Meghalayan Age Caves, Meghalaya** – Includes **Mawmluh Cave**, the **global stratotype** for Meghalayan Age in the Holocene Epoch.
4. **Naga Hill Ophiolite, Nagaland** – Exposes **oceanic crust uplifted on land**, crucial for understanding **plate tectonics**.
5. **Erra Matti Dibbalu, Andhra Pradesh** – **Red sand dunes** with paleo-climatic evidence, showcasing **coastal geomorphology**.
6. **Natural Heritage of Tirumala Hills, Andhra Pradesh** – Home to the **Eparchaean Unconformity** (1.5 billion years old) and **Silathoranam arch**.
7. **Varkala Cliffs, Kerala** – Spectacular coastal cliffs exposing **Warkalli Formation**, with natural springs and scenic value.

Significance:

- **Strengthens India's Global Standing:** Positions India as a leader in geodiversity and nature conservation.
- **Boosts Research & Education:** Provides opportunities for geological, ecological, and climate studies.
- **Supports Eco-Tourism:** Attracts global tourists, creating jobs while maintaining ecological balance.

ERRA MATTI DIBBALU (RED SAND DUNES)

Context:

The Erra Matti Dibbalu (Red Sand Dunes) near Visakhapatnam and the Tirumala Hills in Andhra Pradesh have been included in the UNESCO Tentative List of World Natural Heritage Sites.

About Erra Matti Dibbalu (Red Sand Dunes):

- **What it is?**
  - Notified National Geo-heritage Monument located along the Bay of Bengal coast near Visakhapatnam, Andhra Pradesh.
  - Covers **~1,500 acres**, showcasing rare coastal geomorphological formations.
- **Origin & History:**
  - Formed during the **late Quaternary Age (~2.6 million years ago)**, recording climate oscillations and sea-level changes.
  - **First documented in 1886** by British geologist William King.
  - Declared a **National Geo-heritage Monument in 2016** by Geological Survey of India (GSI).
- **Key Features:**
  - Composed of **sand, silt, and clay**, with distinctive **reddish hue** caused by natural oxidation.
  - Contains **dendritic drainage patterns** and sedimentary layers acting as natural climate archives.
  - Only **two other such sites exist globally** — one in Sri Lanka and one in Tamil Nadu.
- **Significance:**
  - **Geological Importance:** Acts as a natural laboratory to study sea-level changes, monsoon evolution, and Quaternary geology.
  - **Educational & Research Value:** Crucial for paleoclimatology and coastal geomorphology research.
  - **Tourism Potential:** Can boost geotourism if managed sustainably.

AMRITSARI KULCHA

Context:

Punjab's Food Processing Department is seeking a Geographical Indication (GI) tag for the iconic Amritsari Kulcha.

About Amritsari Kulcha:

- **What It Is?**
  - A **stuffed, flaky tandoori flatbread** made with refined flour (maida), fermented with yogurt and leavening agents, baked in a clay oven.
  - Served with **chhole, tamarind chutney, pickled onions**, and topped with butter or ghee, forming a signature Punjabi breakfast dish.
- **Origin:**
  - Traces back **200 years** in Amritsar; considered an adaptation of **naan** with fillings.
  - Influences from **khameeri roti** fermentation and possibly colonial-era layering techniques gave it its distinct **flakiness**.
- **Features:**
  - **Low-temperature tandoor baking** allows slow ghee melting for signature crispiness.
  - Local ingredients, water quality, and multi-layered rolling technique add to its **unique texture and taste**.
- **State Involved:**
  - **Punjab** is spearheading the GI tag proposal through its **Food Processing Department**.
  - Amritsar, called the **"Kulcha Capital of India"**, is the main centre, with popular outlets like Kesar Da Dhaba and Bhai Kulwant Singh Kulchian Wale.
- **Issues & Significance:**
  - **Issue:** Absence of GI tag allows imitation in other states, diluting authenticity.
  - **Significance:** GI tag would safeguard culinary heritage, promote **culinary tourism**, and benefit local businesses and farmers supplying ingredients.

STATE EMBLEM OF INDIA

Context:

Nearly 50 people were detained in Srinagar after a plaque bearing the national emblem was vandalised and removed inside the Hazratbal shrine.

About State Emblem of India:

What it is?

- The **State Emblem of India** is an adaptation of the **Lion Capital of Ashoka at Sarnath**.
- Adopted officially on **26 January 1950**, the day India became a Republic.
- It symbolises India's sovereignty, authority, and values of truth and justice.

Origin:

- The original Lion Capital was erected by **Emperor Ashoka (3rd century BCE)** at Sarnath, where Buddha delivered his first sermon.
- It formed part of Ashoka's pillars, spreading the message of **Dhamma (righteousness)**.
- Discovered in 1905 and preserved at the **Sarnath Museum, Uttar Pradesh**.

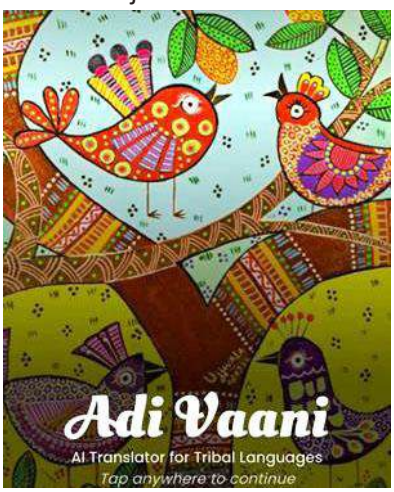
Features:

- **Four Asiatic Lions**: Standing back-to-back, symbolising **power, courage, pride, and confidence**.
- **Abacus Frieze:** Carved with high-relief sculptures of an **elephant, horse, bull, and lion**, separated by **Dharma Chakras (wheels of law)**.
- **Lotus Base:** The original had a bell-shaped lotus, omitted in the official emblem.
- **Adopted Emblem:** Shows **three lions visible**, Dharma Chakra at centre, **bull on right**, **galloping horse on left**, with outlines of wheels at the ends.
- **Motto:** *"Satyameva Jayate"* (Truth Alone Triumphs), inscribed below in **Devanagari script.**

BHIL TRIBE

Context:

A translated collection of Bhil folk tales in Hindi will soon be released as an e-booklet on the Tribal Affairs Ministry's Adi Vaani website and app, showcasing oral traditions on caste, love, theatre, and social justice.



About *Bhil Tribe:*

Who They Are?

- The Bhils are among the **oldest tribal communities in India**, belonging to the Austroloid group and often identified with the Dravidian racial stock of Western India.
- Known as skilled archers, their name derives from the Dravidian word *billu/villu* (bow).

Habitat:

- Traditionally spread across **Rajasthan, Gujarat, Madhya Pradesh, Maharashtra, and parts of Bihar**.
- Present population pockets also exist in **Tripura, Chhattisgarh, and Jharkhand**.

History:

- **Ancient references:** Associated with **Shabari in Ramayana**, linked to Eklavya in *Mahabharata*, and believed by some traditions to be descendants of Harappan settlers.
- **Medieval period:** Fought guerrilla wars against Rajputs, Mughals, and Marathas to defend ancestral lands.
- **Colonial era:** Declared a "criminal tribe" under the **Criminal Tribes Act, 1871**, subjected to bonded labour, taxation, and displacement.
- **Resistance movements:** Bhagat Movement (1883) led by Govind Guru, culminating in the **Mangarh massacre (1913)**; later the **Eki Andolan (1920)** led by Motilal Tejawat.

Features:

- **Social:**
  - Organised around village deities (*Gramdev*, *Kuldev*, *Kuldevi*).
  - Traditionally patriarchal but community-centric decision-making through elders.
  - Strong kinship bonds, with joint family traditions.
- **Cultural:**
  - Rich oral traditions of **folk tales, theatre, and dance**.
  - Festivals marked by **music (flutes, drums), drinking, and all-night dancing**.
  - Worship of local and natural deities: *Baba dev*, *Bhilat dev*, *Bag dev*, serpent gods, along with Shiva and Durga.
  - Mythology connects them to Valmiki and to Shabari's offering to Lord Rama.

About Adi Vaani:

- **What it is?**
  - A language translation application and website launched by the Government of India. It is designed to translate between various Adivasi (tribal) languages and Hindi/ English.
- **Developed by:** The **Ministry of Tribal Affairs**, Government of India. The project utilized linguistic data collected by State Tribal Research Institutes to ensure authenticity.
- **Key Features:**
  - **Bi-directional Translation:** Translates to and from Adivasi languages, Hindi, and English.
  - **Initial Language Support:** Currently supports Gondi, Bhili, Mundari, and Santali. Support for Kui and Garo is planned for a soon.
  - **Multi-Platform Access:** The app will be available for download on both **Android and Apple** app stores.
  - **Feedback Mechanism:** Includes a feature for users to provide feedback to help improve translation accuracy over time.
  - **Cost-Effective:** Developed as a "frugal innovation" at a fraction of the cost of commercial platforms.

ANCIENT HISTORY

Indus Valley Civilization

SARCOPHAGUS

Context:

The first-ever AMS radiocarbon dating of a sarcophagus from Kilnamandi (Tamil Nadu) dates it to 1692 BCE, placing it in the Late Harappan period.

- Findings suggest south-north trade links between Tamil Nadu and Harappan regions (Gujarat, Maharashtra) and push back the timeline of Tamil Nadu's graffiti tradition.

About Sarcophagus:

- **What It Is?**
  - **Sarcophagus:** A terracotta coffin used for burials, containing charcoal, pottery, and grave goods.
  - Acts as key archaeological evidence for burial practices and socio-cultural life of ancient Tamilakam.
- **Where It Was Found:**
  - **Site:** Kilnamandi village, Tiruvannamalai district, Tamil Nadu.
- **Key Features:**
  - **Date:** 1692 BCE (Late Harappan period).
  - **Grave Goods:** Etched carnelian beads (originating from Gujarat/Maharashtra), iron tools, pottery.
  - **Graffiti Marks:** Fork-like symbols, semi-concentric 'U'-shaped circles, vertical lines with wavering lines — ~90% similarity with Indus Valley symbols.
  - **Clan Burial Indication:** Graffiti limited to certain burials suggesting clan-based identity.
  - **Associated Finds:** Iron spears (7–8 feet), collective urn burials in slab enclosures, high-tin bronze objects.
- **Significance:**
  - **Redraws Trade Map:** Confirms **south-north trade links** during the Late Harappan period.
  - **Pushes Back Graffiti Tradition:** Dates Tamil Nadu graffiti marks to 17th century BCE.
  - **Evidence of Complex Society:** Presence of iron tools, organized clan burials indicate early social stratification.

Ancient History Miscellaneous

DOLMENS OF KODAIKANAL

Context:

The dolmens of Kodaikanal, megalithic structures dating back over 5,000 years, are fast disappearing, with less than 50% of those recorded in the early 20th century still standing.

About Dolmens of Kodaikanal:

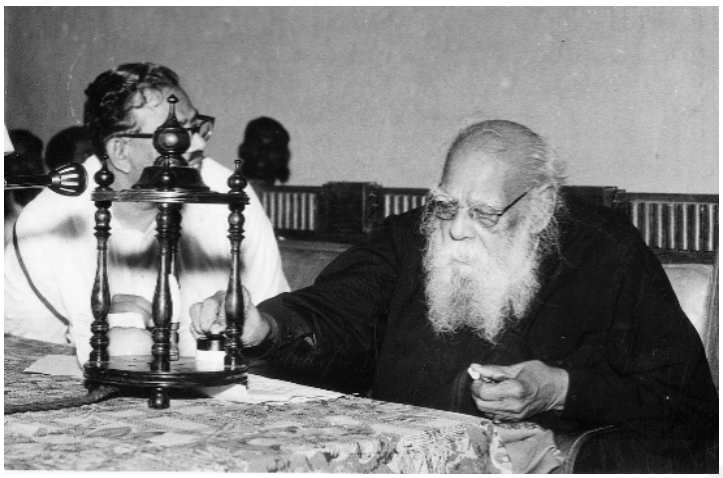
- **What it is?**
  - Dolmens are **megalithic box-like stone structures**, usually a large stone slab resting on three vertical pillars, built above the ground.
  - They often served as **burial chambers, memorials, or ritual sites**, though some local traditions suggest habitation use.
- **Origin:**
  - Constructed between **1500–2000 BCE (Pre-Iron Age)**, making them among the **oldest structures in the Palani Hills.**
  - Linked to early tribes such as the **Paliyans and Kurumbas**, who are believed to be either descendants or related to the dolmen builders.
- **History:**
  - First systematically recorded by Jesuit priests **Rev. A. Anglade S.J. and Rev. L.V. Newton S.J.** in the early 20th century.
  - Their surveys, published in the **1928 Memoirs of the Archaeological Survey of India**, noted ongoing destruction even during road construction.
  - Excavations at **Thandikudi and Pethuparai** revealed artefacts like black-and-red ware pottery and carnelian beads, proving continuous habitation from pre-Iron Age to early historic periods.
- **Features:**
  - **Simple construction:** Stones were not cut or dressed, but sourced from natural quarries.
  - **Cap-stone design:** Slight slope on top stone allowed rainwater runoff, preventing chamber flooding.
  - **Strategic placement:** Built on rocky ridges, slopes, or near large rock expanses for natural stability.
  - **Communication role:** Some circles placed within torch-signal visibility of each other.
  - **Altitude factor:** Most sites are at **4000–5000 ft above sea level**, ideal for forest produce like cardamom and pepper, explaining ancient settlement patterns.
- **Significance:**
  - **Archaeological value:** Offer insights into Pre-Iron Age society, burial practices, and early trade routes.
  - **Cultural heritage:** Locals like the Paliyans still claim ancestral connections, adding intangible heritage value.

MODERN HISTORY

Important Movements

SELF-RESPECT MOVEMENT

Context:
This year (2025) marks 100 years of the Self-Respect Movement launched in Tamil Nadu in 1925 by Periyar E.V. Ramasamy.



About Self-Respect Movement:

What it is?

- A radical **social reform movement** against caste oppression, patriarchy, and religious orthodoxy.
- Emphasised **rationalism, equality, and dignity of individuals** over ritualism and hierarchy.

Launched in:

- **1925, Tamil Nadu**, through the Tamil weekly *Kudi Arasu* (Republic).

Leaders:

- **E.V. Ramasamy (Periyar)** – founder and chief ideologue.
- Influenced by earlier reformers like **Iyothee Thass, Jyotirao Phule, and B.R. Ambedkar**.
- Supported initially by the **Justice Party**, later evolved into the **Dravidar Kazhagam**.

Aim:

- To **eradicate caste hierarchy and Brahmanical dominance**.
- Promote **self-respect, social equality, and gender justice**.
- Shift focus of reform from elite non-Brahmins to the **common masses**.

Features:

- Promotion of **self-respect marriages** (without priests, caste rituals).
- Advocacy for **women's rights**: widow remarriage, right to divorce, property rights, abortion rights.
- Encouraged **inter-caste marriages** and gender equality.
- Strong **critique of religion, superstition, and patriarchy.**
- Rejection of Congress's "religion-tinted nationalism" and Gandhian orthodoxy.
- Emphasis on **Dravidian identity and rationalist thought**.

Importance:

- Gave non-Brahmin masses a **sense of dignity and political consciousness**.
- Laid foundation for **Dravidian politics** and welfare-oriented governance in Tamil Nadu.

Important Personalities

ISHWAR CHANDRA VIDYASAGAR

Context:
Union Home Minister of India paid tribute to Ishwar Chandra Vidyasagar on his 205th birth anniversary in Kolkata.

About Ishwar Chandra Vidyasagar:

What it is?

- A **19th-century social reformer, educationist, and writer**, Vidyasagar is revered as the **"Father of Modern Bengali Prose"** and an icon of the **Bengal Renaissance.**
- Known both as *Vidyasagar* (Ocean of Knowledge) and *Dayar Sagar* (Ocean of Kindness).

Birth:

- Born on **26 September 1820** at Birsingha village in Midnapore district, Bengal Presidency.
- Early life marked by **extreme poverty**, yet he excelled in Sanskrit and English studies.

Career:

- Cleared the **Law Examination (1839)** and became **Head of Sanskrit Department** at Fort William College (1841).

- Later served as **Principal of Sanskrit College, Calcutta**, and championed access to education for non-Brahmins and women.
- Authored **Borno Porichoy (1855)**, the primary Bengali alphabet primer still used today.

Contribution to Indian Freedom Movement:

1. **Social reforms:** Led campaigns for **Hindu Widow Remarriage Act, 1856**, abolition of child marriage, and restrictions on polygamy.
2. **Women's education:** Founded several schools for girls, opening higher education to women against orthodox opposition.
3. **Cultural nationalism:** By modernising Bengali language and prose, he nurtured a **shared Bengali identity**, a precursor to nationalist awakening.
4. **Empowerment of marginalised:** Opened doors of learning to lower-caste students, breaking caste barriers in education.
5. **Grassroots work:** Spent his later life at **Karmatanr (now Jamtara, Jharkhand)** among Santhals, establishing schools, adult literacy centres, and free clinics.

Organisations Associated With:

- **Sanskrit College, Calcutta** (Principal, 1851–1858).
- **Bethune School, Calcutta** (supporter, helped in expansion of girls' education).
- **Students' Societies & Educational Initiatives** during the Bengal Renaissance.
- His work later inspired the **Brahmo Samaj's progressive reform campaigns**, continuing the legacy of Raja Ram Mohan Roy.

ACHARYA VINOBA BHAVE

Context:
Prime Minister of India paid homage to Acharya Vinoba Bhave on his birth anniversary (11 September 2025).

About Acharya Vinoba Bhave:

- **Who He Was?**
  - Revered as **National Teacher of India** and **spiritual successor of Mahatma Gandhi**.
  - Eminent philosopher, reformer, linguist, and advocate of **Sarvodaya (welfare of all)**.
  - Known as the leader who gave India the **Bhoodan (Land-Gift) Movement**.
- **Birth & Early Life:**
  - Born on **11 September 1895** at Gagode village, Maharashtra.
  - Deeply spiritual since childhood, drawn to **Bhagavad Gita** and ascetic life.
  - After reading Gandhi's speech at BHU, abandoned formal education, met Gandhi at Kochrab Ashram in 1916, and joined his ashram activities.
- **Contribution to Freedom Movement:**
  - Became **first Individual Satyagrahi** in 1940 at Gandhi's request, symbolizing truth-force at personal level.
  - Actively involved in **Quit India Movement (1942)** and Gandhian constructive programmes (Khadi, Nai Talim, village industries).
  - Lived at Sabarmati Ashram in "Vinoba Kutir" and delivered **Talks on the Gita**, later published and translated widely.
- **Social & Spiritual Contributions:**
  - **Bhoodan Movement (1951):** Collected over 4 million acres of land from landlords and distributed to landless farmers.
  - **Gramdan (1954):** Extended idea to donation of entire villages for community ownership.
  - Promoted **non-violence, self-reliance, sanitation, and rural upliftment**.
  - A polyglot and prolific writer, translated **Bhagavad Gita into Marathi (Geetai)** and commented on Bible, Quran, and Dnyaneshwari.
- **Importance & Legacy:**
  - Bridged gap between **spirituality and socio-economic reform**.
  - Inspired land reforms, rural reconstruction, and **trusteeship concept** in economy.

DR. SARVEPALLI RADHAKRISHNAN

Context:
On September 5, 2025, President Droupadi Murmu paid floral tributes to Dr. Sarvepalli Radhakrishnan at Rashtrapati Bhavan on his birth anniversary, which is also celebrated as Teacher's Day in India.

About Dr. Sarvepalli Radhakrishnan:

- **Who he was?**
  - Born on **September 5, 1888**, in Tirutani, Andhra Pradesh.
  - A renowned **philosopher, scholar, teacher, and statesman**.
  - Served as **India's second President (1962–1967)** and **first Vice President (1952–1962)**.
- **History & Academic Career:**
  - Studied at **Madras Christian College**.
  - Taught at the Universities of **Mysore and Calcutta**; later became **Spalding Professor of Eastern Religions and Ethics at Oxford University**.
  - Known for bridging **Indian and Western philosophy**, introducing Indian thought to the global stage.
  - Served as **Ambassador to the Soviet Union (1949–1952)** before entering high political office.
- **Contributions to India:**
  - Strong advocate of **education as a tool of transformation**.
  - Chaired the **University Education Commission (1949)** to reform higher education in independent India.
  - Promoted **religious pluralism and comparative philosophy**, enhancing India's intellectual profile abroad.
  - Guided India through critical years of Cold War diplomacy as Vice President and President.
- **Significance:**
  - His **birth anniversary is celebrated as Teacher's Day**, recognising his lifelong dedication to education.
  - Revered for his **wisdom, erudition, and statesmanship** in India's formative years.
  - Considered a **bridge-builder** between East and West through his writings on **Vedanta and comparative religion**.

GEOGRAPHY

Origin and Evolution of Universe

PHYTOSAUR FOSSIL

Context:

Ancient fossilised remains discovered in Megha village, Jaisalmer, have sparked speculation of being a Phytosaur fossil dating back to the Late Triassic–Jurassic period.

About Phytosaur fossil:

What it is?

- Phytosaurs are extinct, large, semi-aquatic reptiles resembling modern crocodiles, belonging to the order *Phytosauria*.
- They thrived during the Late Triassic and possibly Early Jurassic, showing features like long snouts, heavy armour, and diverse feeding adaptations.

Found in:

- **Recent suspected fossil:** Megha village, Fatehgarh subdivision, Jaisalmer district, Rajasthan.
- **Earlier finds:** Akal and Thaiyat (confirmed dinosaur remains), plus shark and marine fossils in the region.

Features:

- **Fossil specimen:** ~6–7 feet long, spine structure visible, possibly Jurassic-age.
- Morphological diversity: long-snouted (fish-eating), short-snouted (terrestrial prey), and high-snouted (generalist feeders).
- Distribution: Phytosaur fossils reported from India, Europe, North America, Brazil, Morocco, Thailand, Madagascar.

Significance:

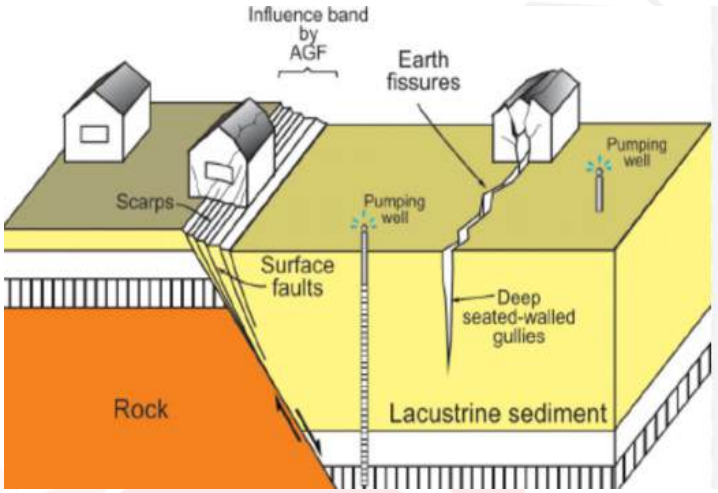
- Enhances Jaisalmer's reputation as a paleontological hotspot.
- Provides insights into **prehistoric biodiversity, convergent evolution with crocodilians, and climate-fauna history** of India's Jurassic formations.

Geomorphology

LAND SUBSIDENCE

Context:

Severe land subsidence in Chamoli's Nanda Nagar, Uttarakhand has destroyed seven buildings and left 16 others at risk, forcing evacuations and triggering panic among residents.



About Land Subsidence:

What it is?

- Land subsidence is the **gradual settling or sudden sinking of the Earth's surface** due to movement of underground materials.
- It may occur naturally or be induced by human activities.

Regions Affected:

- **Globally:** Parts of the **US (Chesapeake Bay, Louisiana), China, Indonesia, Iran**.
- **In India:** Joshimath (Uttarakhand), Chamoli, Himachal Pradesh, Delhi NCR (due to groundwater depletion).
- **Current hotspot:** Chamoli's Nanda Nagar (Uttarakhand Himalayas).

How Land Subsidence Happens?

- **Tectonic Setting:** In regions like the Himalayas, active plate convergence (Indian Plate pushing into Eurasian Plate) creates fractured and unstable bedrock. These weak zones allow ground layers to sink more easily.
- **Lithology (Soil & Rock Type):** Fine-grained alluvial soils, loess deposits, or unconsolidated sediments compact when water is removed. Clay-rich layers are especially prone to shrinkage.
- **Hydrology (Water Movement):** Over-extraction of groundwater lowers the water table. Pore pressure in sediments drops, causing soil grains to compress, leading to vertical sinking.
- **Geomorphic Processes:** Heavy rainfall, floods, and glacial meltwater infiltrate slopes, adding weight and reducing shear strength. This destabilises the slope–valley system.
- **Anthropogenic Impact:** Mining, tunneling, hydropower projects, and unregulated construction disturb the natural load balance and accelerate downward movement.

Implications:

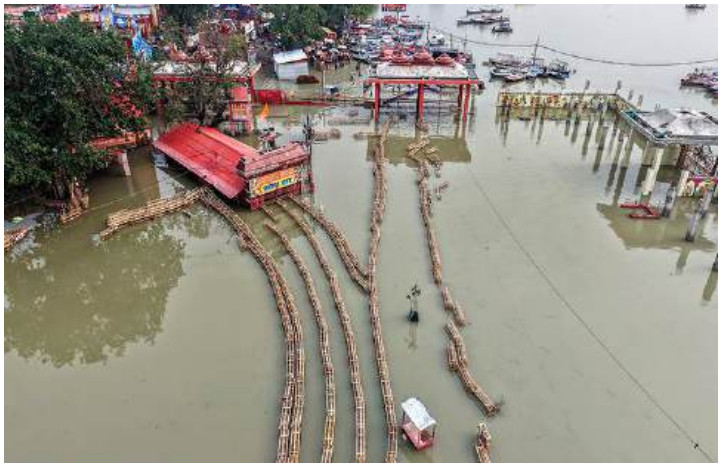
- **Humanitarian:** Displacement of families, loss of homes, trauma.
- **Infrastructure:** Cracks in roads, collapse of buildings, damage to utilities (pipelines, power lines).
- **Economic:** Rehabilitation costs, loss of tourism, strain on state disaster relief funds.

Climatology

MINI CLOUDBURSTS

Context:

The IMD clarified that while there is no rising trend in major cloudbursts, instances of "mini cloudbursts" are increasing in India.



About *Mini Cloudbursts:*

- **What it is?**
  - A mini cloudburst is a **sudden, high-intensity rainfall event** defined as **≥5 cm of rain in an hour** over a small area (~20–30 sq km), less severe than the IMD's official cloudburst criterion (≥10 cm/hr).
- **Criteria:**
  - Rainfall intensity: **≥5 cm/hour**.
  - Localised area: **~20–30 sq km**.
  - **Duration:** Short-lived but extremely intense.
- **Features:**
  - More frequent than full cloudbursts.
  - Short-range prediction remains **impossible**; only nowcasting of heavy clouding/rain is feasible.
  - Often unrecorded due to **lack of ground stations** in remote areas; satellite imagery has limited precision.
- **Regions Affected:**
  - **Himalayan states**: Himachal Pradesh, Uttarakhand, Jammu & Kashmir, Ladakh.
  - **Urban hotspots**: Chennai (example, Aug 30, 2025), Mumbai, Delhi NCR.
  - Regions with orographic influence (mountains forcing air uplift).
- **Implications:**
  - Trigger **flash floods, landslides, and infrastructure collapse** even at 2–5 cm/hour rainfall in hilly terrain.
  - Severe loss of **lives, crops, and property**.
  - Strain on **disaster preparedness and climate resilience policies**.

Physical Geography of India

INDIA DISCOVERS NATURAL GAS NEAR ANDAMAN ISLAND

Context:

Oil India Ltd (OIL) has announced the discovery of natural gas in the Andaman Shallow Offshore Block.

- This marks the **first reported hydrocarbon find** in the region, potentially reducing India's heavy import dependence on oil and gas.

About India Discovers Natural Gas near Andaman Island:

What it is?

- Natural gas reserves identified in ***Vijayapuram-2 exploratory well*** under the **Open Acreage Licensing Policy (OALP)**.
- Gas samples confirmed **87% methane** content, showing commercial potential after further testing.

Located in:

- Offshore block **9.20 nautical miles (17 km)** from the Andaman east coast.
- **Water depth:** 295 metres, drilling depth: **2,650 metres**.

Key Features of Andaman Islands:

- **Geography:** Archipelago of 300+ islands forming part of Andaman & Nicobar Union Territory, located in the Indian Ocean about 1,370 km east of mainland India.
- **Major Islands:** North, Middle, and South Andaman (together called *Great Andaman*) + Little Andaman. Nicobars lie further south.
- **Topography:** Series of **dome-shaped hill ranges**, highly dissected terrain and **Saddle Peak (737 m)** is the highest.
- **Ecology:** Rich in **tropical rainforests, mangroves, coral reefs**, and biodiversity hotspots; home to **indigenous tribes** like the **Sentinelese, Jarawa, Onge, Great Andamanese**.
- **Strategic Location:** Controls sea lanes of communication (SLOCs) in the Bay of Bengal, lying at the junction of the Bay of Bengal and Andaman Sea.
- **Geological Setting:** Islands formed of **sandstone, limestone, and shale** (Paleogene–Neogene age).
- **Disaster Prone:** Located in a **seismically active zone** — **severely impacted during the 2004 Indian Ocean Tsunami.**

Recent Oil Discovery:

- **First hydrocarbon occurrence** in the Andaman basin during ongoing exploration.
- Intermittent flaring observed at **2,212–2,250 metres** depth.

BARREN ISLAND VOLCANO

Context:

India's only active volcano at Barren Island, Andaman Sea, witnessed two mild eruptions on 13 and 20 September 2025.

About Barren Island Volcano:

What it is?

- India's **only active volcano** and South Asia's only confirmed active volcanic site.
- An uninhabited island with rugged volcanic cones, ash deposits, and sparse vegetation.

Located in:

- Situated in the **Andaman Sea**, about 138 km northeast of Port Blair.
- Part of the Andaman & Nicobar Islands, within the Indian Union Territory.

Origin:

- Belongs to a volcanic belt formed at the **convergent boundary of the Indian and Burmese tectonic plates.**
- **Geological history:** Oldest lava flows are **~1.6 million years old**, formed on an oceanic crust **~106 million years old**.

Features:

- **Size:** Island spans **~3 sq km**, rises **354 m above sea level**.
- **Structure:** Contains a **2 km wide caldera** formed by collapse of an earlier volcanic cone.
- **Eruption record:** First in **1787**, followed by multiple episodes (1991, 2005–07, 2017, 2022, 2025).
- **Activity type:** Low Volcanic Explosivity Index (VEI 2), mild lava flows and ash clouds.
- **Ecology:** Harsh terrain; past eruptions reduced local bird and fauna diversity.

Significance:

- **Geological importance** – Only active subaerial volcano between Sumatra and Myanmar.
- **Scientific research** – Helps study plate tectonics, volcanology, and oceanic crust evolution.
- **Strategic location** – Enhances India's maritime significance in the Andaman Sea.

NILGIRI TEA

Context:

Nilgiris tea growers are facing a persistent cost price crisis due to low prices for green tea leaves (GTL), overproduction, and weak auction mechanisms, threatening the sustainability of small growers in the region.

About Nilgiri Tea:

- **What it is?**
  - Nilgiri tea is a variety of **Camellia sinensis var. sinensis**, grown in the Nilgiris district of Tamil Nadu.
  - Known for its **brisk, fragrant, and full-bodied liquor**, it is often blended into iced teas, masala chai, and global tea brands.
- **Region:**
  - Cultivated mainly in the **Nilgiris district, Tamil Nadu**, with smaller areas in Kerala and Karnataka.
  - Recognised as a **Geographical Indication (GI) product** since 2008.
- **Features:**
  - Produces both **orthodox rolled teas** and **CTC (crush-tear-curl) teas**.
  - Flavour profile: **citrus and floral notes, light yet full-bodied**, retains clarity when cooled (ideal for iced tea).
  - Used in blends by **global commercial brands** like Nestea.
- **Geographic Conditions Needed:**
  - **Altitude: 1,000–2,500 metres** in the Western Ghats.
  - **Climate:** Two monsoons (Southwest & Northeast), alternating **fog, rain, and sunshine**.
  - **Soil: Lateritic loam**, rich and well-drained, supporting high-quality growth.
  - **Cultivation cycle:** Frequent plucking (≈32 times annually), with the first harvest ("**frost tea**") after a short dormancy in winter, noted for unique flavour.
- **Issues faced by Nilgiri tea industry:**
  - **Low Prices:** Green Tea Leaf (GTL) prices

often below cost of production.
- **Overcapacity:** Too many factories vs. crop output, reducing quality.
- **Market Dependence:** Heavy reliance on Russia/USSR in past; poor diversification.
- **Auction Problems:** Manipulation, advance deals, and weak price discovery.
- **Quality Concerns:** Adulteration and inconsistent standards.
- **High Costs:** Rising labour and input costs burden small growers.

ALUMINIUM

Context:
India's aluminium industry is under stress due to a rapid shift from aluminium to UPVC plastic in construction and rising cheap imports from ASEAN countries.

About Aluminium:

- **What it is?**
  - Aluminium is widely used for making **window frames, kitchen items, doors, roofs, and automotive parts**.
  - It is increasingly being replaced by **UPVC plastic**, which is derived from crude oil and raises environmental concerns under India's Paris Agreement commitments.
- **India's Status (Production, Imports & Exports)**
  - **Installed capacity** of aluminium extrusion industry: **3 million tonnes per annum**.
  - **Actual utilisation:** only **1.2 million tonnes**.
  - **Imports:** exceed **1.5 million tonnes**, driven by **price differences, FTA concessions, and duty-free access** under various HSN codes.
  - **Consumption:** India's per capita aluminium consumption is **~4 kg**, among the lowest globally, compared to **China (25 kg)**, **US (18 kg)**, and **world average (11 kg)**.
- **Importance of Aluminium in Industry:**
  - Critical for **construction sector**: doors, windows, facades, and structural applications.
  - Important for the **automotive industry**, which is shifting towards lightweight materials.
  - Plays a role in **renewable energy expansion**, especially solar.
  - India's **low aluminium consumption** limits the growth of the domestic industry despite high potential demand.
- **Raw Materials in India:**
  - India has significant **bauxite reserves**, the primary ore for aluminium production.
  - **Major producing states:**
    - **Odisha** – largest producer; major mines in Koraput, Kalahandi, Rayagada, Sundergarh (NALCO's Panchpatmali mines).
    - **Jharkhand** – deposits in Lohardaga, Gumla, Ranchi (Hindalco operations).
    - **Gujarat** – reserves in Jamnagar, Kutch, Junagadh.
    - **Chhattisgarh** – deposits in Bilaspur, Durg, Amarkantak plateau.
    - **Maharashtra** – Kolhapur district.
    - **Madhya Pradesh** – Amarkantak plateau, Maikala range.

River System

ALMATTI DAM

Context:
Karnataka has proposed raising the Almatti Dam height from 519.60 m to 524.256 m, expanding its capacity from 173 TMC to 300 TMC.

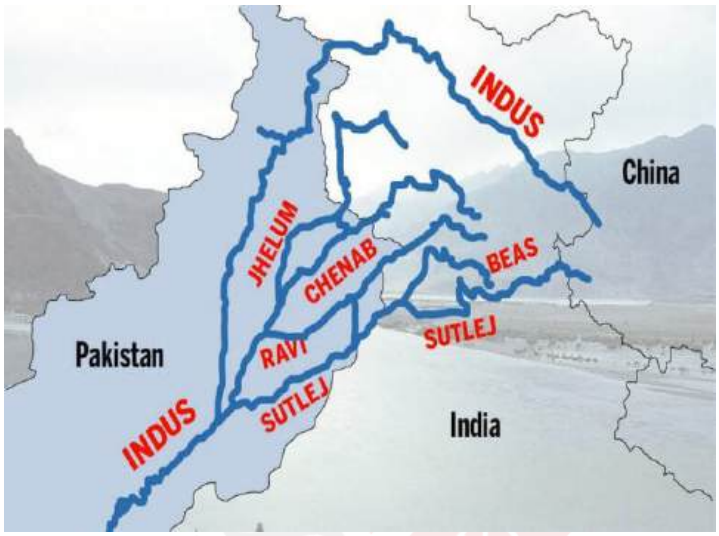
About Almatti Dam:

- **What it is?**
  - A **hydroelectric and irrigation project** forming the main reservoir of the Upper Krishna Irrigation Project.
  - Commissioned in **2005**, with an installed power generation capacity of **290 MW**.
- **Located in:**
  - **Bijapur (Vijayapura) district**, Karnataka (with submergence in Bagalkot).
- **River:**
  - Built across the **Krishna River**, one of South India's major east-flowing rivers.
- **States Involved:** Karnataka, Telangana, Andhra Pradesh, Maharashtra (all riparian states of the Krishna basin).
- **Features:**
  - **Current gross storage:** 123.08 TMC at 519 m MSL.
  - **Planned expansion:** 300 TMC at 524.256 m MSL.
  - Downstream release to **Narayanpur reservoir** for irrigation.
- **Major Dams on Krishna River:**
  - **Almatti Dam** – Karnataka.
  - **Narayanpur Dam** – Karnataka.
  - **Srisailam Dam** – Andhra Pradesh/Telangana border.
  - **Nagarjuna Sagar Dam** – Telangana/Andhra Pradesh.
  - **Jurala Project (Priyadarshini Dam)** – Telangana.
  - **Pulichintala Project** – Andhra Pradesh.
  - **Prakasam Barrage** – Andhra Pradesh.
- **Issue:**
  - **AP's Concerns:** Raising Almatti's capacity and Telangana's new projects could reduce Krishna water availability to Andhra, the **tail-end state**.
  - **Legal Dispute**: Alleged violation of **Bachawat Tribunal (KWDT-I)** allocations.
  - **Financial Stakes**: Karnataka approved **₹70,000 crore** for canals, while Telangana plans **100 TMC diversion** for 11.3 lakh acres ayacut.

BEAS AND SUTLEJ RIVERS

Context:

Rising water levels in the Beas and Sutlej rivers have posed a severe threat to Marar village in Tarn Taran (Punjab), causing erosion and endangering homes despite embankment-strengthening efforts.



About Beas and Sutlej rivers:

About Beas River:

- **Origin:** Near **Rohtang Pass**, southern Pir Panjal Range, Himachal Pradesh (altitude ~4,062 m).
- **Length:** About **460–470 km**, lies entirely within India.
- **Course:** Flows through **Kullu, Mandi, Kangra (Himachal Pradesh)** → enters Punjab → meets **Sutlej at Harike**.
- **Basin area:** **~20,300 sq km**.
- **Key Features:**
  - Known as *Vipasa* (Vedic) and *Hyphasis* (Greek).
  - Divides into channels in lower reaches before reuniting.
  - Major source for irrigation, drinking water, and hydropower.

About Sutlej River:

- **Origin:** **Mansarovar–Rakastal Lakes**, western Tibet (~4,570 m). Called *Langqen Zagbo* in Tibet.
- **Length:** **~1,450 km total**, of which **1,050 km in India**.
- **Course:**
  - Flows northwest to **Shipki La** **(Tibet–Himachal border)**.
  - Cuts gorges across Himalayas → enters Punjab plains at **Rupnagar (Ropar)**.
  - Joins **Beas at Harike**, then flows into Pakistan → merges with Indus near **Mithankot**.
- **Catchment area:** **~56,860 sq km** (20,000 sq km in India).
- **Key Features:**
  - **Bhakra Dam** built on Sutlej (Naina Devi Dhar).
  - Forms **~120 km India–Pakistan boundary** in Punjab.
  - Major tributaries: **Beas and Ravi**.

Indian and World Human Geography

POWER OF SIBERIA 2 PIPELINE

Context:
Russia's Gazprom signed a deal with China National Petroleum Corporation (CNPC) to build the Power of Siberia 2 pipeline.

About Power of Siberia 2 Pipeline:

- **What it is?**
  - A proposed **natural gas pipeline project** connecting western Siberia (Russia) to China via Mongolia.
  - Expansion of the earlier **Power of Siberia 1 pipeline** (operational since 2019).
- **Nations Involved:**
  - Runs through **Russia → Mongolia → China**, covering ~6,700 km.
- **Aim:**
  - To replace lost European gas revenue after EU sanctions and Russia's cutoff following the Ukraine war.
  - To strengthen Russia–China energy cooperation and reduce dependence on Western markets.
- **Features:**
  - **Length:** The pipeline will be about **6,700 km long**, starting from Russia's **Yamal Peninsula**, passing near **Lake Baikal**, through **Mongolia**, and finally reaching **China**.
  - **Capacity:** It will be able to carry around **50 billion cubic metres of gas every year**.
  - **Comparison:**
    - Earlier, Russia used to send up to 180 billion cubic metres of gas every year to Europe. The first pipeline to China (Power of Siberia 1) carries 38 billion cubic metres per year.
    - Power of Siberia 2 is big, but still much smaller than Europe's old demand.

GEOTAGGING OF BUILDINGS IN CENSUS

Context:
The 2027 Census of India will introduce geotagging of all buildings for the first time during Houselisting Operations.

About Geotagging of Buildings in Census:

- **What it is?**
  - Geotagging is the process of assigning latitude–longitude coordinates to each building and mapping it on a Geographic Information System (GIS).
  - It provides a precise digital identity to every structure in India.
- **Launched in:** To be carried out as part of **Houselisting Operations (HLO), 2026**, the first phase of Census 2027.
- **Objective:**
  - To ensure accurate counting of buildings and households.
  - To improve workload management for enumerators and remove discrepancies of manual sketch maps.
- **How it works?**
  - Enumerators will visit assigned Houselisting Blocks (HLBs).
  - They will use smartphones and Census mobile app with location enabled.
  - Each building will be digitally marked and classified (residential, non-residential, mixed use, landmark).
  - Data on Census Houses and Households will be recorded simultaneously.
- **Key Features:**
  - **Digital Layout Mapping (DLM)** replaces

hand-drawn sketches used in earlier Censuses.
    - Enumerators will use their **own smartphones** (unlike SECC 2011 where tablets were provided).
    - Geotagging to be integrated with other Census datasets (population, socio-economic, cultural).
- **Significance:**
    - **Accuracy** – Reduces duplication and omission of houses.
    - **Efficiency** – Helps in fair distribution of workload across 34 lakh+ enumerators.
    - **Policy Use** – Enables better targeting of welfare schemes (housing, urban planning, rural development).
    - **Transparency** – Provides verifiable geospatial data for governance.

THE APATANIS TRIBE

Context:

The Apatani women of Ziro Valley, Arunachal Pradesh, represent the last generation to wear the tribe's traditional facial tattoos and wooden nose plugs, a practice banned in the 1970s but still proudly carried by elderly women.

About The Apatanis Tribe:

- **Who They Are?**
    - The **Apatani (Tanw, Apa Tani, or Apa)** are an indigenous tribal group of Arunachal Pradesh.
    - Known for their **distinct cultural identity, ecological knowledge, and traditional practices**.
- **Habitat:**
    - Primarily inhabit the **Ziro Valley**, located in the **Lower Subansiri district** of Arunachal Pradesh.
    - Valley is bowl-shaped, scenic, and lies in the **eastern Himalayan ranges**.
- **Apatani Facial Tattoos:**
- **History:**
    - It was introduced as a **tribal protection strategy** during times when **raids and abductions by neighbouring tribes** were common.
    - Over time, it evolved into a **marker of identity and cultural pride**, signifying a woman's belonging to the Apatani community.
- **Reasons:**
    - **Protection from Abduction:** Tattoos and large wooden nose plugs were intended to make Apatani women appear less attractive to outsiders and rival tribes.
    - **Identity & Dignity:** Became a **symbol of honour, belonging, and dignity** within the community.
    - **Cultural Beauty Standard:** Among the Apatanis, tattoos later became associated with **tribal beauty ideals**, despite being unusual to outsiders.
- **Custom & Process:**
    - **Age of Tattooing:** Typically done when girls were around **10 years old**.
    - Conducted by elder women of the tribe.
    - **Design (Tippei):**
        - A vertical line from the **forehead down to the tip of the nose**.
        - Five lines tattooed on the **chin**.
    - **Nose Plugs (Yaping Hullo):** Large wooden plugs inserted into both sides of the nose after cleaning the wood to prevent infection.
    - **Community View:** Women with tattoos and plugs were considered honourable, proud custodians of tradition, and protectors of family dignity.
- **Decline:**
    - In the early 1970s, the government banned the practice, citing social stigma and hindrances to women's employment opportunities in modern settings.
    - Today, only elderly Apatani women still bear tattoos and plugs, making them the last living carriers of this tradition.

Map Based Questions from World

GRAND ETHIOPIAN RENAISSANCE DAM (GERD)

Context:
Ethiopia inaugurated the Grand Ethiopian Renaissance Dam (GERD), Africa's largest hydroelectric project, hailing it as a "great achievement," even as Egypt lodged a protest at the UN, calling it an existential threat to its water security.

About Grand Ethiopian Renaissance Dam (GERD):

- **What it is?**
  - Africa's largest hydroelectric project, a **megadam built for power generation** and regional energy trade.
  - A unifying national project for Ethiopia, though geopolitically contested.
- **Location & River:**
  - Constructed on the **Blue Nile River**, about 30 km upstream from Sudan, in Guba, Ethiopia.
  - Blue Nile contributes **~85% of Nile waters**, making it geopolitically sensitive.
- **Nation Building It:**
  - Ethiopia initiated the project in **2011**, seeing it as a symbol of self-reliance, development, and regional influence.
- **Features:**
  - **Height:** ~170 m and **Length:** ~2 km.
  - **Reservoir capacity:** 74 billion cubic metres (flooding ~1,874 km²).
  - **Power capacity:** 5,150–6,450 MW – largest in Africa.
  - Designed to trap ~100 years' worth of sediment inflow, though actual yields may be higher.

About Blue Nile River:

- **What it is?**
  - One of the two major headstreams of the **Nile River**, providing **~70% of its floodwaters** at Khartoum.
  - Known as the **Abay River** in Ethiopia.
  - **Total length:** ~1,460 km (907 miles).
- **Origin:**
  - Rises from a **spring near Lake Tana**, northwestern Ethiopia, at ~1,800 m (6,000 ft) above sea level.
  - Flows into and out of **Lake Tana**, then descends through rapids and gorges of the Ethiopian highlands.
- **Nations It Flows Through:**
  - **Ethiopia** → through deep canyons and around Choke Mountains.
  - **Sudan** → flows northwest to join the White Nile at **Khartoum**, forming the main Nile.
- **Tributaries:**
  - Major tributaries include:
    - **Dinder River** (from Ethiopian highlands).
    - **Rahad River** (from Ethiopian highlands).
  - Together they significantly augment the Blue Nile's flow.

SOCIETY AND SOCIAL JUSTICE

THE HINDU SUCCESSION ACT, 1956

Context:
The Supreme Court has said it will move *cautiously* while examining petitions challenging provisions of the Hindu Succession Act, 1956, stressing the need to balance women's rights with preserving the Hindu social structure.

About The Hindu Succession Act, 1956:

What it is?

- An Act to codify and amend Hindu law relating to intestate succession (succession without a will).
- Came into force on **17 June 1956**, extending across India except Jammu & Kashmir (at the time).

Aim:

- To bring uniformity and clarity in property succession among Hindus.
- To remove gender-based discrimination and gradually ensure women's rights in inheritance.

Coverage:

- Applies to **Hindus, Buddhists, Jains, and Sikhs**.
- Excludes Muslims, Christians, Parsis, and Jews unless proven they were governed by Hindu law earlier.
- Does not apply to Scheduled Tribes unless notified by the Central Government.

Key Provisions:

1. **Coparcenary Rights (Section 6, amended 2005)** – Daughters made coparceners by birth with equal rights and liabilities as sons.
2. **Succession of Males (Sections 8–10)** – Property devolves first to Class I heirs (son, daughter, widow, mother, etc.), then Class II, then agnates, then cognates.
3. **Women's Property (Section 14)** – Any property owned by a female Hindu, before or after 1956, is her **absolute property** (not limited ownership as under earlier law)
4. **Succession of Females (Sections 15–16)** – If a Hindu woman dies intestate, property devolves first to her children and husband, then husband's heirs, then her parents, then father's heirs, and lastly mother's heirs.
5. **General Principles (Sections 18–22)** – Full blood preferred over half blood, unborn child's inheritance recognized, disqualification of murderer/converts' descendants from inheriting, preferential rights for co-heirs.
6. **Escheat (Section 29)** – If no heir is found, property devolves to the Government with obligations attached.

KURMIS

Context:

Kurmis in West Bengal, Jharkhand, and Odisha have revived their agitation demanding Scheduled Tribe (ST) status and inclusion of Kurmali language in the Eighth Schedule of the Constitution.

About Kurmis:

- **What It Is?**
  - **Kurmi / Kudmi Community:** A historically agrarian and peasant community, presently classified as **OBC** in most States.
  - **Demand:** Recognition as a **Scheduled Tribe** and codification of their Sarna (nature-worshipping) religion.
- **Region Found In:**
  - **West Bengal:** Jhargram, Bankura, Paschim Medinipur, Purulia (Junglemahal region).
  - **Jharkhand:** Palamu, Kolhan, North & South Chotanagpur.
  - **Odisha:** Mayurbhanj and adjoining areas.
  - **Bihar:** Presence in Purnia, Katihar, Araria districts (linked to OBC Kurmis).
- **Historical Background:**
  - **1931 Census:** Listed as "Scheduled Tribes."
  - **Post-Independence:** Excluded from ST list in 1950 without formal notification.
  - **Freedom Struggle Contribution:** Played major roles in **Chuar Rebellion**, **Indigo Rebellion**, **Santhal Uprising**, and **Quit India Movement** (leaders like Raghunath Mahato, Gopal Mahato).
  - **British Era Recognition:** Gazette notifications (1913 & 1931) identified them as a "Notified Tribe" with distinct customary inheritance practices.
- **Key Features:**
  - **Agrarian Community:** Primarily engaged in farming; famed as market gardeners and land-clearers.
  - **Totemic & Nature-Worshipping:** Follow Sarna religion, worship nature, hills, trees—claim tribal cultural continuity.
  - **Distinct Identity:** Reject identification with Kshatriya Kurmis of north India, assert Dravidian/tribal roots.
  - **Present Status:** Classified as OBC under Chotanagpur Tenancy Act (CNT) 1908, demanding ST re-inclusion and language recognition.

DE-NOTIFIED, NOMADIC AND SEMI-NOMADIC TRIBES (DNTS)

Context:

Development and Welfare Board for De-notified, Nomadic and Semi-Nomadic Communities (DWBDNC) members wrote to PM seeking permanent commission status, staff, funds, and financial powers.

About De-notified, Nomadic and Semi-Nomadic Tribes (DNTs):

Who They Are?

- **De-notified Tribes (DNTs):** Communities once listed under **Criminal Tribes Act, 1871** by British, branded as "born criminals."
- **Nomadic Tribes (NTs):** Groups practicing **seasonal/ continuous migration** for livelihood (salt trading, animal rearing, folk entertainment).
- **Semi-Nomadic Tribes (SNTs):** Follow **less frequent, shorter migrations** compared to nomads.

Historical Background:

- **1871-1947:** Criminal Tribes Act notified ~200 communities as "criminal."
- **1952:** Act repealed; communities officially "de-notified."
- **2008:** **Renke Commission** listed DNTs, highlighted extreme marginalisation.
- **2017:** **Idate Commission** identified ~1,200 DNT/NT/ SNT groups (many already in SC/ST/OBC lists, 269 unclassified).

Current Status in India:

- **Population:** Around **10% of India's population** (~13 crore people).
- **Spread:** 150 DNT groups, ~500 nomadic communities across states.

Cultural & Social Character:

- Rich cultural traditions, own **deities, festivals, oral literature, and dispute-resolution systems**.
- Traditionally moved in groups of 5–20 families; annual camps used for reunions, marriages, cattle trade.

About Development & Welfare Board for DNT/NT/SNT (DWBDNC):

What It Is?

- **Advisory & facilitative body** under **Ministry of Social Justice & Empowerment** for development of DNT/NT/SNT communities.

Origin:

- Constituted on **21 February 2019** by Gazette notification following **Idate Commission's recommendations**.
- Intended as an **alternative to a permanent commission** to avoid overlap with SC/ST/OBC commissions.

Structure:

- **Chairperson:** Secretary, Ministry of Social Justice & Empowerment (ex-officio).
- **Members:** Two nominated members with three more seats vacant.
- Also includes representatives from **Tribal Affairs Ministry**, **Department of School Education**, and officials of Social Justice Ministry.

Functions:

- **Policy Advisory:** Recommend legal recognition & categorisation of DNT/NT/SNT groups.
- **Scheme Implementation:** Oversee **SEED scheme**, scholarships (Dr. Ambedkar Pre/Post-Matric), hostel schemes, skill development.
- **Grievance Redressal:** Serve as nodal body to address community issues.
- **Data & Research:** Facilitate surveys, maintain updated database for evidence-based policymaking.
- **Coordination:** Engage with state governments for community certificates, land allocation, housing rights, and education parity.

EDUCATE GIRLS WINS 2025 RAMON MAGSAYSAY AWARD

Context:

Educate Girls, an Indian NGO working to bring out-of-school girls into classrooms, has won the 2025 Ramon Magsaysay Award.

- It is the first Indian organisation (not individual) to be honoured with this award, often called the "Asia's Nobel Prize".

About Ramon Magsaysay Award:

- **What it is?**
  - Asia's most prestigious award, given annually for exceptional courage, integrity, and service to people.
- **Established in:** 1957, by the Rockefeller Brothers Fund in memory of Philippine President Ramon Magsaysay (died 1957 in a plane crash).
- **Eligibility:** Individuals and organisations from Asia showing "greatness of spirit in selfless service to the people."
- **Features:** Each awardee receives a medallion with Magsaysay's image, a certificate, and a cash prize.
- **Indian Winners**:
  - Vinoba Bhave (1958) – 1st Winner
  - **In recent years:**
    - **Bezwada Wilson and T.M. Krishna** (2016) - Human Rights; Carnatic Music
    - **Bharat Vatwani and Sonam Wangchuk** (2018) - Restoring Health and Dignity to Troubled Lives; Education for Community Progress
    - **Ravish Kumar** (2019) – Journalism
    - **Dr. Ravi Kannan R.** (2023) - Healthcare
    - **2025 Special Note**: *Educate Girls* became the first Indian organisation to win.

About Educate Girls NGO:

- **Full Name:** Foundation to Educate Girls Globally (popularly *Educate Girls*).
- **Founded in:** 2007 by **Safeena Husain**, a London School of Economics graduate.
- **Aim:** To break the cycle of illiteracy and poverty by mobilising communities and governments to support **girls' education** in rural and disadvantaged areas. Motto: *"One girl at a time."*
- **Functions/Initiatives**:
  - **Community mobilisation**: Identifying out-of-school girls, enrolling and retaining them.
  - **Government partnerships**: Scaling programmes with state support.
  - **Innovative finance**: Launched the world's first **Development Impact Bond (2015)** in education.
  - **Pragati Programme**: Open schooling for young women (15–29 years) to complete secondary education.
  - **Impact**: Now operates across **30,000 villages**, benefitting over **2 million girls**, with >90% retention rate.

PARTICULARLY VULNERABLE TRIBAL GROUPS

Context:

The Ministry of Tribal Affairs (MoTA) has asked the Census Commissioner to enumerate Particularly Vulnerable Tribal Groups (PVTGs) separately in the upcoming Census.

About Particularly Vulnerable Tribal Groups (PVTGs):

Who They Are?

- PVTGs are a **sub-category of Scheduled Tribes (STs)**, identified as the most disadvantaged among tribals.
- The concept came from the **Dhebar Commission (1960–61)**, which recommended special focus for groups facing greater backwardness.
- Initially 52 groups were identified in the **5th Five-Year Plan (1974–79)**; later 23 were added in 2006 → now **75 groups** in total.

Habitat:

- Spread across **18 states and the Andaman & Nicobar Islands**.
- Many live in **remote forests, hilly regions, or islands** with poor access to infrastructure.
- Examples: **Baigas (Madhya Pradesh, Chhattisgarh), Abujh Marias, Jarawas, Onges, Sentinelese, Shompens.**

Characteristics:

- **Declining/stagnant population** and high vulnerability.
- **Geographical isolation** with limited outside contact.
- Dependence on **pre-agrarian practices** like hunting, gathering, shifting cultivation.
- **Low literacy, poor health, and economic backwardness** compared to other STs.
- Distinct **cultural and social practices**, often outside mainstream society.

Need for Separate Count:

- **No previous Census** has separately enumerated PVTGs; most are included under the general ST category.
- Having **exact numbers and socio-economic data** will improve targeting of schemes in health, education, and livelihoods.
- Helps identify **infrastructure gaps** in their habitations for schemes like PM JANMAN (₹24,104 crore launched in 2023).
- Ensures protection of their **habitat rights** and preservation of their unique cultures.
- Clarifies whether existing **PVTG criteria remain relevant**, as some groups may have improved while others worsened.

FACTS FOR PRELIMS GENERAL STUDIES – 2

Salient Features, Schedules and Preamble

FOREIGNERS TRIBUNALS

Context:

The **Union Home Ministry** has empowered **Foreigners Tribunals (FTs)** under the Immigration and Foreigners Act, 2025 to issue **arrest warrants** and send suspected illegal immigrants to detention centres.

- This replaces the 1964 order and gives FTs powers equal to a **first-class judicial magistrate**.

About Foreigners Tribunals:

- **What it is?**
  - Quasi-judicial bodies set up to determine whether a person is a "foreigner" under Indian law.
  - Unique to Assam; elsewhere, illegal migrants are tried in local courts.
- **Established in:**
  - **1964**, through the *Foreigners (Tribunals) Order*, under the **Foreigners Act, 1946**.
- **Act Powered:**
  - Now governed by the **Immigration and Foreigners Act, 2025**, which repealed older laws and replaced the 1964 order.
- **Aim:**
  - To decide citizenship status of suspected individuals.
  - Provide due process before declaring anyone a foreigner.
- **Functions:**
  - Issue notices to suspected individuals to prove citizenship within 10 days.
  - Examine documents and witnesses related to nationality claims.
  - Dispose of cases within 60 days of reference.
  - Send declared foreigners to detention/ transit camps for deportation.

New Powers (2025 Order)

- Authority of a **civil court** and a **first-class magistrate**.
- **Powers include:**
  1. Summoning and examining persons on oath.
  2. Requiring discovery and production of documents.
  3. Issuing commissions for witness examination.
  4. Directing personal appearance of the accused.
  5. **Issuing arrest warrants** for non-appearance.
  6. Sending individuals to detention centres if proof of citizenship is not produced.

Parliament and State Legislature

VICE PRESIDENT ELECTION – SYSTEM OF PROPORTIONAL REPRESENTATION

Context:

Polling for the Vice-Presidential election began on September 9, 2025, following the resignation of Jagdeep Dhankhar.

- Prime Minister of India cast the first vote, with CP Radhakrishnan and Justice B. Sudershan Reddy contesting for the post.

About Vice President Election – System of Proportional Representation:

What it is?

The Vice President of India is elected by an **Electoral College of both Houses of Parliament** (Lok Sabha + Rajya Sabha, elected & nominated members) using the system of proportional representation by means of the **single transferable vote (STV)**, conducted through a secret ballot.

How the Vice President Election Works?

1. **Electoral College:**
   - Composed of all elected **and nominated members** of both the **Lok Sabha and Rajya Sabha**.
   - Unlike the President's election, State Legislatures are **not part** of this process.
2. **Equal Value of Votes:**
   - Each MP's vote has the **same value = 1**.
   - This makes the process straightforward compared to the President's election, where vote value differs.
3. **Ballot Paper & Preferences:**
   - Ballot papers are **pink**, bilingual (Hindi & English).
   - Candidates' names are listed in the first column; the second column is for **preferences**.
   - MPs mark their choice by writing **1, 2, 3…** against candidates' names (in international numerals, Indian scripts, or Roman numerals).
   - Writing "one", "two" in words or leaving it blank invalidates the preference.
4. **Quota Calculation (Winning Threshold):**
   - The winning candidate must secure a **quota** of votes = (Total Valid Votes Cast ÷ 2) + 1
   - Example: If 780 MPs vote, the quota is (780 ÷ 2) + 1 = **391 votes**.
5. **Counting & Transfer of Votes:**
   - **First Preference Count:** All "1" marked votes are tallied.
   - If a candidate reaches the quota in this round → declared elected.
   - If no candidate reaches the quota:
     - The **candidate with the least votes is eliminated**.
     - Their votes are **transferred** to the next preference ("2") marked by those MPs.
   - This process continues until one candidate crosses the required quota.
6. **Secret Ballot:**
   - Voting is **confidential**. MPs are not bound by any party whip because **anti-defection law does not apply**.
   - This allows for **cross-voting**, making outcomes less predictable.

Significance:

- **Democratic legitimacy:** Ensures the Vice President is elected with majority support of MPs across parties.
- **Checks dominance:** Preference voting system reduces chances of unfair victory by a simple plurality.
- **Institutional balance:** Strengthens the role of Vice President, who is also the ex-officio Chairman of Rajya Sabha.

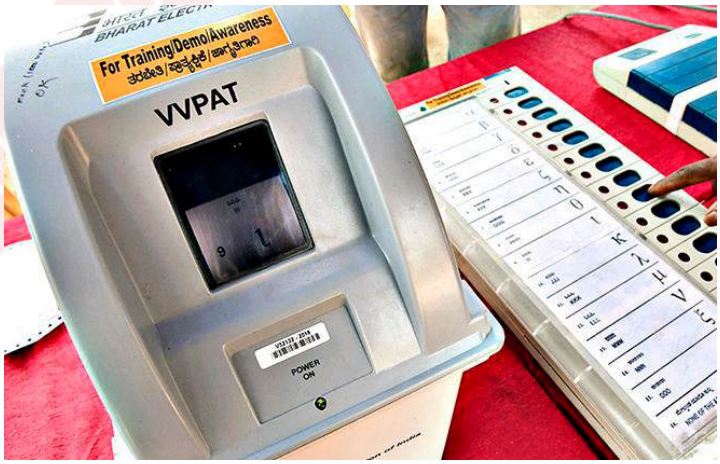
Bodies (Constitutional, Statutory, Regulatory Bodies)

EVMS TO HAVE COLOUR PHOTOS OF CANDIDATES

Context:

Election Commission of India (ECI) has revised EVM ballot paper norms under Rule 49B of the Conduct of Election Rules, 1961.

- From Bihar Assembly elections onward, ballot papers will carry colour photographs of candidates, larger serial numbers, and improved design for clarity.



About EVMs to Have Colour Photos of Candidates:

What It Is?

- A **revised guideline** for Electronic Voting Machine (EVM) ballot papers.
- Mandates **colour candidate photographs** on ballot papers for the first time to enhance **voter visibility and identification**.

Aim of the Reform

- Improve **clarity, transparency, and voter experience**.
- Reduce voter confusion in constituencies with multiple candidates having similar names/symbols.
- Strengthen **free and fair election principles** through better ballot paper design.

Procedure & Governance:

- Governed by **Rule 49B, Conduct of Election Rules, 1961** (design & printing of ballot papers).
- Chief Electoral Officers (CEOs) of all States/UTs directed to implement revised format.
- Printing to be done at **government/semi-government presses**, private presses only if required capacity is unavailable — with strict safety protocols.

Key Features:

- **Colour Photographs:** Candidate face covers **75% of allotted space** for easy recognition.
- **International Numerals:** Candidate/NOTA serial numbers printed in bold (size 30).
- **Better Paper Quality:** Pink paper for Assembly elections with specified RGB values.
- **Layout Standardization:**
  - Max 15 candidates per sheet and NOTA placed after last candidate.
  - If fewer than 16 candidates, remaining space kept blank.
- **Uniform Font:** Names printed in same bold typeface for readability.

Significance:

- **Voter-Friendly:** Helps first-time voters, elderly, visually weaker voters to identify candidates quickly.
- **Transparency Boost:** Reduces scope for impersonation/confusion in candidate identity.
- **Electoral Credibility:** Strengthens ECI's commitment to fair and inclusive elections.

CENTRAL INFORMATION COMMISSION (CIC)

Context:

The Central Information Commission (CIC) has been headless for the 7th time in 11 years after Chief Information Commissioner Heeralal Samariya retired.

About Central Information Commission (CIC):

What It Is?

- The CIC is the **apex appellate body** under the **Right to Information (RTI) Act, 2005**, responsible for adjudicating second appeals and complaints regarding access to public information.

Established In:

- Constituted on **12 October 2005** by a **Central Government notification** under Section 12 of the RTI Act, 2005.

Headquarters: New Delhi, India

Structure:

- **Chief Information Commissioner (CIC)** + up to **10 Information Commissioners (ICs)**.
- Appointment made by a **committee** comprising:
  1. Prime Minister (Chairperson)
  2. Leader of Opposition in Lok Sabha
  3. Union Cabinet Minister nominated by PM

Aim:

- Ensure **transparency and accountability** in governance by enforcing citizens' **Right to Information**.
- Reduce corruption and promote citizen participation in democracy.

Functions & Powers:

- **Adjudication:** Hears second appeals against decisions of Central Public Information Officers (CPIOs).
- **Complaints Handling:** Inquires into refusal, delay, denial, or unreasonable fees for RTI applications (Sec 18).
- **Monitoring:** Ensures suo motu disclosures by public authorities (Sec 4).
- **Penalties:** Can impose penalties on erring officials for non-compliance (Sec 20).
- **Annual Reporting:** Submits annual report on RTI implementation to Parliament (Sec 25).
- **Quasi-Judicial Powers:**
  - Summon witnesses, enforce attendance, receive evidence on oath.
  - Requisition public records and examine them during inquiry.
  - Issue directions to improve record-keeping and proactive disclosure.

Local Government

MANKI-MUNDA SYSTEM

Context:

Ho tribals in Jharkhand's Kolhan region staged protests alleging interference in their traditional Manki-Munda self-governance system after some Mundas were removed.

About Manki-Munda System:

What it is?

- A **traditional, decentralised self-governance model** followed by the Ho tribe of Jharkhand's Kolhan region.
- It revolves around **village heads (Mundas)** and **pidh heads (Mankis)** who collectively resolve disputes and maintain order.

Origin & History:

- Pre-British era: Functioned as a **community-driven governance system** with no concept of land tax or external sovereign control.
- **British Era Recognition:**
  - After early Ho and Kol revolts, the British realised direct control was unsustainable.
  - In **1833**, Captain Thomas Wilkinson codified the system in **31 rules** (Wilkinson's Rules), later implemented in Kolhan Government Estate (KGE) in 1837.
  - Mankis and Mundas were made intermediaries between colonial administration and the community, integrating Kolhan into British India while preserving autonomy.

How it Works?

- **Munda:** Head of a single village, resolves socio-political disputes locally.
- **Manki:** Head of a pidh (cluster of 8–15 villages), hears appeals when Munda-level resolution fails.
- System relies on **customary law**, not formal legislation, and continues in use even after Independence.

Key Features:

- **Hereditary Leadership:** Roles are passed from father to son.
- **Decentralised & Community-based:** Gram Sabha–like participation in dispute resolution.
- **Cultural Autonomy:** Protects Ho identity, traditions, and land rights.
- **Legal Continuity:** Though challenged, courts have allowed Wilkinson's Rules to continue due to lack of alternatives.

Judiciary

SC GUIDELINES ON DNA

Context:

The Supreme Court in Kattavellai @ Devakar v. State of Tamil Nadu issued uniform guidelines for the collection, preservation, and presentation of DNA samples in criminal cases.

About SC Guidelines on DNA:

What it is?

- A landmark set of **four procedural guidelines** issued by SC to ensure **integrity, reliability, and timely handling** of DNA evidence in criminal investigations.
- Aims to standardise chain of custody across all States despite policing being a State subject.

Case Name: Kattavellai @ Devakar v. State of Tamil Nadu (2025) – involved rape, murder, and robbery.

Key Features:

- **Proper Documentation:** Every DNA sample must be packaged with FIR details, case sections, names of IO, medical officer, and independent witnesses, ensuring traceability from the start.
- **Timely Dispatch (48-Hour Rule):** Investigating Officer must transport DNA samples to **Forensic Science Laboratory** within 48 hours of collection.
  - Any delay must be explained in writing, and proper refrigeration/preservation is mandatory.
- **No Tampering During Storage:** Once sealed, the package cannot be opened, altered, or resealed without trial court's explicit permission.
- **Chain of Custody Register:** A detailed register must record every transfer of the sample—from collection to court disposal—signed by all handlers.

Judicial Precedent:

- **Anil v. State of Maharashtra (2014):** DNA profile valid but depends on lab quality control.
- **Manoj v. MP (2022):** DNA report rejected due to contamination risk from open recovery site.
- **Rahul v. Delhi (2022):** DNA report rejected due to 2-month Malkhana storage without safeguards.

Welfare schemes

FRONTIER 50 INITIATIVE

Context:

Niti Aayog announced the 'Frontier 50 Initiative' to implement frontier technology solutions in 50 Aspirational Districts/Blocks, fast-tracking India's march towards Viksit Bharat 2047.

About Frontier 50 Initiative:

- **What it is?**
  - A **flagship program** by NITI Aayog to deploy **frontier technologies** (AI, IoT, drones, blockchain) in **50 Aspirational Districts/ Blocks** to improve service delivery, productivity, and citizen well-being.
- **Launched By:** NITI Aayog under its Frontier Tech Hub.
- **Objective:**
  - Fast-track adoption of **proven frontier tech use cases** from the **Frontier Tech Repository**.
  - Achieve **saturation of government services** (health, education, skilling, welfare delivery).
  - Bridge the **digital and development divide** in under-served regions by 2047.
- **Key Features:**
  - **50 Pilot Districts/Blocks:** Selected from Aspirational District Programme (ADP) / Aspirational Block Programme (ABP) for maximum impact.
  - **Use-Case Deployment:** Each district/block to select **priority use cases** in agriculture, health, education, livelihoods.
  - **Capacity Building:** Local administration trained to scale up tech adoption.
  - **Public-Private Partnerships:** Collaboration with startups, industry, and academia to co-create solutions.
  - **Monitoring & Outcomes:** KPIs defined to measure service delivery, citizen impact, and replicability across India.

Miscellaneous

THE FOREIGN CONTRIBUTION (REGULATION) ACT

Context:

The Ministry of Home Affairs (MHA) cancelled the FCRA license of climate activist Sonam Wangchuk's NGO, shortly after a violent protest in Leh that the MHA claimed his statements "incited."

About The Foreign Contribution (Regulation) Act (FCRA):

What It Is?

- **Definition:** The **Foreign Contribution (Regulation) Act, 2010 (FCRA)** is a comprehensive law enacted to regulate the acceptance and utilisation of foreign donations by individuals and associations in India.
- **Historical Context:** First enacted in **1976** during the Emergency, it aimed to prevent foreign powers from interfering in India's internal affairs, a concern articulated in Parliament as early as 1969.

Aim:

- **Primary Aim:** To ensure that foreign donations are utilised for the intended purpose and that the recipient organisations function consistently with the values of a **sovereign democratic republic.**
- **Governing Institution:** The **Union Ministry of Home Affairs (MHA)** is the nodal ministry responsible for the registration, monitoring, and enforcement of the FCRA.

Key Features:

1. **Mandatory Registration:** Requires every person or NGO receiving foreign funds to be **registered** under

the Act and obtain a valid license, which is valid for **five years**. Renewal is mandatory within six months of expiry.

2. **Banking Mandate:** Stipulates that foreign funds must be received only in a designated bank account, specifically at the **State Bank of India (SBI), New Delhi**.
3. **Prohibition of Transfer:** Bars NGOs from **transferring foreign funds to any other unregistered person or NGO**, ensuring direct utilisation by the recipient.
4. **Barred Recipients (Foreign Contribution 'Prohibited'):** Explicitly prohibits the receipt of foreign funds by individuals and entities deemed sensitive to national policy, including:
    - Candidates for elections
    - Journalists/Media companies
    - Judges and Government servants
    - Members of the Legislature
    - Political parties or their office-bearers
    - Organisations of a political nature
5. **Exemption for Relatives (2022 Rule Change):** Relaxed the requirement for government intimation for contributions received from relatives abroad, raising the limit from ₹1 lakh to **₹10 lakh**. Non-intimation within 90 days results only in a monetary penalty (5% of the contribution), not prosecution.
6. **Cancellation Grounds:** Empowers the MHA to cancel registration based on violations like false statements, non-activity for two consecutive years, misutilisation of funds, or when deemed necessary in the **"public interest."**

SAHYOG PORTAL

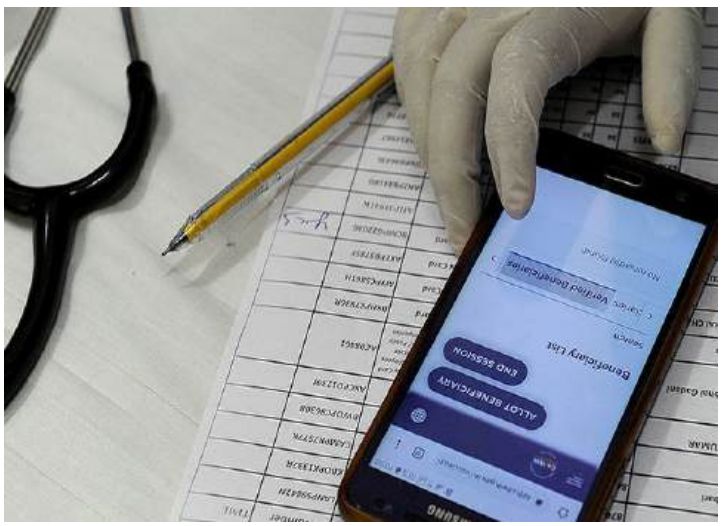
Context:
The Karnataka High Court upheld the Union government's Sahyog portal, dismissing X Corporation's plea that termed it "extra-legal censorship."

About Sahyog Portal:

- **What it is:**
    - An **online regulatory platform** for issuing content takedown notices to internet intermediaries.
    - Developed under **Section 79(3)(b) of the IT Act, 2000**, ensuring prompt removal of unlawful online content.
- **Ministry:**
    - Launched in **October 2024 by the Union Home Ministry**, operated through the Indian Cyber Crime Coordination Centre (I4C).
- **Aim:**
    - To streamline takedown communication between government agencies and digital intermediaries.
    - To preserve safe harbour protections while ensuring intermediaries act quickly against illegal content.
    - To promote a secure, accountable and lawful cyber ecosystem in India.
- **Key Features:**
    - **Centralised Channel**: Connects 65 online intermediaries, state/UT nodal officers, and seven central agencies.
    - **Automated Notices**: Facilitates faster and documented communication of takedown orders.
    - **Legal Backing**: Operates under Section 79(3)(b), where non-compliance removes safe harbour immunity.
    - **Separate from Section 69A**: Unlike blocking powers, it focuses on intermediaries' responsibility to disable unlawful content.
    - **Public Good Tool**: Ensures **immediate action against unlawful data** and strengthens cyber law enforcement.

COWIN PORTAL

Context:
The CoWIN portal, India's flagship digital platform for COVID-19 vaccination records, has been unavailable since early August 2025, blocking access to vaccination certificates.



About CoWIN Portal:

- **What it is?**
  - **CoWIN (COVID Vaccine Intelligence Network)** is a government digital platform for registration, scheduling, tracking, and certification of COVID-19 vaccinations.
  - It serves as an **end-to-end public health management tool** from the national to the vaccinator level.
- **Launched in:** January 2021, during India's COVID-19 vaccination drive.
- **Ministry:** Union Ministry of Health and Family Welfare (MoHFW).
- **Aim:**
  - To provide a **transparent, efficient, and real-time system** for vaccination delivery.
  - To ensure **equitable access, identity verification, tracking of doses, and certification** for every beneficiary.
- **Key Features:**
  - **Five Modules**:
    - Orchestration module (overall management).
    - Vaccination cold-chain module (vaccine logistics).
    - Citizen registration module (self and bulk registration).
    - Vaccinator module (session management).
    - Certificate, feedback & adverse-event reporting module.
  - **Integration:** Accessible through CoWIN website, Aarogya Setu app, UMANG app, and DigiLocker.
  - **Authentication Methods:** OTP, biometric, and demographic authentication.
  - **Real-Time Tracking:** Monitors beneficiaries, vaccine doses, wastage, and coverage at national, state, district, and sub-district levels.
- **Significance:**
  - Enabled **over 2 billion vaccine doses** to be administered and certified digitally.
  - Became a **global model of digital public good**, offered to other countries in 2021.
  - Certificates served as **key documents** for travel, employment, and access to services during the pandemic.

INDIA RANKINGS 2025

Context: The Ministry of Education released the India Rankings 2025 under the National Institutional Ranking Framework (NIRF).

Sl. No.	Parameter	Marks	Weightage
1	Teaching, Learning & Resources	100	0.30
2	Research and Professional Practice	100	0.30
3	Graduation Outcome	100	0.20
4	Outreach and Inclusivity	100	0.10
5	Perception	100	0.10

About India Rankings 2025:

- **What it is?**
  - India Rankings is the annual ranking of higher education institutions based on the **National Institutional Ranking Framework (NIRF)**, introduced in 2015. It covers universities, colleges, and specialized institutions across disciplines.
- **Published by:** The **Ministry of Education, Government of India**, with data support from agencies like Scopus, Web of Science, and Derwent Innovation.
- **Aim:**
  - To promote **accountability, transparency, and quality benchmarking** among Higher Education Institutions (HEIs).
  - To guide students, parents, and policymakers with credible performance indicators.
  - To align higher education with **NEP 2020 goals** and India's vision of becoming a knowledge superpower by 2047.
- **Criteria Used (5 Parameters & Weightage):**
  - **Teaching, Learning & Resources (30%)** – faculty quality, student strength, financial resources.
  - **Research & Professional Practice (30%)** – publications, citations, patents.
  - **Graduation Outcomes (20%)** – placement, higher studies, median salary.
  - **Outreach & Inclusivity (10%)** – gender balance, regional diversity, inclusivity.
  - **Perception (10%)** – academic and public reputation.

- **Trends in Report (2025):** (No need to remember everything just have the idea)
    - **IIT Madras retained dominance** – ranked 1st in the Overall category for the 7th year in a row, and 1st in Engineering for the 10th year.
    - IISc Bengaluru's **consistent lead** – topped Universities for the 10th consecutive year and Research Institutions for the 5th year.
    - **Domain leaders unchanged** – IIM Ahmedabad in Management, AIIMS Delhi in Medical, IIT Roorkee in Architecture, and NLSIU Bengaluru in Law maintained their top positions.
    - **Delhi colleges dominance** – Hindu College secured 1st place for the 2nd year, while six of the top 10 colleges are from Delhi.
    - **Expansion of categories** – 9 categories and 8 subject domains covered; new **SDG-based rankings** introduced, topped by IIT Madras.
    - **Growing participation** – 7,692 unique institutions applied, with 14,163 submissions, reflecting a 297% rise in applications since 2016.
    - **Emerging diversity in leaders** – Jamia Hamdard (Pharmacy), IGNOU (Open Universities), Symbiosis (Skill Universities), and IARI Delhi (Agriculture) highlight non-IIT/non-IIM excellence.

EDUCATE GIRLS WINS 2025 RAMON MAGSAYSAY AWARD

Context:
Educate Girls, an Indian NGO working to bring out-of-school girls into classrooms, has won the 2025 Ramon Magsaysay Award.

- It is the first Indian organisation (not individual) to be honoured with this award, often called the "Asia's Nobel Prize".

About Ramon Magsaysay Award:

- **What it is?**
    - Asia's most prestigious award, given annually for exceptional courage, integrity, and service to people.
- **Established in:** 1957, by the Rockefeller Brothers Fund in memory of Philippine President Ramon Magsaysay (died 1957 in a plane crash).
- **Eligibility:** Individuals and organisations from Asia showing "greatness of spirit in selfless service to the people."
- **Features:** Each awardee receives a medallion with Magsaysay's image, a certificate, and a cash prize.
- **Indian Winners**:
    - Vinoba Bhave (1958) – 1st Winner
    - **In recent years:**
        - **Bezwada Wilson and T.M. Krishna** (2016) - Human Rights; Carnatic Music
        - **Bharat Vatwani and Sonam Wangchuk** (2018) - Restoring Health and Dignity to Troubled Lives; Education for Community Progress
        - **Ravish Kumar** (2019) – Journalism
        - **Dr. Ravi Kannan R.** (2023) - Healthcare
        - **2025 Special Note**: *Educate Girls* became the first Indian organisation to win.

About Educate Girls NGO:

- **Full Name:** Foundation to Educate Girls Globally (popularly *Educate Girls*).
- **Founded in:** 2007 by **Safeena Husain**, a London School of Economics graduate.
- **Aim:** To break the cycle of illiteracy and poverty by mobilising communities and governments to support **girls' education** in rural and disadvantaged areas. Motto: *"One girl at a time."*
- **Functions/Initiatives**:
    - **Community mobilisation**: Identifying out-of-school girls, enrolling and retaining them.
    - **Government partnerships**: Scaling programmes with state support.
    - **Innovative finance**: Launched the world's first **Development Impact Bond (2015)** in education.
    - **Pragati Programme**: Open schooling for young women (15–29 years) to complete secondary education.
    - **Impact**: Now operates across **30,000 villages**, benefitting over **2 million girls**, with >90% retention rate.

International Relations

CENTRAL AMERICAN INTEGRATION SYSTEM (SICA)

Context:
External Affairs Minister S. Jaishankar addressed the India–SICA Foreign Ministers' Meeting.

About Central American Integration System (SICA):

What SICA Is?

- **Name:** Central American Integration System (SICA).
- **Purpose:** The institutional framework designed to govern and facilitate **regional integration** in Central America.
- **Secretariat:** Located in **El Salvador**.
- **Establishment:** Created by the **Tegucigalpa Protocol** (December 13, 1991), which updated the older ODECA Charter.
- **Operation Date:** Became fully operational on **February 1, 1993**.
- **International Status:** Recognized by the **UN General Assembly** (Resolution A/48 L, 1993).

Membership:

- **Founding States (6):** Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, Panama.
- **Later Members (2):** Belize, Dominican Republic.
- **Extra-Regional Observers:** Includes the EU, UK, Spain, Germany, Japan, South Korea, and **India** (a designated partner).

Aims:

- **Stability:** Achieve and consolidate **peace, liberty, democracy**, and overall development.
- **Governance:** Promote **human rights** and the **rule of law**.
- **Economy:** Progress from a Free Trade Area toward a fully realized **Customs Union**.
- **Cohesion:** Develop regional **infrastructure**, a unified **visa/passport** system, and common global positions.

Functions:

- **Leadership:** Hosts **Biannual Summits** with the presidency rotating every six months.
- **Coordination:** Aligns policies on trade, the customs union, climate action, food security, and energy cooperation.
- **Diplomacy:** Facilitates collective diplomacy to align members on global forums.

Importance for India:

- **Partnership:** Serves as a strategic platform for South–South cooperation on shared challenges (poverty, development, climate change).
- **Economy:** Offers economic opportunities for Indian expertise in agriculture, renewable energy, pharma, IT, and digital payments (e.g., the UPI model).

SHANGHAI COOPERATION ORGANISATION (SCO) SUMMIT, 2027

Context:
Pakistan Prime Minister Shehbaz Sharif announced that Pakistan will host the Shanghai Cooperation Organisation (SCO) Summit in 2027 and has directed authorities to begin preparations in Islamabad.

- The next SCO summit is scheduled to take place in **2026 in Bishkek.**

Shanghai Cooperation Organization

About Shanghai Cooperation Organisation (SCO) Summit, 2027:

- **What it is?**
  - A **permanent intergovernmental regional organisation** focusing on political, economic, and security cooperation in Eurasia.
  - Known for promoting the "**Shanghai Spirit**" — mutual trust, benefit, equality, and peaceful coexistence.
- **Establishment & Headquarters:**
  - **Established:** June 15, 2001, in Shanghai, China.

- **Charter Signed:** 2002 (St. Petersburg), entered into force on **19 September 2003**.
- **Headquarters:** Beijing, China.
- **RATS (Regional Anti-Terrorist Structure):** Located in Tashkent, Uzbekistan.

- **Origin & Evolution:**
  - Evolved from the **Shanghai Five Mechanism** (China, Russia, Kazakhstan, Kyrgyzstan, Tajikistan – 1996) aimed at resolving border issues and building regional trust.
  - Expanded into a multi-sectoral organisation with strong focus on **security, counter-terrorism, and connectivity**.
- **Membership:**
  - **10 Full Members:** China, Russia, India, Pakistan, Kazakhstan, Kyrgyzstan, Tajikistan, Uzbekistan, Iran, Belarus (latest).
  - **2 Observer States:** Afghanistan, Mongolia.
- **Annual Rotation:**
  - The **Chairmanship of the SCO rotates annually** among member states, following the **Russian alphabetical order of country names**.
  - The member holding the Chairmanship hosts the **Council of Heads of State (CHS) Summit** that year.
- **Key Functions & Activities:**
  - **Regional Security:** Counter-terrorism operations, intelligence sharing, and RATS coordination.
  - **Economic Cooperation:** Promotes trade, investment, energy security, and connectivity (e.g., SCO Business Council, SCO Development Bank proposals).
  - **Cultural & Educational Ties:** Youth exchange programs, sports, culture festivals, scholarships.
  - **Multilateral Diplomacy:** Acts as a platform for member states to coordinate on Afghanistan, climate action, and Eurasian stability.
  - **Annual Summits:** Council of Heads of State (CHS) is the supreme decision-making body; CHG (PM-level) meets annually to approve budgets and priorities.

THE U.K. INDIA INFRASTRUCTURE FINANCING BRIDGE (UKIIFB)

Context:
The U.K. India Infrastructure Financing Bridge (UKIIFB), launched in September 2024, marked its first anniversary with a report in London recommending policy changes to de-risk investments in India's infrastructure sector.

About The U.K. India Infrastructure Financing Bridge (UKIIFB):

- **What it is?**
  - A bilateral initiative between India and the U.K. to mobilise global private capital for India's sustainable infrastructure projects.
- **Launched in:** September 2024 during the India–UK Economic and Financial Dialogue.
- **Organisations Involved:** NITI Aayog (lead institution) and City of London Corporation (lead institution).
- **Objectives:**
  - Accelerate mobilisation of international private sector investments in India's infrastructure.
  - Align Indian procurement with global best practices (e.g., UK's Five Case Model).
  - Ensure adherence to global ESG standards.
  - Address barriers like revenue risks, repatriation challenges, and taxation issues.
- **Functions:**
  - Provide policy recommendations to improve transparency, predictability, and competitiveness of Indian projects.
  - Develop knowledge and best practices for sustainable infrastructure financing.
  - Facilitate joint planning and structuring of projects (e.g., highways, rapid transport, renewable energy).
  - Focus on climate-resilient and green finance models.
- **Significance:**
  - **For India:** Mobilises part of the $2 trillion infrastructure investment needed by 2030, boosts mid-sized firms' participation, and attracts long-term capital.
  - **For U.K.:** Expands financial services and green finance leadership in a high-growth market.

INDIA AND ISRAEL SIGN BILATERAL INVESTMENT AGREEMENT (BIA)

Context:
India and Israel signed a Bilateral Investment Agreement (BIA) in New Delhi, witnessed by Finance Ministers of India and Bezalel Smotrich.

About India and Israel sign Bilateral Investment Agreement (BIA):

- **What it is?**
  - A landmark **investment protection and promotion treaty** between India and Israel.
  - Provides a **minimum standard of treatment** and a framework for transparent, secure, and fair investment flows.
  - Establishes a **neutral dispute resolution mechanism through arbitration** to protect investors.
- **Aim:**
  - Facilitate **greater certainty, transparency, and security** for investors in both countries.
  - Safeguard investments against risks like expropriation, arbitrary restrictions, or policy shocks.
  - Encourage **mutual trade and capital flows**, making investment environments more resilient.
  - Balance **investor protection** with sovereign **regulatory rights** of the two governments.
- **Key Agreements:**
  - **Protection from Expropriation:** Ensures fair compensation if assets are seized or nationalised.
  - **Transparency Measures:** Clear rules and open procedures to promote investor confidence.
  - **Independent Arbitration:** Neutral dispute settlement mechanism outside domestic courts.
  - **Free Transfer & Compensation:** Smooth repatriation of capital, profits, and compensation for losses.
  - **Sectoral Cooperation:** Enhanced collaboration in fintech, infrastructure, digital payments, cybersecurity, defence, and high-tech innovation.

Current Affairs

L-1 VISA

Context:

The U.S. administration under Donald Trump announced a $100,000 fee hike on fresh H-1B applications, sparking debate on whether the L-1 visa could be an alternative for Indian professionals.

About L-1 Visa:

- **What it is?**
  - Two types: **L-1A** employees (executives/ managers) and **L-1B** (specialized knowledge A **non-immigrant work visa** for **intra-company transfers**.
  - Allows multinational firms to send employees from overseas branches to their U.S. offices.
- **Origin:**
  - Created under the **Immigration and Nationality Act (1965)** framework.
  - Designed to support global operations of multinational corporations.
- **Aim:**
  - To **facilitate transfer of talent** within the same company across borders.
  - Strengthen U.S. business operations without relying on external labour markets.
- **Features:**
  - No **annual cap or lottery system**, unlike H-1B.
  - Allows **dual intent** – holders can apply for a green card without affecting visa status.
  - Spouses (L-2 visa) can **work without restriction** in the U.S.
  - **Maximum stay:** 5 years (L-1B), 7 years (L-1A).
  - Companies can use **blanket petitions** for faster processing.
- **Limitations:**
  - **Eligibility narrow**: Employee must have worked abroad for the same company for at least **1 continuous year in the last 3 years**.
  - **High scrutiny**: Especially in India, rejection rates are higher due to "specialized knowledge" being vaguely defined.
  - **Time-bound**: Fixed maximum stay; cannot extend indefinitely while awaiting green card.
  - **No flexibility**: Employees cannot switch to another U.S. employer.

ONE-IN, ONE-OUT SCHEME

Context:

An Indian national became the first person deported from the UK to France under the newly implemented 'one-in, one-out' scheme of the UK–France returns treaty.

About One-In, One-Out Scheme:

What It Is?

- A **bilateral migration and deportation arrangement** between the **United Kingdom and France**.
- Allows the UK to **return illegal migrants who arrived via the English Channel** back to France.

Nations Involved: United Kingdom (UK) and France

Aim:

- Deter illegal small-boat crossings across the English Channel.
- Break the network of human smugglers and trafficking gangs.
- Ensure safe, legal, and managed migration routes for genuine asylum seekers.

Key Features:

- **Reciprocal Mechanism:** For every migrant France takes back, UK agrees to accept a legal asylum seeker from France (hence "one-in, one-out").
- **Pilot Scheme:** Effective **August 2025 – June 2026**, subject to review.
- **Fast-Track Deportations:** Shortens legal process for removing illegal entrants.
- **Voluntary Return Option:** Deported migrants may accept **funded voluntary return** to home country.
- **Court Oversight:** UK courts can hear last-minute appeals but must act swiftly.

Significance:

- **Border Security:** Strengthens UK's ability to deter illegal migration and secure its coastline.
- **International Cooperation:** Showcases cross-border collaboration on migration crisis management.
- **Political Messaging:** Sends strong deterrent signal to migrants and smuggling networks

UNIVERSAL POSTAL UNION (UPU)

Context:

India has been re-elected to the Council of Administration (CA) and the Postal Operations Council (POC) of the Universal Postal Union (UPU) during the 28th UPU Congress held in Dubai.

About Universal Postal Union (UPU):

- **What It Is?**
  - UPU is a **specialized agency of the United Nations** and the **primary forum for international postal cooperation**.
  - It ensures a **universal postal network** connecting 192 member nations.
- **Founded:** 1874 (Treaty of Bern).
- **Headquarters:** Berne, Switzerland.
  - **Second oldest international organization** after the International Telecommunication Union (ITU).
- **Aim:**
  - Promote **global postal cooperation** and ensure smooth international mail exchanges.
  - Develop modern, reliable, affordable postal services worldwide.
  - Facilitate growth in parcel, mail, and postal financial services.
- **Governance Structure:**
  - UPU has **4 key bodies**:
    - **Congress:** Supreme authority, meets every 4 years, sets strategy & policies.
    - **Council of Administration (CA):**

Deals with policy, regulatory, legal, administrative issues between Congress sessions.

- **Postal Operations Council (POC):** Technical & operational body (48 elected members) driving postal service modernization.
- **International Bureau:** Secretariat providing logistical and technical support.

- **Key Functions:**
  - **Rule-Setting:** Defines global postal regulations and standards.
  - **Advisory & Mediation Role:** Resolves disputes, promotes cooperation.
  - **Technical Assistance:** Helps countries modernize postal services.
  - **Capacity Building:** Recommends measures for improving quality, efficiency, and financial sustainability of postal services.
  - **Global Integration:** Ensures interoperability and growth of e-commerce and cross-border logistics.

POWER OF SIBERIA 2 PIPELINE

Context:

Russia's Gazprom signed a deal with China National Petroleum Corporation (CNPC) to build the Power of Siberia 2 pipeline.

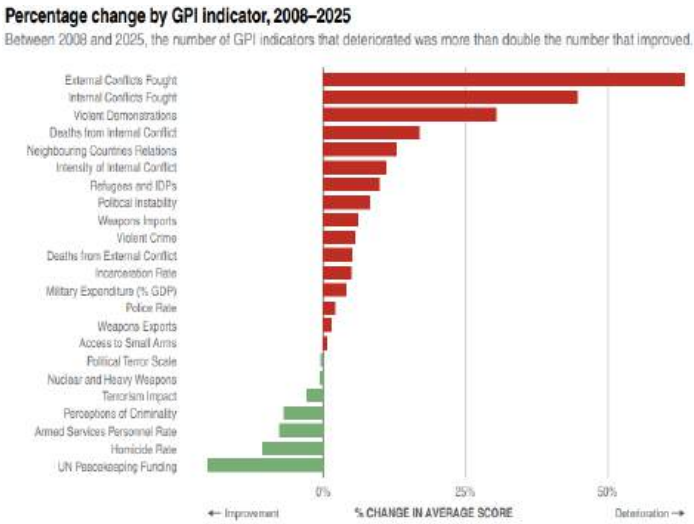
About Power of Siberia 2 Pipeline:

- **What it is?**
  - A proposed **natural gas pipeline project** connecting western Siberia (Russia) to China via Mongolia.
  - Expansion of the earlier **Power of Siberia 1 pipeline** (operational since 2019).
- **Nations Involved:**
  - Runs through **Russia → Mongolia → China**, covering ~6,700 km.
- **Aim:**
  - To replace lost European gas revenue after EU sanctions and Russia's cutoff following the Ukraine war.
  - To strengthen Russia–China energy cooperation and reduce dependence on Western markets.
- **Features:**
  - **Length:** The pipeline will be about **6,700 km long**, starting from Russia's **Yamal Peninsula**, passing near **Lake Baikal**, through **Mongolia**, and finally reaching **China**.
  - **Capacity:** It will be able to carry around **50 billion cubic metres of gas every year**.
  - **Comparison:**
    - Earlier, Russia used to send up to 180 billion cubic metres of gas every year to Europe. The first pipeline to China (Power of Siberia 1) carries 38 billion cubic metres per year.
    - Power of Siberia 2 is big, but still much smaller than Europe's old demand.

THE GLOBAL PEACE INDEX (GPI) 2025

Context:

The Global Peace Index (GPI) 2025 ranked Iceland as the most peaceful country, while India stood at 115th out of 163 nations, reflecting a modest improvement in its peace score.



About The Global Peace Index (GPI) 2025:

What it is?

- An **annual ranking** of countries on peacefulness.
- Covers **163 states and territories**, representing 99.7% of the world's population.

Published by:

- The **Institute for Economics and Peace (IEP)**, an international think tank headquartered in Sydney, Australia.

Criteria:

- GPI assesses countries on **23 indicators** across 3 broad domains:
    1. **Societal Safety & Security** (crime rates, political stability, refugee impact).
    2. **Ongoing Domestic & International Conflict** (war, terrorism, civil unrest).
    3. **Militarisation** (military expenditure, weapons imports/exports, armed personnel).

Trends and Rankings (2025):

- **Top performers**: Iceland (1st), followed by **Ireland, New Zealand, Finland, Austria, Switzerland, Singapore, Portugal, Denmark, Slovenia**.
- **Least peaceful**: Russia, Ukraine, Sudan, DR Congo, Yemen.
- **Regional trends:**
    - **Europe** dominates the top 10.
    - **South America** showed improvements (Argentina, Peru).
    - **Sub-Saharan Africa & Middle East** remain least peaceful.
    - Global average peacefulness **declined** due to internal conflicts, militarisation, and geopolitical divides.

India & GPI 2025:

- India ranked **115th** with a score of **2.229**, an improvement of **0.58% over last year**.
- **Factors behind improvement:** gradual decline in domestic violence & disputes, better societal stability.
- **Challenges:** high militarisation, cross-border tensions, and sporadic internal unrest.

FACTS FOR PRELIMS GENERAL STUDIES – 3

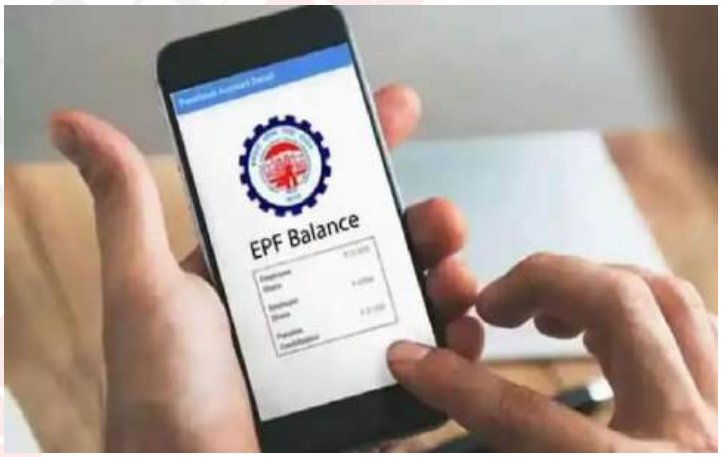
ECONOMY

Human Development (Poverty, Inequality and Unemployment)

EPFO PASSBOOK LITE

Context:

The Employees' Provident Fund Organisation (EPFO) has launched "Passbook Lite", a simplified PF balance view on its member portal.



About EPFO Passbook Lite:

What It Is?

- A **new facility within EPFO's Member Portal** providing a quick, summarised snapshot of PF contributions, withdrawals, and balance — without logging in to the separate passbook portal.

Launched By: Union Labour & Employment Minister, on behalf of EPFO.

Aim:

- To simplify access to PF information, reduce login delays, enhance transparency, and improve member satisfaction.

Key Features:

- **Single Login:** No need to log in to a separate passbook portal.
- **Quick Snapshot:** Shows contributions, withdrawals, and current balance at a glance.
- **Faster Access:** Reduces load on main portal, leading to quicker response times.
- **Detailed View Option:** Full passbook still available for those needing comprehensive data.

- **Integrated with Transfer Tracking:** Members can check PF transfer status and download Annexure K.

Significance:

- **Improves Transparency:** Members can instantly verify employer contributions and transfers.
- **Reduces Grievances:** Eliminates delays and password sync issues from dual login.
- **Boosts Digital Inclusion:** Over 2.7 crore users gain seamless access to PF data.

Financial Markets (Capital Market, Money Market)

HSBC–IBM QUANTUM-ENABLED ALGORITHMIC TRADING

Context:

HSBC and IBM announced the world's first quantum-enabled algorithmic bond trading trial.

About HSBC–IBM Quantum-Enabled Algorithmic Trading:

What It Is?

- The trial is the **world's first-known empirical evidence** of using a **hybrid quantum-classical computing approach** to solve a real-world problem in algorithmic bond trading.
- It involved **HSBC** and **IBM**, using real, production-scale trading data from the **European corporate bond market**.

Features:

- **Hybrid Approach:** The teams utilized a combination of quantum and classical computing resources, rather than quantum computers alone.
- **Quantum Augmentation:** The IBM Heron quantum processor was used to augment classical computing workflows.

About Algorithmic Trading (Algo Trading):

What It Is?

- **Algorithmic trading** is the use of computer programs to automatically execute buy or sell orders for securities (like stocks, bonds, futures, or options) based on a **predefined set of rules**. These rules or criteria are coded based on factors like price, time, volume, or technical indicators.

How It Works:

- **Strategy Definition:** A trading strategy is designed using technical indicators, historical data, and quantitative models.

  E.g., "Buy 100 shares if the 5-minute moving average crosses above the 20-minute moving average".
- **Coding:** The strategy logic is converted into an automated computer code (often in Python, Java, or C++).
- **Data Feed:** The algorithm connects to a **live data feed** to continuously monitor market prices and conditions.
- **Execution:** When the **predefined criteria** are met, the algorithm automatically triggers and sends the order to the broker/exchange in milliseconds, with **zero human intervention**.

Key Features and Benefits:

- **Speed:** Executes trades in milliseconds, capturing fleeting price differences.
- **Reduced Emotion:** Removes human emotional biases (fear, greed) from trading decisions, ensuring consistency.
- **Consistency:** Adheres strictly to the pre-programmed rules every time.
- **Scalability:** Allows a trader to run and monitor multiple strategies and asset classes simultaneously.
- **Backtesting:** Enables strategies to be tested on historical data before live deployment.

Algorithmic vs. Manual Trading:

Feature	Algorithmic Trading	Manual Trading
Speed	Trades executed in **milliseconds**; ultra-fast.	Trades executed in seconds/minutes; limited by human speed.
Emotions	**Zero emotional intervention**; purely logic-based.	Susceptible to human emotions (fear, greed).
Consistency	Highly **consistent**; follows rules exactly.	Varies based on trader's mood or market sentiment.
Scalability	Can manage **multiple strategies** and assets simultaneously.	Challenging to monitor and analyse multiple symbols at once.

SEBI Rules on Algo Trading (India):

- Recognised since 2008 and NSE introduced co-location & smart order routing (2011).
- **SEBI now mandates:**
  - All algo strategies must be approved by exchanges and assigned unique IDs.

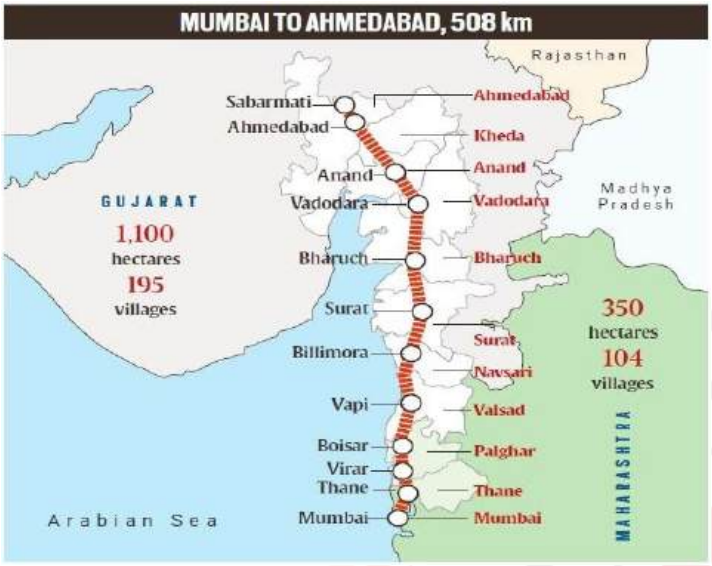
- Brokers responsible for risk controls, audit trails, and client consent.
- Discourages unauthorised third-party black-box algos.

Industry and Infrastructure

MUMBAI–AHMEDABAD HIGH-SPEED RAIL (MAHSR) CORRIDOR

Context:

A 4.88 km tunnel breakthrough between Ghansoli and Shilphata was achieved, marking a critical milestone for the Mumbai–Ahmedabad High-Speed Rail (MAHSR) corridor.



About Mumbai–Ahmedabad High-Speed Rail (MAHSR) Corridor:

- **What It Is?**
  - The Mumbai–Ahmedabad High-Speed Rail (MAHSR) is **India's first bullet train project**, covering 508 km between Mumbai (Maharashtra) and Ahmedabad (Gujarat).
  - It uses **Japanese Shinkansen technology** with trains running at 320 kmph, drastically cutting travel time to just over 2 hours.
- **Implemented by:** National High-Speed Rail Corporation Limited (NHSRCL) with Japanese technical and financial assistance.
- **Key Features of Mumbai–Ahmedabad High-Speed Rail (MAHSR) Corridor:**
  - **Route (508 km):** Covers **348 km in Gujarat, 156 km in Maharashtra, 4 km in Dadra & Nagar Haveli**, ensuring regional connectivity and balanced development.
  - **Stations (12 total):** Includes major stops like **Mumbai BKC, Thane, Surat, Vadodara, Ahmedabad**, integrating economic hubs and improving intercity travel efficiency.
  - **Speed (320 kmph):** Operational speed of **320 kmph (design speed 350 kmph)** reduces Mumbai–Ahmedabad travel time from 6–7 hours to just over 2 hours.
  - **Infrastructure:** Features a **21 km tunnel** (including 7 km undersea section), 320 km viaducts, 17 river bridges, 9 steel bridges — showcasing world-class engineering.
  - **Technology:** Employs **Japanese Shinkansen (E5/E10 series)** with advanced signalling, automatic train control, and high safety standards, ensuring global-class service.
- **Significance:**
  - **Economic Impact:** Generates jobs, boosts construction & manufacturing ecosystem.
  - **Technology Transfer:** Brings Japanese HSR tech, signalling systems, and skill development to India.
  - **Regional Growth:** Improves connectivity, promotes urbanization & economic integration between Maharashtra and Gujarat.

LOGISTICS EASE ACROSS DIFFERENT STATES (LEADS) 2025

Context:

Union Commerce & Industry Minister launched Logistics Ease Across Different States (LEADS) 2025 in New Delhi during the decade-long celebrations of Make in India.

About Logistics Ease Across Different States (LEADS) 2025:

- **What it is?**
  - LEADS is a **national index and survey** that ranks and assesses the logistics ecosystem of Indian States and UTs, identifying gaps and best practices to enhance supply chain performance.
- **Ministry:** Released by the **Ministry of Commerce and Industry**, Department for Promotion of Industry and Internal Trade (DPIIT).
- **Aim:**
  - To benchmark logistics performance of States/UTs.

- To lower logistics costs and improve efficiency.
- To guide States/UTs in infrastructure planning, policy reforms, and capacity building.

- **Assessment Criteria:**
  - **Infrastructure Quality:** Roads, warehousing, multimodal connectivity.
  - **Services:** Availability, quality, and reliability of logistics services.
  - **Efficiency:** Timeliness, truck turnaround time, ease of clearances.
  - **Policy Support:** State-level facilitation measures, grievance redressal mechanisms.
  - **Stakeholder Perception:** Industry feedback on cost, speed, and reliability.
- **Key Features of LEADS 2025:**
  - **Corridor Performance Tracking:** Assessment of 5–7 key national corridors using journey time, truck speed, and waiting time.
  - **API-Enabled Data:** Real-time section-wise speed evaluation on major road corridors for sharper analytics.
  - **State Rankings & Categories:** Leaders, Achievers, and Aspirers classification for healthy competition.
  - **Policy Recommendations:** Tailored state-level interventions based on findings.
  - **Digital Dashboard:** Interactive platform for States/UTs to monitor performance continuously

INDIA & FAO JOIN HANDS TO BUILD WORLD-CLASS BLUE PORTS

Context:
India's Department of Fisheries (DoF) and the FAO have signed a Technical Cooperation Programme (TCP) to develop world-class Blue Ports.

About India & FAO Join Hands to Build World-Class Blue Ports:

What It Is?

- A collaborative initiative under FAO's TCP to **upgrade fishing ports** into **smart, sustainable, and inclusive Blue Ports**, ensuring economic growth and ecological protection.

Organisations Involved:

- Department of Fisheries (DoF), Ministry of Fisheries, Animal Husbandry & Dairying (MoFAHD), Government of India.
- Food and Agriculture Organization (FAO) of the United Nations.

Aim:

- Modernise fishing harbour infrastructure, boost post-harvest efficiency, ensure traceability, and promote **climate-resilient, tech-driven fisheries value chains**.
- Enhance **food and nutritional security**, strengthen export competitiveness, and empower coastal communities.

Features of Blue Ports:

- **Smart Technology Integration:** IoT sensors, AI, 5G, automation, satellite communication, real-time data analytics.
- **Eco-Friendly Infrastructure:** Rainwater harvesting, energy-efficient lighting, electric equipment, robust waste management & sewage treatment systems.
- **Climate Resilience:** Pollution control, debris clean-up systems, energy transition in port operations.

About Blue Port Framework:

- **What It Is?**
  - A flagship initiative of the Department of Fisheries (DoF) under the Ministry of Fisheries, Animal Husbandry & Dairying.
  - Supported under the **Pradhan Mantri Matsya Sampada Yojana (PMMSY)** and backed by the FAO's Technical Cooperation Programme.
- **Features:**
  - **Technological Integration:** IoT devices, sensor networks, satellite communications, data analytics for real-time monitoring.
  - **Eco-Friendly Design:** Rainwater harvesting, energy-efficient lighting, electric equipment, waste and sewage treatment facilities.
  - **Operational Efficiency:** Digital platforms for harbour management, traceability, and faster fish handling.
  - **Social Inclusion:** Safer working conditions, women-friendly infrastructure, stakeholder participation.
  - **Pilot Harbours:** Vanakbara (Diu), Jakhau

(Gujarat), and Karaikal (Puducherry) with ₹369.8 crore investment.

Significance:

- **Boosts Blue Economy:** Strengthens fisheries sector, improves exports and incomes of fisherfolk.
- **Supports PMMSY Goals:** Aligns with Pradhan Mantri Matsya Sampada Yojana for modern harbour infrastructure.
- **Environmental Stewardship:** Reduces marine pollution and supports sustainable fishing practices.

BAIRABI–SAIRANG RAILWAY LINE

Context:

Prime Minister of India inaugurated the Bairabi–Sairang Railway Line, giving Mizoram's capital Aizawl direct rail connectivity for the first time.

About Bairabi–Sairang Railway Line:

- **What it is?**
  - A **51.38 km broad-gauge railway line** connecting Bairabi (railhead on Assam border) to Sairang (near Aizawl).
  - This is part of Indian Railways' **North East connectivity mission** under the "Act East" policy.
- **Origin:**
  - Project sanctioned under the **Indian Railways Vision 2020**.
  - Construction started in phases, with the last section Hortoki–Sairang commissioned in **June 2025** after CRS safety clearance.
- **Objective:**
  - Provide **direct rail access to Aizawl**, reducing travel time and logistics cost.
  - Improve **freight connectivity** for essential goods, boosting trade and regional integration.
  - Fulfil **long-standing socio-economic demand** of Mizoram under "Transformation of North East (TONE)" programme.
- **Key Features:**
  - **Cost:** ₹8,000 crore project.
  - **Engineering Marvel:** 48 tunnels (12.85 km total), 55 major and 87 minor bridges.
  - **Bridge No. 196:** 104 m tall — taller than Qutub Minar by 42 m.
  - **Four Sections:** Bairabi–Hortoki, Hortoki–Kawnpui, Kawnpui–Mualkhang, Mualkhang–Sairang.
  - 5 road overbridges, 6 road underbridges for smooth traffic movement.
  - Passenger trains designed for **100 kmph speed**.
- **Significance:**
  - **Regional Integration:** First direct rail link to Mizoram's capital — enhances Centre's Act East Policy.
  - **Economic Growth:** Boosts trade, tourism, agri-produce movement, and industrial access.
  - **Social Impact:** Improves healthcare, education access and emergency mobility.

THE U.K. INDIA INFRASTRUCTURE FINANCING BRIDGE (UKIIFB)

Context:

The U.K. India Infrastructure Financing Bridge (UKIIFB), launched in September 2024, marked its first anniversary with a report in London recommending policy changes to de-risk investments in India's infrastructure sector.

About The U.K. India Infrastructure Financing Bridge (UKIIFB):

- **What it is?**
  - A bilateral initiative between India and the U.K. to mobilise global private capital for India's sustainable infrastructure projects.
- **Launched in:** September 2024 during the India–UK Economic and Financial Dialogue.
- **Organisations Involved:** NITI Aayog (lead institution) and City of London Corporation (lead institution).

- **Objectives:**
  - Accelerate mobilisation of international private sector investments in India's infrastructure.
  - Align Indian procurement with global best practices (e.g., UK's Five Case Model).
  - Ensure adherence to global ESG standards.
  - Address barriers like revenue risks, repatriation challenges, and taxation issues.
- **Functions:**
  - Provide policy recommendations to improve transparency, predictability, and competitiveness of Indian projects.
  - Develop knowledge and best practices for sustainable infrastructure financing.
  - Facilitate joint planning and structuring of projects (e.g., highways, rapid transport, renewable energy).
  - Focus on climate-resilient and green finance models.
- **Significance:**
  - **For India:** Mobilises part of the $2 trillion infrastructure investment needed by 2030, boosts mid-sized firms' participation, and attracts long-term capital.
  - **For U.K.:** Expands financial services and green finance leadership in a high-growth market.

External Sector and International Institutions (BOP, FDI, FII, Capital Account, Currency Devaluation, Depreciation, IMF, WB)

SPECIAL AND DIFFERENTIAL TREATMENT (SDT)

Context:

China announced it will no longer seek new "special and differential treatment" (S&DT) at WTO talks, marking a shift in its trade stance.

About Special and Differential Treatment (S&DT):

What It Is?

- **S&DT provisions** are special rights in WTO agreements that grant developing and least-developed countries (LDCs) flexibility in implementing trade commitments.
- They provide longer transition periods, softer obligations, and greater policy space compared to developed countries.

Origin:

- Introduced under **GATT (1960s)** through the "Enabling Clause" (1979) recognising the development needs of poorer nations.
- Consolidated in the **WTO Agreements (1995)** and reinforced in the **Doha Development Agenda (2001)**.

Aim:

- To **level the playing field** in global trade by addressing structural disadvantages of developing economies.
- To ensure that trade liberalisation does not undermine **domestic development priorities**.

Key Features:

1. **Longer Implementation Periods**: Developing nations get extended deadlines to comply with WTO obligations.
2. **Market Access Support**: Developed members provide tariff concessions, preferential treatment (e.g., GSP schemes).
3. **Safeguard Measures**: Members must consider the trade interests of developing countries in policy design.
4. **Capacity Building**: Technical assistance, training, and dispute-handling support provided to weaker economies.
5. **Special Provisions for LDCs**: Duty-free, quota-free market access and exemptions from strict obligations.

How Developed and Developing Country Status Is Decided in WTO?

- **No Fixed Definition:**
  - WTO has **no formal definition** of "developed" or "developing" countries.
  - Members **self-declare** their status at the time of joining or during negotiations.
- **Self-Selection Principle:**
  - A country can **announce itself as developing** to avail benefits of Special and Differential Treatment (S&DT).
  - However, this **declaration is not automatic** and other WTO members can **challenge** or **contest** it if they feel it is misused.
  - **No specific criteria exist:** WTO has no fixed definition of "developed" or "developing"; members self-declare their status.
- **Special Category – LDCs:**

- **Least Developed Countries (LDCs)** are not self-declared.
- UN defines LDCs using criteria like **GNI per capita, human assets, and economic vulnerability**.
- WTO automatically grants **extra flexibilities** to LDCs (longer transition, preferential access, etc.).

WTO AGREEMENT ON FISHERIES SUBSIDIES

Context:

WTO Agreement on Fisheries Subsidies has entered into force after crossing the two-thirds acceptance threshold with recent ratifications by Brazil, Kenya, Viet Nam, and Tonga.

- It is the first WTO agreement focused on environmental sustainability, targeting illegal and harmful fishing subsidies to protect marine resources.

About WTO Agreement on Fisheries Subsidies:

- **What it is?**
  - A binding multilateral agreement under the aegis of the World Trade Organization (WTO).
  - Designed to curb harmful government subsidies that encourage overfishing and depletion of marine stocks.
- **Under the Aegis of:**
  - Negotiated and adopted at the **WTO's 12th Ministerial Conference (MC12)** in **June 2022**, Geneva.
- **Objectives:**
  - **Prevent Overexploitation:** Prohibit subsidies that contribute to overfishing and overcapacity.
  - **Ensure Food Security:** Secure livelihoods of millions dependent on fisheries for nutrition and income.
  - **Promote Fair Trade:** Create a level playing field by disciplining subsidies that distort competition.
- **Key Features:**
  - **Subsidy Prohibitions:** Bans subsidies for illegal, unreported, and unregulated (IUU) fishing, fishing of overfished stocks, and fishing on unregulated high seas.
  - **Transparency Mechanism:** Members must notify subsidies and fishing activities for monitoring.
  - **Implementation Support:** Establishment of **WTO Fish Fund** ($18+ million pledged) to aid developing countries and LDCs.
  - **Committee on Fisheries Subsidies:** Regular dialogue, compliance review, and technical assistance.
  - **Multilateral Milestone:** First WTO agreement focused on environmental sustainability and ocean governance.
- **Significance:**
  - **Global Marine Protection:** Helps address the fact that **35.5% of global fish** stocks are overfished.
  - **Economic Equity:** Reduces unfair advantage of heavily subsidised fleets from large fishing nations.
  - **Support to Small Fishers:** Protects livelihoods of **hundreds of millions** dependent on artisanal fisheries

Public Finance (Fiscal Policy and Budget, Taxation)

GST 2.0

Context:

The Government rolled out GST 2.0 from September 22, 2025, termed the "GST Bachat Utsav" by Prime Minister of India.

- The reform rationalises tax slabs, cuts rates on over 375 items, and simplifies compliance to boost consumption and investment.

About GST 2.0:

What it is?

- A major **tax reform under the Goods and Services Tax (GST) regime** introduced in 2017.
- Focuses on **rate rationalisation, consumer relief, and compliance simplification**.

Aim:

- To **leave more disposable income** with households → spur consumption.
- To **reduce litigation** by aligning similar goods in same tax slab.

Features of the New System:

- **Rate Rationalisation** – Shift to broad **two-slab structure**: 5% (merit rate) and 18% (standard rate) and 40% (demerit goods).
- **Consumer Relief** – Tax exemptions/reductions on food items, life & health insurance, and beauty/ wellness services.
- **Simplified Compliance** – Tech-driven registration, pre-filled returns, automated refunds (90% provisional refund in IDS cases).
- **Correction of IDS** – Placing related goods in same slab to reduce input-output tax mismatch.
- **Boost to Industry** – Encourages investment by cutting costs, particularly in textiles, agriculture, construction, and services.

Important Slab Changes:

- **0.25%** – Rough diamonds, precious stones.
- **1.5%** – Cut & polished diamonds.
- **3%** – Precious metals (gold, silver, pearls).
- **5%** – **516 items:** food, agricultural machinery, medical devices, hydrogen vehicles, health & life insurance, salons.
- **18%** – **640 items:** machinery, chemicals, paints, automobile parts, small cars/bikes.
- **40% (Demerit Rate)** – Sin goods like pan masala, tobacco, aerated beverages, luxury yachts, private aircraft, big cars/bikes.
- **Special Case** – Bricks continue under **6% (no ITC) / 12% (with ITC)** scheme.

GST COUNCIL APPROVES 2-SLAB STRUCTURE

Context:

The GST Council, in its 56th meeting, approved a two-slab GST structure of 5% and 18% with a special 40% rate for sin and luxury goods.

About GST Council Approves 2-Slab Structure:

- **What is GST Council?**
  - A **constitutional body** under Article 279A of the 101st Constitutional Amendment Act, 2016.
  - Recommends GST rates, exemptions, laws, and principles of levy.
- **Members:**
  - Union Finance Minister → **Chairperson**
  - Union Minister of State for Finance/Revenue
  - Finance/Taxation Ministers of all States/UTs
  - In special cases, a Governor-nominated representative (if President's Rule is imposed).
- **Quorum (Minimum Presence):**
  - At least **50% of total members** must be present.
- **Voting Procedure:**
  - **Consensus preferred**, but if voting is required:
    - Union Govt. → **1/3rd weightage**
    - All States/UTs combined → **2/3rd weightage**
    - Decision passes if **≥75% weighted votes** are in favour.
- **Functions:**
  - Recommend GST rates, exemptions, threshold limits.
  - Address inverted duty structure issues.
  - Suggest model GST laws & amendments.
  - Decide special rates during natural disasters.
  - Ensure harmonisation of GST across Centre & States.

About Two-Slab GST Structure:

- **What it is?**
  - Rationalisation of GST into **two main slabs: 5% & 18%**, plus a **special 40% rate** for sin/ luxury goods.
- **Aim:**
  - Simplify GST structure for ease of business & compliance.
  - Reduce cost burden on consumers.
  - Ensure equity by taxing essential goods

lower and luxury/sin goods higher.
  - Improve revenue buoyancy and plug leakages.

PRADHAN MANTRI GARIB KALYAN ANNA YOJANA (PMGKAY)

Context:

The Centre is reviewing the Pradhan Mantri Garib Kalyan Anna Yojana (PMGKAY) to cut subsidy costs by removing ineligible beneficiaries, as the food subsidy bill has crossed ₹2 lakh crore in FY26.

About *Pradhan Mantri Garib Kalyan Anna Yojana (PMGKAY):*

What it is?

- A **free foodgrain distribution scheme** under the **National Food Security Act (NFSA), 2013**.
- Provides rice/wheat free of cost to eligible households through the **Public Distribution System (PDS)**.

Launched in:

- **March 2020**, during the COVID-19 pandemic, as a relief measure for vulnerable populations.

Ministry:

- Implemented by the **Ministry of Consumer Affairs, Food and Public Distribution**.

Aim:

- To ensure **food and nutritional security** of the poor and vulnerable.
- To **mitigate hardships** during crises like the pandemic and economic shocks.
- To uphold the principle of **equity and inclusion** under NFSA.

Components:

- **Antyodaya Anna Yojana (AAY)** households – 35 kg foodgrains per family per month.
- **Priority Households (PHH)** – 5 kg rice/wheat per person per month.
- Distribution through ~5.4 lakh **fair price shops (FPSs)** across India.

Features:

- Covers **~81.35 crore beneficiaries** (75% rural + 50% urban).
- Provides **56–58 million tonnes** of foodgrains annually.
- Entirely **free of cost** since January 2023 (earlier NFSA required nominal payment).
- e-KYC and Aadhaar seeding of ration cards for transparency – **83% verified**.
- Budgeted **₹2.03 lakh crore food subsidy for FY26**.
- Re-verification drive underway to weed out **ineligible beneficiaries** (e.g., taxpayers, vehicle owners, non-users).

Miscellaneous

WIPO GLOBAL INNOVATION INDEX (GII) 2025

Context:

The WIPO Global Innovation Index (GII) 2025 ranked India 38th globally out of 139 economies, retaining its position as the top performer in Central & Southern Asia.

About WIPO Global Innovation Index (GII) 2025:

- **Launched by:** World Intellectual Property Organization (WIPO), in collaboration with Portulans Institute and partners.
- **Nature:** Annual benchmarking report, now in its **18th edition**, covering **139 economies** and **100 innovation clusters**.
- **Objective:** Measures countries' capacity and success in innovation, guides policymakers and industry leaders.
- **Conceptual Framework:**
  - **Innovation Inputs:** Institutions, Human Capital & Research, Infrastructure, Market Sophistication, Business Sophistication.

- **Innovation Outputs:** Knowledge & Technology Outputs, Creative Outputs.

- **Indicators Used:** 80+ indicators including R&D intensity, patent filings (PCT), venture capital flows, scientific publications, ICT adoption, unicorn valuations, high-tech exports, etc.
- **Global top 3 nations:** Switzerland (1st), Sweden (2nd), and United States (3rd).

About India's Performance in GII 2025:

- **Rank:** 38th globally (score: **38.2**), **1st in Central & Southern Asia**, leading lower-middle income group.
- **Innovation Over-performer:** India remains among the **longest-standing innovation over-performers**, performing above expectations for its income level for the **15th year**.
- **Strengths:**
  - **ICT services exports** – global leader.
  - **Unicorn valuations & late-stage VC deals** – among the top globally.
  - **Knowledge creation** – surge in publications (+7.6%), strong patent filings.
  - **Creative Outputs** – rank improved from 49 (2023) → 42 (2025).
- **Innovation Clusters:** India hosts **four clusters** in the world top-100 – Bengaluru (21st), Delhi (26th), Mumbai (46th), Chennai (new entry) – reflecting its strong startup ecosystem.

INVOLUTION

Context:
China's EV sector is facing severe "involution" — a cycle of destructive price wars and oversupply leading to financial stress for manufacturers.

About Involution:

- **What it is?**
  - **Involution** (Chinese: *nèijuǎn*) is a socio-economic phenomenon where **competition becomes excessively inward-looking**, leading to diminishing returns.
  - In the EV sector, it refers to **price wars so extreme** that firms sell below production cost, eroding profits and threatening survival.
- **Origin:**
  - **Word History:** Derived from Latin *involūtiōn-em* – "to turn inwards."
  - **Academic Usage:** Popularised by anthropologist **Clifford Geertz** in *Agricultural Involution* (1969), describing labour intensification in Java that raised output per acre but not per worker — leading to **stagnant incomes despite rising effort**.
- **Features:**
  - **Hyper-Competition:** Price wars between 120–130 EV makers push prices unsustainably low.
  - **Below-Cost Selling:** Retail prices drop below production costs, leading to mounting losses.
  - **Excess Capacity:** Overproduction with insufficient demand worsens inventory build-up.
  - **Trade War Trigger:** High U.S./EU tariffs redirect Chinese EVs to domestic markets, intensifying competition.
  - **Social & Policy Response:** Seen as a drag on economic stability, prompting government intervention.
- **Implications:**
  - **Industry Consolidation:** Small players risk bankruptcy, leading to mergers and shakeouts.
  - **Profit Erosion:** Threatens R&D investment and long-term competitiveness of Chinese EV makers.
  - **Employment Impact:** Layoffs possible as weaker firms exit market.
  - **Global Spillover:** Cheaper exports flood emerging markets, affecting local auto industries.

DECENTRALISED FINANCE (DEFI)

Context:
The DeFi boom has raised national security concerns, with experts warning of its misuse for terror financing and money laundering.

About Decentralised Finance (DeFi):

- **What it is?**
  - A **blockchain-based financial system** that allows people to save, borrow, invest, and transact without traditional banks.
  - Works through **smart contracts, decentralised apps (DApps), and peer-to-peer networks**.
- **Origin:**
  - Rooted in the **Bitcoin philosophy (2009)** of decentralisation and transparency.
  - Expanded with **Ethereum blockchain (2015)** and the creation of **DAOs (Decentralised Autonomous Organisations)**.
- **Aim:**
  - To **democratise financial access** by removing intermediaries.
  - Provide **inclusive, low-cost, borderless financial services** accessible to anyone with an internet connection.
- **How it Works?**
  - Users create a **crypto wallet** (no KYC required).
  - Transactions happen through **smart contracts** stored on blockchain.
  - Services include **decentralised exchanges (DEXs)**, lending, payments, derivatives, insurance, and creation of **stablecoins**.
  - Governance managed by **token holders** in DAOs, not central authorities.
- **Features:**
  - **Disintermediation:** Direct peer-to-peer transactions without banks.
  - **Transparency**: All transactions recorded on a public ledger.
  - **Anonymity**: No need for identity verification.
  - **Interoperability:** Works across multiple blockchain applications.
  - **Low-cost & fast:** Avoids interbank or international fees.
- **Significance:**
  - **Financial Inclusion** – Provides banking access to unbanked populations globally.
  - **Innovation Driver** – Creates new fintech products like stablecoins, decentralised insurance, and tokenised assets.

Economic Risks – Vulnerable to **hacking, fraud, terror financing, and money laundering** due to anonymity

FIRST OVERSEAS ATAL INNOVATION CENTRE

Context:

Union Education Minister of India inaugurated India's first overseas Atal Innovation Centre at IIT Delhi–Abu Dhabi campus during his UAE visit.

About First Overseas Atal Innovation Centre:

- **What it is?**
  - A premier innovation hub established outside India under the **Atal Innovation Mission (AIM)**.
- **Launched in:** September 2025, at IIT Delhi–Abu Dhabi campus.
- **Objective:**
  - To **promote innovation, research, and entrepreneurship** among students and young professionals.
  - To strengthen India–UAE collaboration in **education, sustainability, and technology-driven solutions**.
- **Functions:**
  - Incubate start-ups and mentor innovators.
  - Provide infrastructure and labs for cutting-edge research.
  - Encourage joint student exchange, teacher training, and skill-building programs.
  - Act as a bridge for **global knowledge-sharing and innovation networks**.

About Atal Innovation Mission (AIM):

- **What it is?**
  - A **flagship initiative of the Government of India** to create a culture of innovation and entrepreneurship.
- **Organisation:** Implemented by NITI Aayog.
- **Launched in:** 2016.
- **Aim:** To develop an **innovation-driven ecosystem** in schools, universities, and industries.
- **Key Features:**
  - **Atal Tinkering Labs (ATLs):**

- Labs set up in schools for students (Class 6–12) to learn robotics, IoT, 3D printing, and electronics.
- Over **10,000 labs** established across India.

o **Atal Incubation Centres (AICs):**

- Business incubators at universities and corporates.
- Support start-ups with mentoring, funding, networking, and infrastructure.
- **72 AICs functional**, supporting **3500+ start-ups** and generating **32,000+ jobs**.

o **Entrepreneurial Ecosystem:**

- Focus on diverse sectors like HealthTech, FinTech, AgriTech, EdTech, Food Processing, Drone & Space Tech, AR/VR.
- Over **1000 women-led start-ups** supported.

DIGITAL YEN – DCJPY

Context:

Japan Post Bank announced it will launch a digital yen (DCJPY) by fiscal 2026, developed with DeCurret DCP, marking one of the biggest government-linked pushes into blockchain-based deposit currencies.

About Digital Yen – DCJPY:

What it is?

- **DCJPY** is a **blockchain-based deposit currency**, fully backed **1:1 by fiat yen**.
- Unlike typical stablecoins, it is issued through the regulated banking system, making it more secure and credible.

Launched by:

- **Japan Post Bank**, with shareholders including the Japanese government, in collaboration with **DeCurret DCP** (a subsidiary of Internet Initiative Japan).

Aim:

- To enable **instant, transparent, and convenient digital transactions** for depositors.
- To expand the use of blockchain in mainstream finance, including **digital securities and asset tokenization**.

How it Works?

- Customers convert yen deposits into **DCJPY tokens**.
- These tokens can then be used for **real-time transactions** of digital securities and blockchain-based assets.
- Entirely **ledgered on blockchain**, ensuring traceability and transparency.

Features:

- **Fully backed 1:1** by yen (no volatility risk like other cryptocurrencies).
- **Blockchain-based** for security and decentralisation.
- Enables **instant settlement**, unlike traditional bank transfers.
- Usable by **ordinary depositors** through Japan Post Bank.
- Positioned as a **tokenized deposit currency** distinct from private stablecoins.

THE WORLD LIBERTY FINANCIAL TOKENS ($WLFI)

Context:

The World Liberty Financial tokens ($WLFI), linked to the Trump family's cryptocurrency venture, began trading on major exchanges like Binance, OKX, and Bybit.

About The World Liberty Financial tokens ($WLFI):

What it is?

- A **cryptocurrency token ($WLFI)** under the **World Liberty Financial** DeFi platform.
- Functions alongside a **stablecoin** issued by the venture.

Launched by:

- Initiated in **2024 by the Trump family and business partners**, with Donald Trump reportedly earning over **$500 million** from the project.

How it works?

- Initially sold as **non-tradable tokens** that granted holders voting rights on governance issues (e.g., code changes).
- Now tradable on major crypto exchanges, allowing **spot trading** and **perpetual futures**.
- **Limited circulating supply** at launch, with future allocations governed by investor votes.

Features:

- **Tradable on top exchanges**: Binance, Bybit, OKX, KuCoin, MEXC, Gate.io, etc.
- **Spot Trading**: Direct ownership and withdrawal (ideal for beginners).
- **Perpetual Futures**: Leverage-based advanced trading with higher risk.
- **Governance Role**: Early investors can vote on business changes.
- **Price at launch**: Around **$0.31 per token** (CoinGecko data).

Significance:

- **Political-Crypto Nexus**: Links between a former U.S. President and DeFi raise concerns about **conflict of interest** in crypto regulation.
- **Investor Appeal**: Attracts hype due to Trump's brand value, not just utility.
- **Liquidity & Speculation**: Trading generates volatility, new fees for exchanges, and draws wider crypto community interest.

AGRICULTURE

Agri-marketing

NILGIRI TEA

Context:

Nilgiris tea growers are facing a persistent cost price crisis due to low prices for green tea leaves (GTL), overproduction, and weak auction mechanisms, threatening the sustainability of small growers in the region.

About Nilgiri Tea:

- **What it is?**
  - Nilgiri tea is a variety of **Camellia sinensis var. sinensis**, grown in the Nilgiris district of Tamil Nadu.
  - Known for its **brisk, fragrant, and full-bodied liquor**, it is often blended into iced teas, masala chai, and global tea brands.
- **Region:**
  - Cultivated mainly in the **Nilgiris district, Tamil Nadu**, with smaller areas in Kerala and Karnataka.
  - Recognised as a **Geographical Indication (GI) product** since 2008.
- **Features:**
  - Produces both **orthodox rolled teas** and **CTC (crush-tear-curl) teas**.
  - Flavour profile: **citrus and floral notes, light yet full-bodied**, retains clarity when cooled (ideal for iced tea).
  - Used in blends by **global commercial brands** like Nestea.
- **Geographic Conditions Needed:**
  - **Altitude: 1,000–2,500 metres** in the Western Ghats.
  - **Climate:** Two monsoons (Southwest & Northeast), alternating **fog, rain, and sunshine**.
  - **Soil: Lateritic loam**, rich and well-drained, supporting high-quality growth.
  - **Cultivation cycle:** Frequent plucking (≈32 times annually), with the first harvest ("**frost tea**") after a short dormancy in winter, noted for unique flavour.
- **Issues faced by Nilgiri tea industry:**
  - **Low Prices:** Green Tea Leaf (GTL) prices often below cost of production.
  - **Overcapacity:** Too many factories vs. crop output, reducing quality.
  - **Market Dependence:** Heavy reliance on Russia/USSR in past; poor diversification.

- **Auction Problems:** Manipulation, advance deals, and weak price discovery.
- **Quality Concerns:** Adulteration and inconsistent standards.
- **High Costs:** Rising labour and input costs burden small growers.

BHARATI INITIATIVE

Context:

The Agricultural and Processed Food Products Export Development Authority (APEDA) has launched the BHARATI initiative to support 100 agri-food startups and target $50 billion agri-food exports by 2030.

About BHARATI Initiative:

What it is?

- **BHARATI** stands for Bharat's Hub for Agritech, Resilience, Advancement and Incubation for Export Enablement.
- It is a national startup-support and export-acceleration platform for India's agri-food and agri-tech ecosystem.

Organisation Involved:

- **APEDA** (Agricultural and Processed Food Products Export Development Authority), an arm of the **Ministry of Commerce & Industry**.
- Supported by the **Ministry of Food Processing Industries** and aligned with Startup India and Atmanirbhar Bharat.

Objective:

- Empower 100 agri-food and agri-tech startups.
- Boost exports to **$50 billion by 2030**.
- Foster innovation in agri-food production, processing, packaging, and logistics.

Features:

- **Startup Cohort**: 100 startups selected via APEDA's website (starting September 2025).
- **Acceleration Programme**: 3-month training on product development, export readiness, compliance, and market access.
- **Innovation Focus**: High-value GI products, organic foods, superfoods, livestock products, AYUSH products.
- **Technology Adoption**: AI-based quality checks, blockchain-enabled traceability, IoT-enabled cold chains, agri-fintech solutions.
- **Problem Solving**: Addressing export challenges of perishability, wastage, logistics, packaging, and quality assurance.
- **Awareness Campaign**: Nationwide outreach to attract startups and stakeholders.

Significance:

- **Economic** – Positions India as a **global agri-food export hub**, unlocking $50B trade potential.
- **Innovation** – Encourages tech-driven agriculture solutions, enhancing resilience and competitiveness.
- **Employment** – Creates jobs across food processing, logistics, packaging, and value chains.

Agri-practices and New Technologies

SOILIFICATION TECHNOLOGY

Context:

Researchers at the Central University of Rajasthan (CUoR) successfully grew wheat on desert land in Ajmer using 'soilification' technology.

About Soilification Technology:

- **What it is?**
  - A **biotechnology-based method** that transforms loose desert sand into soil-like medium suitable for farming.
  - Uses **indigenous bioformulations and polymers** to improve fertility and water retention.
- **How it works?**
  - **Polymer application:** Cross-links sand particles, converting loose sand into

structured soil.
    - **Bioformulation:** Enhances microbial activity, improving nutrient cycling and soil health.
    - **Water retention:** Creates a binding effect, lowering irrigation requirements.
    - **Stress resistance:** Strengthens plant tolerance to heat and arid conditions.
    - **Crop adaptability:** Successfully trialled on wheat, bajra, guar gum, and chickpea.
- **Key Features:**
    - **Water efficient:** Reduced irrigation cycles (3–4 vs. 5–6 in normal farming).
    - **High yield ratio:** Wheat yield recorded at **1:20 (seed to harvest)**, twice the output of untreated desert land.
    - **Low input cost:** Uses locally available bio-agents and simple application techniques.
    - **Eco-restorative:** Converts barren deserts into cultivable farmland without heavy machinery.
- **Significance:**
    - **Desertification control:** Prevents Thar desert expansion towards NCR by restoring soil fertility.
    - **Water security:** Minimises groundwater use, critical in water-scarce Rajasthan.
    - **Food security:** Enables cultivation of staples like wheat and millet in arid belts.

AI WEATHER FORECASTING FOR FARMERS

Context:

MoAFW launched a first-of-its-kind AI-powered monsoon forecasting initiative, sending SMS-based alerts to 3.8 crore farmers across 13 states for Kharif planning.

About AI Weather Forecasting for Farmers:

- **What It Is?**
    - A first-of-its-kind government initiative using Artificial Intelligence (AI) to deliver monsoon forecasts via SMS (m-Kisan) directly to farmers.
    - Covers 3.8 crore farmers across 13 states, focusing on Kharif crop planning and risk reduction.
- **Developed By:**
    - Ministry of Agriculture & Farmers' Welfare (MoAFW) in collaboration with:
        - Development Innovation Lab – India
        - Precision Development
- **Technology Used:**
    - **AI Forecasting Models:**
        - Google Neural GCM (Global Climate Model)
        - ECMWF's Artificial Intelligence Forecasting System (AIFS)
    - **Blended Models:** Provide **4-week advance forecasts** with higher accuracy than conventional methods.
    - **m-Kisan SMS Platform:** Disseminates localized advisories in farmer-friendly language.
- **Objectives:**
    - **Early Warning:** Enable farmers to plan sowing and irrigation ahead of monsoon onset.
    - **Risk Mitigation:** Minimize losses from mid-season dry spells and extreme weather.
    - **Decision Support:** Help farmers choose crops and inputs efficiently.
    - **Climate Resilience:** Strengthen adaptive capacity to climate change-induced variability.
- **Key Features:**
    - **Personalized & Localized Forecasts:** Region-specific, actionable information.
    - **Weekly Updates:** Continuous advisories during monsoon pauses or delays.
    - **Farmer-Friendly Communication:** Simple language, easy-to-act recommendations.
    - **Real-Time Accuracy:** Identified 20-day monsoon stall in 2025 successfully.
    - **Scalable Model:** Can be extended to Rabi season and other states.
- **Significance:**
    - **Food Security:** Timely sowing improves yield and reduces crop losses.
    - **Economic Impact:** Reduces input wastage, boosts rural income and productivity.
    - **Technological Leadership:** Positions India as global pioneer in AI-enabled agri-advisories.

Crops

AFLATOXIN

Context:

Indonesia has suspended groundnut imports from India over aflatoxin contamination concerns, with exporters objecting to the delayed notification and non-WTO-compliant testing procedures.

About Aflatoxins:

What They Are?

- **Definition:** Aflatoxins are **toxic secondary metabolites** produced by fungi *Aspergillus flavus* and *Aspergillus parasiticus*.
- **Occurrence:** Thrive in **hot, humid climates**, contaminating groundnuts, maize, rice, spices, tree nuts, and even crude oils before or after harvest.

Category:

- **Mycotoxins:** Belong to the class of **mycotoxins** — toxic chemical products of fungi.
- **Key Types:**
  - **B1** – Most common & most toxic; strong liver carcinogen, strictest global limit.
  - **B2** – Co-occurs with B1, less toxic but adds to total aflatoxin load.
  - **G1** – Green-blue fluorescent toxin, genotoxic, found in nuts/maize.
  - **G2** – Mildest form, still harmful in chronic exposure (immune/growth impact).
  - **M1** – Metabolite of B1 in milk; heat-stable, risk for infants even after pasteurisation.

Key Features:

- **Heat Stable:** Not destroyed by normal cooking or processing.
- **Genotoxic & Carcinogenic:** Capable of causing DNA damage and cancer.
- **Invisible Threat:** Contamination cannot be detected by sight, smell, or taste — needs lab testing.
- **Global Concern:** Subject to strict **Codex Alimentarius** and **WTO SPS standards** for international trade.

Impacts on Food & Health:

- **Health Risks:** Causes liver cancer, immune suppression, growth retardation in children, and acute aflatoxicosis in severe cases.
- **Food Safety:** Leads to **trade rejections**, loss of farmer income, and wastage of food consignments.
- **Economic Impact:** Major issue for exporters as importing countries impose **strict aflatoxin limits** (EU: ≤4 µg/kg for B1 in peanuts).
- **Public Health Concern:** Aflatoxin M1 in milk is a risk for infants and lactating mothers.

EUSTOMA

Context:

Exotic Eustoma has bloomed for the first time in Odisha in a polyhouse at Sanatanpali, Sambalpur district, developed by CSIR–NBRI.

- Until NBRI's breakthrough, Eustoma (Lisianthus) was mostly imported from countries like the Netherlands and Kenya for premium events, weddings, and luxury décor.

About Eustoma:

- **What it is?**
  - Eustoma, also known as **Lisianthus** or **Prairie Gentian**, is a herbaceous annual flower from the gentian family.
  - It is prized globally for its long vase life and vibrant colors, making it a premium ornamental flower.
- **Habitat & Native Region:** Native to Mexico, southern USA, Caribbean, and northern South America.
  - Typically grows in **grasslands and disturbed areas**, thriving in warm climates.
- **Key Features of Eustoma:**
  - **Premium Ornamental Flower**: Large, funnel-shaped blooms in multiple colors (pink, purple, white, blue) with long vase life, making it a florist favorite.
  - **Adaptability & Growth**: Thrives in warm climates, grows 30–90 cm tall; Sambalpur success shows it can be cultivated even in hot Indian conditions.

- **High Economic Potential**: Can be harvested twice a year, with profit potential up to ₹2 lakh per acre per season — a boost for farmer incomes.
- **Diversity & Appeal**: Available in single and double-flowered varieties, including rare bicolored types, ideal for weddings, décor, and exports.
- **Sustainability & Market Substitution**: Reduces reliance on imported cut flowers, encourages local production, and supports CSIR-NBRI's 400+ farmer clusters.

- **Uses of Eustoma**
  - **Cut Flower Industry** – Popular in bouquets, décor; stays fresh for 2+ weeks.
  - **Export Floriculture** – New export option; reduces reliance on rose exports.
  - **Retail & Hospitality** – Ideal for hotels, events; lasts longer than roses/gerberas.
  - **Gardening & Landscaping** – Dwarf varieties for pots, balconies, landscaping.

Schemes and Organizations

AIDIS & SAS 2026–27: KEY HOUSEHOLD & AGRICULTURE SURVEYS BY NSO

Context:

NSO (MoSPI) announced that AIDIS and SAS of Agricultural Households will be conducted between July 2026 – June 2027.

About All India Debt and Investment Survey (AIDIS):

- **What it is?**
  - India's **flagship survey on household finance**, covering **debt, assets, and investments** across rural and urban households.
- **Origin & Publisher:**
  - Originated as **All India Rural Credit Survey (1951-52)**.
  - Expanded in **1961-62** to include **investment and urban sector**.
  - Conducted by **National Statistics Office (NSO), MoSPI**.
- **Aim / Objectives:**
  - Capture **extent and nature of household indebtedness**.
  - Measure **asset ownership and distribution** to inform national accounts.
  - Provide **input to RBI, MoSPI, NITI Aayog** for credit policy, financial inclusion, and inequality studies.
- **Key Features**
  - **Decadal Survey:** Last conducted in **77th Round (2019)** on RBI request.
  - **Covers Rural & Urban Areas:** Includes institutional and non-institutional credit sources.
  - **Provides Disaggregated Data:** By state, sector, income group, and asset class.
  - **Supports Policy:** Used for framing schemes on financial literacy, credit penetration, and asset creation.

About Situation Assessment Survey (SAS) of Agricultural Households:

- **What it is?**
  - A **nationally representative survey** to evaluate **economic well-being of farmers** and their households.
- **Origin & Publisher:**
  - **First launched in 2003** as part of NSS rounds.
  - Expanded in **2013** and strengthened in **2019 round**.
  - Conducted by **NSO (MoSPI)** in coordination with **Ministry of Agriculture**.
- **Aim / Objectives:**
  - Assess income, expenditure, and debt profile of farm households.
  - Track livelihood patterns, crop & livestock production, access to government schemes & crop insurance.
  - Inform agriculture & rural development policies for inclusive growth.
- **Key Features:**
  - **Covers All Agricultural Households:** Including landless engaged in farming.
  - Collects data on **land & livestock ownership**, **technology adoption**, and **market access**.
  - **Monitors Credit Access:** Institutional finance, crop loans, and insurance coverage.
  - Used by **NITI Aayog, MoA&FW, research bodies, banks** for policy design.

NATIONAL COOPERATIVE EXPORTS LIMITED (NCEL)

Context:
National Cooperative Exports Limited (NCEL) and Agricultural and Processed Food Products Export Development Authority (APEDA) signed an MoU to boost cooperative-led agricultural exports.

About National Cooperative Exports Limited (*NCEL*):

- **What it is?**
  - A **national-level multi-state cooperative society**, functioning as an umbrella organization for all cooperative exports in India.
- **Established in**: 25 January 2023, registered under the Multi-State Cooperative Societies Act, 2002.
- **Headquarters:** New Delhi, India.
- **Objective:**
  - To strengthen India's cooperative sector in international markets by facilitating exports, improving farmer incomes, and realising the vision of **"Sahakar se Samriddhi".**
- **Promoters:**
  - **Major cooperative institutions:** AMUL (GCMMF), IFFCO, KRIBHCO, NAFED, and NCDC.
- **Functions:**
  - Act as an umbrella platform for cooperatives to enter global trade.
  - Support export of agri, dairy, fisheries, horticulture, handloom, handicraft, textiles, and allied products.
  - Provide infrastructure support, branding, compliance, and market access.
  - Empower cooperatives to compete globally through training and market intelligence.

Miscellaneous

WORLD FOOD INDIA (WFI) 2025

Context:
The 4th edition of World Food India (WFI) 2025 will be inaugurated by Prime Minister of India on 25th September 2025 at Bharat Mandapam, New Delhi.

About World Food India (WFI) 2025:

- **What it is?**
  - A **flagship international event** hosted by the **Ministry of Food Processing Industries (MoFPI)**.
  - Serves as a **global platform** for food innovation, investment, technology, and sustainability in India's food ecosystem.
- **Origin & History:**
  - Conceptualised by **MoFPI** to showcase India as a **food processing hub**.
  - **First edition in 2017**, followed by 2nd in **2023**, 3rd in **2024**, and now the **4th in 2025**.
  - Structured to strengthen India's positioning as the **"Food Basket of the World."**
- **Aim:**
  - Promote **foreign and domestic investment** in India's food processing sector.
  - Strengthen **farm-to-fork linkages** and value addition.
  - Encourage **sustainable and future-ready food systems**.
  - Showcase **India's diverse food culture** to the global community.
- **Features of WFI 2025:**
  - **Parallel Events:**
    - *3rd Global Food Regulators Summit* (FSSAI).
    - *24th India International Seafood Show* (SEAI).
    - *Reverse Buyer-Seller Meet* (APEDA).
  - **Core Pillars:**
    - Sustainability & Net Zero Food Processing.

- India as a Global Food Hub.
- Frontiers in Processing & Packaging Technologies.
- Food for Nutrition, Health & Wellness.
- Livestock & Marine Products driving rural economy.

- **Significance:**
  - **Economic:** Strengthens investments in R&D, cold chains, startups, logistics, and retail.
  - **Global positioning:** Positions India as a **global food hub and innovation leader**.
  - **Strategic:** Promotes **sustainable food systems** in line with SDGs.

Biodiversity

BONNET MACAQUES

Context:
Nine bonnet macaques were found dead in Thiruvananthapuram, Kerala, raising fears of poisoning or disease.

About Bonnet Macaques:

What it is?

- A primate species endemic to **southern India**, often found living close to human settlements.
- Known for the distinctive **"bonnet-shaped" hair whorl** on its head.

Habitat:

- Found across **Western Ghats, southern plains, and urban fringes**.
- Thrive in **evergreen forests, dry deciduous forests, plantations, and village edges**.
- Highly arboreal but also terrestrial; adapt well near humans.

IUCN Status: Listed as Least Concern (LC) due to wide distribution.

Features:

1. **Physical:**
   - Color: Greyish-brown to golden-brown fur, pinkish hairless face.
   - Size: 3.9 kg (female) to 6.7 kg (male); body length 35–60 cm (excluding tail).
   - Males larger than females (sexual dimorphism).
2. **Biological:**
   - **Reproduction:** Annual breeding season (Sept–Oct); single offspring after ~24 weeks gestation.
   - **Lifespan:** 20–25 years in wild; up to 35 years in captivity.
   - Females give birth to ~5 offspring before menopause (~27 years).
3. **Social:**
   - Live in **multi-male, multi-female troops** averaging ~30 individuals.
   - **Linear dominance hierarchy**; females are philopatric (stay in natal groups).
   - Strong **social grooming** bonds; unique tolerance of juveniles by dominant males.
4. **Food Habits:**
   - Omnivorous and opportunistic.
   - **Diet:** Fruits, seeds, insects, crops, and human food waste.
   - Frequently forage in **urban and semi-urban areas**, often raiding households and plantations.

NEW CORAL SPECIES 'IRIDOGORGIA CHEWBACCA' IDENTIFIED

Context:
Scientists have discovered and named a new deep-sea coral species *Iridogorgia chewbacca* in the western Pacific Ocean.

About New Coral Species 'Iridogorgia chewbacca' Identified:

- **What It Is?**
  - A newly identified **deep-sea coral species** belonging to the genus *Iridogorgia*.

- Officially described and published in **Zootaxa** journal.

- **Found In:**
  - **Tropical Western Pacific Ocean** – first observed in 2006 and later confirmed as a distinct species through genetic analysis.
- **Name & Inspiration:**
  - Named ***Iridogorgia chewbacca*** after **Chewbacca**, the tall and furry character from *Star Wars*.
  - The name reflects its **hairy, curly, shiny branches** that resemble the character's fur.
- **Key Features:**
  - **Appearance:** Long, curly, "hair-like" branches with a reflective surface.
  - **Growth Pattern:** Grows **upright and solitary** on the ocean floor, resembling Chewbacca's tall stance.
  - **Rarity:** Previously seen in Hawaiian waters but formally classified only now.
- **Significance:**
  - **Biodiversity Discovery:** Highlights that even well-studied oceans still hold undiscovered species.
  - **Marine Ecology:** Adds to understanding of **deep-sea ecosystems** and their role in ocean health.
  - **Scientific Record:** Naming immortalizes popular culture in science, sparking public interest in marine research.

YELLOW-CRESTED COCKATOOS

Context:

Critically endangered yellow-crested cockatoos in Hong Kong are losing natural nesting sites due to tree loss and urban trimming, prompting conservationists to install artificial nest boxes to support their survival.

About Yellow-Crested Cockatoos:

What They Are?

- Medium-sized **white cockatoos** with a **striking yellow crest**, known for loud calls and social behaviour.

Scientific name: *Cacatua sulphurea*.

Native Range:

- **Endemic to Indonesia and Timor-Leste** – once common in Nusa Tenggara, Sulawesi, Masalembu Islands.
- Currently survives in small populations on **Komodo, Flores, Sumbawa, Timor** and a few Sulawesi islands.

Habitat:

- Prefer tropical dry forests, woodlands, and tree cavities for nesting.
- In cities, adapt to urban parks and tall tree canopies, coexisting with human activity.

IUCN Status: Critically Endangered on the IUCN Red List.

Features:

- **Physical:**
  - Medium-sized bird with **snow-white plumage and a bright yellow crest** that fans up when excited or alarmed.
  - Has a **strong, curved black beak** adapted for cracking nuts and seeds; noticeably smaller than the sulphur-crested cockatoo.
- **Social Behaviour:**
  - Highly **gregarious and vocal**, often seen flying in noisy flocks, communicating through loud squawks.
  - Exhibit **strong pair-bonding**, forming lifelong monogamous pairs and showing cooperative behaviour within groups.
- **Biological Traits:**
  - Nest in **natural tree hollows** or cavities, laying **2–3 eggs per clutch** during breeding season.
  - Both male and female share **incubation duties** and jointly feed the chicks until fledging, ensuring high parental investment.
- **Migration & Movement:**
  - Mostly **sedentary species**, staying within established home ranges throughout the year.
  - May undertake **local movements** to find food, water, or safe nesting sites, especially when habitat is disturbed.

SEVEN NATURAL HERITAGE SITES ADDED TO UNESCO'S TENTATIVE LIST

Context:

Seven new natural heritage sites from India have been added to UNESCO's Tentative List of World Heritage Sites, raising India's total to 69 properties under consideration.

About Seven Natural Heritage Sites Added to UNESCO's Tentative List:

What It Is?

- The **Tentative List** is the first step in the process of attaining **World Heritage Site status** under UNESCO.
- Inclusion signals international recognition and begins the process for future nomination and global conservation funding/support.

Aim:

- **Preserve Geological and Natural Heritage:** Highlight sites with unique ecological, geological, and scientific significance.
- **Promote Global Recognition:** Enhance India's cultural diplomacy and soft power by showcasing natural wonders.

Sites Nominated & Key Features

1. **Deccan Traps, Maharashtra** – Among the **world's best-preserved lava flows**, located in **Koyna Wildlife Sanctuary** (also a UNESCO site).
2. **St. Mary's Island Cluster, Karnataka** – **Rare columnar basaltic rock formations** from the **Late Cretaceous period (85 mya)**.
3. **Meghalayan Age Caves, Meghalaya** – Includes **Mawmluh Cave**, the **global stratotype** for Meghalayan Age in the Holocene Epoch.
4. **Naga Hill Ophiolite, Nagaland** – Exposes **oceanic crust uplifted on land**, crucial for understanding **plate tectonics**.
5. **Erra Matti Dibbalu, Andhra Pradesh** – **Red sand dunes** with paleo-climatic evidence, showcasing **coastal geomorphology**.
6. **Natural Heritage of Tirumala Hills, Andhra Pradesh** – Home to the **Eparchaean Unconformity** (1.5 billion years old) and **Silathoranam arch**.
7. **Varkala Cliffs, Kerala** – Spectacular coastal cliffs exposing **Warkalli Formation**, with natural springs and scenic value.

Significance:

- **Strengthens India's Global Standing:** Positions India as a leader in geodiversity and nature conservation.
- **Boosts Research & Education:** Provides opportunities for geological, ecological, and climate studies.
- **Supports Eco-Tourism:** Attracts global tourists, creating jobs while maintaining ecological balance.

PERIYAR TIGER RESERVE

Context:

Kerala Finance Inspection Wing report flagged financial irregularities at Periyar Tiger Reserve (PTR) – diversion of tourism income to a "Park Welfare Fund" without government approval.

About Periyar Tiger Reserve:

What It Is?

- A **protected area and Project Tiger Reserve** renowned for rich biodiversity and **community-based ecotourism model**.
- Recognized as **Best Managed Tiger Reserve (2022)** by NTCA under Management Effectiveness Assessment.
- Also, a **UNESCO World Heritage Site** (Western Ghats).

Location:

- **Situated in:** Cardamom & Pandalam Hills, Southern Western Ghats, Kerala.
- **Districts Covered:** Idukki, Kottayam, Pathanamthitta.

History:

- Initially declared **Periyar Wildlife Sanctuary (1950)**.
- Brought under **Project Tiger** **in 1978** as India's **10th Tiger Reserve**.
- Developed unique **Periyar Model** of participatory forest management — transforming "poachers into protectors."

Key Features:

- **Flora & Fauna:**
  - Home to **Bengal Tiger, Indian Elephant, Gaur, Leopard, Wild Dog**, and endemic

species.
- Rich fish diversity with 7 endemic species and 3 unique endemic plant species.

- **Community Involvement:**
  - 81 Ecodevelopment Committees (EDCs), including **Vasanthasena women's group** for sandalwood patrolling and plastic removal.
  - Organic pepper cultivation by Urali tribes exported globally.
- **Tourism & Education:**
  - Interpretation Centre, Kalari & Vanasree Halls, Amphitheatre for eco-awareness.
  - Nature Education programmes since 1989, training for schools, NGOs, media.
- **Innovations:**
  - **M-STrIPES app** for patrolling & ecological data.
  - Dog squad ("Periyar Sniffers"), VIPER special task force for anti-poaching and rescue.
  - Climate-resilient farming projects to support tribal livelihoods.

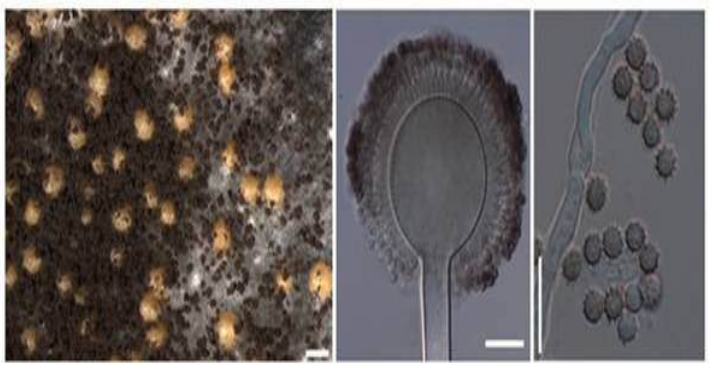
RED IVY PLANT

Context:
Scientists at JNTBGRI, Kerala have developed a multifunctional wound-healing pad using the red ivy plant (*Strobilanthes alternata*), combining traditional knowledge with nanotechnology.

About Red Ivy Plant (*Murikooti Pacha*):
- **What It Is?**
  - A **tropical medicinal plant** widely known for its wound-healing properties and used in indigenous medicine.
  - **Scientific Name:** Strobilanthes alternata (Family: Acanthaceae).
- **Region Found In:**
  - Grows **abundantly in tropical regions** including India, Sri Lanka, and Southeast Asia.
  - Found in **moist forests and shaded rural areas**; thrives in Kerala's Western Ghats ecosystem.
- **Key Features:**
  - **Appearance:** Spreading vine-like plant with red-green leaves.
  - **Bioactive Compound:** Acteoside – proven antioxidant, anti-inflammatory, and antimicrobial agent.
  - **Sustainability:** Easily cultivable, ensuring large-scale availability for medicinal use.
- **Significance:**
  - **Traditional Medicine:** Used by local healers for treating cuts, bruises, and skin infections.
  - **Scientific Breakthrough:** First-time isolation of **acteoside** from this plant → basis for wound-healing innovation.
  - **Healthcare Impact:** Cost-effective, biodegradable wound pad with enhanced healing at low concentration (0.2%).

TWO NEW SPECIES OF ASPERGILLUS SECTION NIGRI FROM THE WESTERN GHATS

Context:
Indian scientists from MACS–Agharkar Research Institute (Pune), under the Department of Science & Technology (DST), have discovered two new species of Aspergillus section Nigri from the Western Ghats.



About Two New Species of Aspergillus section Nigri from the Western Ghats:
- **Aspergillus Section Nigri:**
  - A group of **black-coloured fungi**, commonly called **black aspergilli**.
  - Found widely in soil and plants, with important uses in **citric acid production, food industry, fermentation, and agriculture**.
  - Known as **"workhorses of biotechnology"** due to their industrial applications.
- **Newly Identified Species:**
  - **Aspergillus dhakephalkarii:**
    - Found in the Western Ghats.
    - Grows rapidly, produces brown spores and orange sclerotia (resting structures).

- Has **smooth, oval-shaped spores**, unlike many others which have rough, spiny ones.

- **Aspergillus patriciawiltshireae:**
  - Also from the Western Ghats.
  - Fast-growing with abundant sclerotia and modest spore production.
  - Has **spiny spores** and branching structures that split into many columns.
- Additionally, two species were reported **for the first time in India**: *A. aculeatinus* and *A. brunneoviolaceus*.

- **Significance:**
  - Shows that the **Western Ghats are rich in hidden fungal diversity.**
  - Useful for **industry** (citric acid, food fermentation), **agriculture** (soil nutrient support), and **biotech applications**.
  - Strengthens India's contribution to **taxonomy, ecology, and biotechnology research**.

PALLAS'S CAT

Context:

A WWF-India survey in Arunachal Pradesh has captured the first photographic evidence of Pallas's cat in the state, reaffirming the eastern Himalayas as a global biodiversity hotspot.

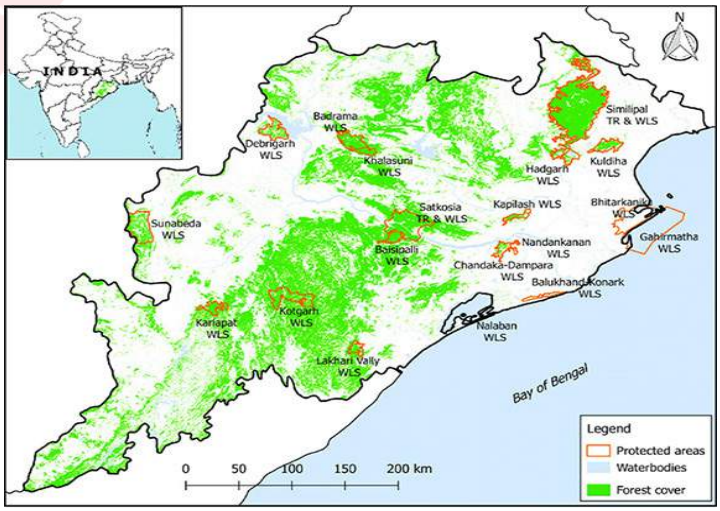
About Pallas's Cat:

- **What it is?**
  - Pallas's cat (*Otocolobus manul*), also called **manul**, is a small wild cat species believed to be one of the oldest surviving felines, diverging ~5.2 million years ago.
  - It resembles a domestic cat in size but looks stockier due to its dense coat.
- **Found in:**
  - Native to **Central Asia** – particularly Mongolia, China, and parts of Russia.
  - Recently photographed in Arunachal Pradesh, extending its known eastern Himalayan range beyond Bhutan & Sikkim.
- **Habitat:**
  - High-altitude grasslands, rocky steppes, and cold deserts.
  - Recorded at elevations close to **5,000 metres** in the eastern Himalayas.
- **Features:**
  - Short legs, rounded low-set ears, and a dense fur coat that changes with seasons for camouflage.
  - Ambush predator, hunting rodents, pikas, lizards, and small birds.
  - Distinctive **yelping call**, unlike most cats, and rounded pupils instead of vertical slits.
  - **Lifespan:** ~8–9 years in the wild; solitary and secretive, mostly nocturnal/crepuscular.
- **Significance:**
  - A **rare and elusive species**, considered a milestone discovery in Indian wildlife research.
  - Strengthens ecological understanding of the **eastern Himalayas as a biodiversity hotspot.**

DEBRIGARH WILDLIFE SANCTUARY

Context:

Odisha's Debrigarh Wildlife Sanctuary has received NTCA approval to become India's newest tiger reserve after a remarkable ecological and community-led transformation.



About Debrigarh Wildlife Sanctuary

- **What it is?**
  - A protected area in western Odisha, now upgraded to a tiger reserve, known for rich biodiversity, eco-tourism, and community-driven conservation.
- **Location:**
  - Located near **Sambalpur**, bordered by the **Hirakud Reservoir.**

- **History:**
  - Freedom fighter **Veer Surendra Sai** used Debrigarh's rugged terrain as his base during resistance against the British.
  - Bara Bakra inside the sanctuary remains a pilgrimage site linked with his legacy.
  - Declared a sanctuary in 1985 and NTCA approved it as a tiger reserve in 2025.
- **Key Features:**
  - Spread over **804 sq km**, with ~347 sq km core area and adjoining wetlands.
  - **Fauna:** Indian bison, sambar, wild boar, leopards, wild dogs, chousingha (four-horned antelope), 300+ bird species (120 migratory).
  - **Ecosystem:** Unique **amphi-terrestrial habitat** of forests, grasslands, and wetlands; Ramsar-tagged Hirakud Wetland.
  - **Innovative eco-tourism:** India's first **dark sky tourism hub** with stargazing facilities; 53 safari vehicles, kayaking, cycling, birding trails.
- **Significance:**
  - **Conservation success**: Prey base expansion, gaur population growth, 40% newborn animal herds.
  - **Community model:** 400 families voluntarily relocated with rehabilitation package; 155 villages engaged as conservation partners.
  - **National model**: Integrates wildlife protection, sustainable tourism, and historical heritage—a replicable blueprint for other reserves.

Environmental Pollution

TWO NEW RAMSAR SITES IN BIHAR

Context:

India added two new Ramsar sites in Bihar—Gokul Jalashay and Udaipur Jheel— raising the national tally to 93 wetlands of international importance, consolidating India's top position in Asia.

About Two New Ramsar Sites in Bihar:

1. **Gokul Jalashay (Buxar, 448 ha):**
   - An **oxbow lake** on the southern edge of the Ganga.
   - Acts as a **flood buffer** for nearby villages.
   - Home to **50+ bird species**.
   - Supports fishing, farming, irrigation; villagers conduct **community-led cleaning rituals** annually.
2. **Udaipur Jheel (West Champaran, 319 ha):**
   - An **oxbow lake** surrounding a village.
   - **280+ plant species**, including **Alysicarpus roxburghianus (endemic herb)**.
   - Important **wintering ground** for ~35 migratory birds, incl. **vulnerable Common Pochard**.

About Ramsar Sites:

- **What it is?**
  - Wetland sites of **international importance** under the **Ramsar Convention (1971)**, promoting conservation and sustainable use.
- **Origin:** Signed in **Ramsar, Iran (1971)**; came into force in **1975** under UNESCO.
- **Aim:** Protect wetlands as critical ecosystems for **biodiversity, water security, flood control, and livelihoods**.
- **Key Features:**
  - Provides **framework for national action + international cooperation**.
  - Identifies wetlands vital for **rare ecosystems, migratory birds, endangered species, fisheries, and hydrological balance**.

India and Ramsar Sites:

- **Current total (Sept 2025):** 93 wetlands across **13.6 lakh hectares**.
- **Growth:** 26 (2012) → 93 (2025), with **51 sites added since 2020**.
- **Global Standing:**
  - **India:** 3rd in the world (after UK – 176, Mexico – 144).
  - **Asia:** 1st in number of Ramsar sites.
- **Bihar:** Now has **5 Ramsar sites** (with the new additions).

ISOBUTANOL

Context:

The Automotive Research Association of India (ARAI) is conducting a pilot project to blend isobutanol with diesel, after ethanol–diesel blending failed.

About Isobutanol:

- **What It Is?**
  - **Isobutanol** is a **four-carbon alcohol** (C4H10O), clear, flammable liquid with higher energy density than ethanol.
  - Used as a solvent in paints, coatings, and now being explored as a **biofuel blendstock** for diesel engines.
- **Formation Process:**
  - Produced by **fermenting natural sugars** (cane juice, molasses, grains) using **genetically engineered microbes** under sterile conditions.
  - Requires **fermentation tank retrofitting** and **distillation units** to separate ethanol and isobutanol in sugar refineries.
- **Aim:**
  - Blend with diesel to create a cleaner-burning fuel, reduce crude oil imports, and contribute to net-zero 2070 goals.
  - Provide new avenue for surplus ethanol feedstock utilization, supporting sugar sector viability.
- **Key Features:**
  - **Higher Flash Point:** Safer than ethanol for diesel blending as it is less volatile and reduces fire risk.
  - **Better Miscibility:** Blends more uniformly with diesel without extra additives (unlike ethanol).
  - **Energy-Dense:** Higher calorific value than ethanol → improved fuel efficiency.
  - **Flexible Production:** Can be co-produced with ethanol using existing infrastructure with minor modifications.
  - **Emission Benefits:** Potential to lower particulate emissions and reduce carbon intensity.
- **Applications:**
  - **Biofuel Blend:** Up to 10% blend with diesel (recommended) for transport sector.
  - **Solvent Industry:** Used in paints, coatings, chemical synthesis.
  - **Aviation & Marine Fuel:** Research ongoing for future sustainable fuel use.
  - **Feedstock for Chemicals:** Can be converted to jet fuel, plastics, and rubber intermediates.
- **Limitations:**
  - **Low Cetane Number:** Reduces ignition quality, may cause knocking unless additives are used.
  - **Engine Compatibility:** Over 10% blend may impact engine performance and durability.
  - **Incremental Cost:** Additives and blending infrastructure upgrades raise costs.
  - **Miscibility Concerns:** Needs biodiesel as co-solvent for full homogeneity.

AQUAMONITRIX - PORTABLE ION CHROMATOGRAPH

Context:

A team of scientists from the University of Tasmania has developed a portable ion chromatograph, Aquamonitrix, that allows real-time, on-site detection of nitrate and nitrite levels.

About Aquamonitrix - Portable Ion Chromatograph:

- **What It Is?**
  - A compact, low-pressure ion chromatograph that can separate and detect anions (like nitrate and nitrite) in real-time, outside traditional laboratory settings.
- **Developed By:** University of Tasmania researchers in collaboration with **Aquamonitrix**, a company specializing in field-deployable ion analysis instruments.
- **How It Works?**
  - **Sample Prep:** Soil pore water is extracted with a portable vacuum pump and filtered on-site.

- **Separation:** The device uses a **short chromatographic column** and **sodium chloride solution** as a carrier.
- **Detection:** Equipped with a UV absorbance detector, it produces two clear peaks for nitrate and nitrite without interference from other anions.
- **Power:** Runs on battery, enabling field portability.

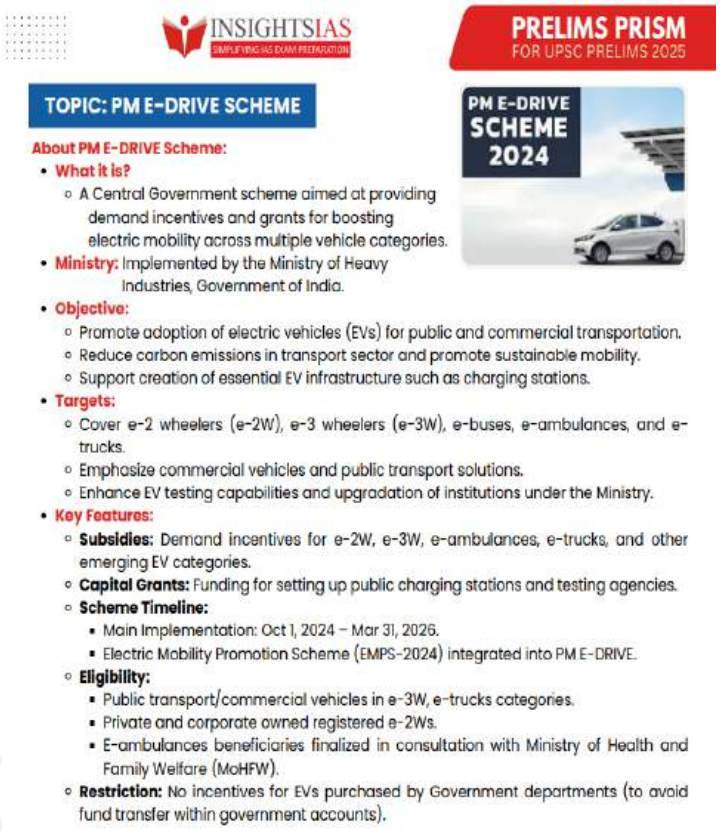
- **Key Features:**
  - **Low-Pressure System:** Simple, cost-effective, and safe for students to use.
  - **Environment-Friendly:** Uses sodium chloride solution instead of hazardous eluent mixtures.
  - **Compact & Battery-Operated:** Ideal for field studies and continuous monitoring.
  - **User-Friendly:** Designed for undergraduates with minimal training.
- **Applications:**
  - **Educational Tool:** Hands-on learning for chemistry students — bridging theory and real-world practice.
  - **Environmental Monitoring:** On-site measurement of nitrogen cycle components (nitrate, nitrite, ammonia).
  - **Research:** Long-term monitoring in greenhouses, rivers, and water treatment plants.
  - **Future Potential:** Expansion to detect **arsenic**, useful for groundwater quality assessment in India & Bangladesh.

Climate Change

GOVERNMENT GUIDELINES FOR EV CHARGING STATIONS

Context:

The Centre has issued fresh guidelines for setting up 72,300 public EV charging stations across India with ₹2,000 crore support under the PM E-DRIVE scheme.



About Government Guidelines for EV Charging Stations:

What it is?

- A policy framework unveiled by the Ministry of Heavy Industries to accelerate installation of public EV charging infrastructure across India.

Under Scheme:

- Implemented under the **₹10,900 crore PM E-DRIVE scheme**, with BHEL designated as the Project Implementation Agency (PIA).

Aim:

- To expand India's EV ecosystem by building an accessible and affordable charging network.
- To reduce range anxiety, promote clean mobility, and align with India's **net-zero targets**.

Key Features:

1. **Subsidy Support:**
   - 100% subsidy for charging stations in govt premises, schools, hospitals, residential colonies (with free public access).
   - 80% subsidy on infrastructure and 70% on charging equipment at high-traffic sites like airports, metro hubs, toll plazas, oil PSUs.
   - 80% subsidy for shopping malls, highway outlets, and battery-swapping stations.
2. **Priority Locations:**
   - Cities with **population above 1 million**, **state capitals, smart cities, metro-linked towns**, and **high-density corridors**.
   - Public transport hubs (railway stations,

airports, bus depots, fuel stations).

3. **Implementation Mechanism:**
    - Nodal agencies to **aggregate demand**, identify sites, and submit proposals via a dedicated portal.
    - Subsidy released in two phases tied to **compliance and performance benchmarks**.
4. **Coverage:**
    - National rollout targeting **72,300 charging stations** with ₹2,000 crore support.

Renewable Energy

2G ETHANOL

Context:
India allowed the export of 2G ethanol, with mandatory export licenses and feedstock certificates.

About 2G Ethanol:

What it is?

- 2G (Second-Generation) ethanol is an advanced biofuel made from non-food, lignocellulosic biomass such as agricultural residues, forestry waste, woody biomass, algae, and municipal solid waste.
- Unlike **1G ethanol** (from edible crops like sugarcane, maize), 2G uses waste materials, ensuring food security and sustainable fuel use.

How it is formed?

- **Feedstock:** Crop residues (rice/wheat straw, bagasse, corn stover), grasses, algae, wood chips.
- **Pretreatment:** Mechanical/thermal/chemical processes break rigid plant cell walls.
- **Hydrolysis:** Enzymes (cellulases) release fermentable sugars from cellulose & hemicellulose.
- **Fermentation:** Microorganisms (wild or genetically engineered yeasts) convert sugars into ethanol.
- **Distillation & purification:** Produces bioethanol fit for blending or industrial use.

Features of 2G Ethanol:

- **Sustainable:** Uses agricultural & forestry residues, reducing stubble burning and food-waste.
- **Low-carbon fuel:** Cuts **GHG emissions by 85–108%** compared to gasoline.
- **Non-food based:** Prevents diversion of food crops, easing food vs fuel debate.
- **Scalable potential:** Can use **62 MMT of municipal waste in India annually**.
- **Policy-driven:** Supported by **India's E20 blending target (2030 achieved early in 2025)**.

Applications:

- **Transport sector:** Blending with petrol (reduces crude import dependence).
- **Aviation biofuel:** Potential for green aviation fuel (long-term).
- **Industrial solvents:** Used in pharma, chemicals, and beverage sectors.
- **Environmental management:** Helps curb **stubble burning & waste accumulation**.

INDIA'S FIRST BAMBOO-BASED ETHANOL PLANT IN ASSAM

Context:
Prime Minister of India inaugurated India's first bamboo-based ethanol plant at Numaligarh Refinery, Golaghat, Assam, and laid the foundation stone of a polypropylene plant.

About India's First Bamboo-Based Ethanol Plant in Assam:

What it is?

- A **bioethanol plant** that converts bamboo biomass into **2G ethanol**, a renewable alternative to fossil fuels.
- Part of India's **National Bio-Energy Mission** and **Ethanol Blending Programme (EBP)** to achieve **20% ethanol blending by 2025**.

Developed by:

- Assam Bio-Ethanol Private Limited (ABEL) in collaboration with Numaligarh Refinery Ltd (NRL)

under the Ministry of Petroleum & Natural Gas.

Aim:

- To reduce crude oil imports by producing **ethanol locally** from bamboo.
- To boost **bamboo cultivation** in the Northeast, creating an assured market for farmers.
- To promote **circular economy and energy security** through waste-to-fuel technology.

Key Features:

- **Feedstock:** Utilises bamboo biomass, which grows abundantly in Assam and NE states.
- **Capacity:** Produces **60,000 KL of ethanol annually** for blending with petrol.
- **Technology:** Advanced 2G bio-refinery using **enzymatic hydrolysis and fermentation** process.
- **Sustainability:** Reduces GHG emissions and prevents stubble/bamboo waste burning.
- **Livelihood:** Creates thousands of jobs in bamboo cultivation, collection, transport, and processing.

Significance:

- **Energy Security:** Reduces dependence on imported crude oil, saving ₹1,000+ crore annually.
- **Farmer Empowerment:** Provides steady income through bamboo procurement contracts.
- **Green Economy:** Contributes to India's **Net Zero 2070** commitment and biofuel roadmap.

INDIA'S FIRST PORT-BASED GREEN HYDROGEN PILOT PROJECT AT V.O. CHIDAMBARANAR (VOC) PORT

Context:

Union Minister inaugurated India's first port-based Green Hydrogen Pilot Project at V.O. Chidambaranar (VOC) Port, Tamil Nadu, making it the first port in the country to produce green hydrogen.

About India's first port-based Green Hydrogen Pilot Project at V.O. Chidambaranar (VOC) Port:

India's First Port-Based Green Hydrogen Pilot Project

- **What it is?**
  - A pilot facility producing **green hydrogen** at VOC Port, Tuticorin.
  - **Capacity:** 10 Nm^3 per hour, set up at a cost of **₹3.87 crore**.
- **Under Scheme:**
  - Part of India's clean energy transition and **Coastal Green Shipping Corridor project** (Kandla–Tuticorin).
  - Aligned with **Viksit Bharat 2047 mission** and Sagarmala programme.
- **Aim:**
  - To promote **green shipping, sustainability, and self-reliance** in energy.
  - Reduce reliance on fossil fuels in port operations.
  - Make VOC Port a hub for **green bunkering and refuelling** in South India.
- **Features:**
  - Will power **streetlights and EV charging stations** in the port colony.
  - Linked with proposed **Green Methanol Bunkering and Refuelling Facility** (₹35.34 crore, 750 m^3 capacity).

About V.O. Chidambaranar Port:

- **What it is?**
  - One of India's **13 major ports**, a leading maritime hub for South India.
- **Located in:** Tuticorin, Tamil Nadu, on the Coromandel Coast of the Bay of Bengal.
- **History:**
  - Formerly known as **Tuticorin Port**, renamed in honour of **freedom fighter V.O. Chidambaranar** (the "Kappalottiya Tamizhan") in 2011.
  - Plays a key role in **regional trade, coal handling, and container movement**.
  - Has witnessed significant expansion under **Sagarmala**, with investments of over ₹16,000 crore in modernisation.

Indian Laws/Schemes/Acts

SUSTAINABLE MOUNTAIN DEVELOPMENT SUMMIT (SMDS)

Context:
The 12th Sustainable Mountain Development Summit (SMDS-XII) began at Doon University, Dehradun.

About Sustainable Mountain Development Summit (SMDS):

- **What it is?**
  - A **flagship annual summit** that addresses ecological, economic, and social challenges of the **Indian Himalayan Region (IHR)**.
  - Acts as a multi-stakeholder platform for dialogue, knowledge sharing, and policy recommendations.
- **Organised by:** Conducted by the **Integrated Mountain Initiative (IMI)**, a civil society-led network.
- **Origin:** First held in 2011 at Nainital, Uttarakhand (SMDS-I).
- **Aim:**
  - Promote sustainable development in ecologically fragile Himalayan ecosystems.
  - Strengthen community participation in governance and policy-making.
  - Blend science and traditional wisdom for resilience against climate change.
  - Mainstream mountain concerns into India's national and global development agenda.
- **Features:**
  - **Mountain Legislators' Meet (MLM):** Policy dialogue with elected representatives from IHR states.
  - **Indian Himalayan Youth Summit:** Platform for youth to voice challenges and solutions.
  - **Knowledge sessions:** Cover agroecology, disaster management, sustainable tourism, and climate adaptation.
  - **Cross-sector participation:** Involves scientists, farmers, NGOs, academicians, and government officials.
- **Significance:**
  - **Policy impact:** Provides actionable recommendations influencing state and central policies.
  - **Climate resilience:** Encourages adoption of traditional farming, organic practices, and disaster preparedness.

NATIONAL POLICY ON GEOTHERMAL ENERGY 2025

Context:
MNRE launched the National Policy on Geothermal Energy (2025) to accelerate exploration and deployment of geothermal energy resources.

About National Policy on Geothermal Energy 2025:

What It Is?

- A **comprehensive framework** issued by the Ministry of New & Renewable Energy (MNRE) to harness India's **10 GW geothermal potential**, integrate it with renewable energy goals, and build a **public-private ecosystem** for sustainable development.

Launched By: Ministry of New and Renewable Energy (MNRE)

Objectives:

- **Research & Innovation:** Improve geothermal exploration, drilling, reservoir management, cost-effective power generation, and direct-use tech.
- **Collaboration:** Work with ministries, research institutes, global geothermal agencies, and oil/gas sector.
- **Decarbonization:** Promote geothermal for space heating/cooling, industry, agriculture, and tourism.
- **Infrastructure Utilization:** Repurpose abandoned oil & gas wells for geothermal production.

Key Features:

- **Vision & Goals:**
  - Make geothermal a **major pillar of India's renewable energy mix**.

- Enhance energy security and support **Net Zero by 2070**.

- **Geothermal Potential:**
  - **381 hot springs** identified by GSI; 10 geothermal provinces including Himalayas, Cambay Graben, Godavari Basin, Aravalli.
  - **Puga (Ladakh), Manikaran (HP), Tattapani (Chhattisgarh)** highlighted as high-potential zones.
- **Scope of the Policy:**
  - Covers **electricity generation**, **district heating/cooling**, cold storage, greenhouse heating, aquaculture, tourism, desalination.
  - Encourages **hybrid systems** (geothermal + solar) and **mineral extraction** (lithium, boron) for economic viability.
- **Development Model:**
  - 100% FDI permitted in geothermal sector.
  - Promotes **risk-sharing mechanisms**, **joint ventures** with oil & gas companies, and **single-window clearance** by states.
  - **Fiscal incentives:** GST & import duty exemptions, tax holidays, accelerated depreciation, viability gap funding.

Implementation:

- **MNRE as nodal agency** with inter-ministerial coordination.
- Establishment of **Geothermal Centres of Excellence** for R&D and pilot projects.
- Periodic progress reports and SOP-based execution for faster rollout.

LEGAL PROVISIONS FOR ACQUISITION OF ANIMALS

Context:

The Supreme Court-appointed SIT has found no statutory irregularities in Reliance-owned Vantara's acquisition of animals, affirming compliance with all wildlife and trade laws.

About Wildlife (Protection) Act, 1972:

- **What it is?**
  - A comprehensive legislation enacted by Parliament to protect India's wildlife, habitats, and regulate human-wildlife interaction. It provides a legal framework for the protection of endangered species and creation of protected areas.
- **Aim:**
  - To ensure the **protection of wild animals, birds, and plants**.
  - To maintain ecological and environmental security by preventing extinction of species.
  - To regulate hunting, trade, and possession of wildlife products.
- **Key Features:**
  - **Six Schedules** (I–VI) classifying species based on protection level (Schedule I & II provide absolute protection; Schedule VI regulates cultivation of certain plants).

    Note: It has been amended into 4 schedules by Wildlife (Protection) Act, 2022.
  - **Creation of Protected Areas:** National Parks, Wildlife Sanctuaries, Conservation Reserves, Community Reserves.
  - **Regulation of Hunting:** Complete ban on hunting of endangered species; permits only for special purposes like scientific research or population control.
  - **Wildlife Crime Control Bureau (WCCB):** Established to fight wildlife crimes and illegal trade.
  - **Zoo Regulation:** Chapter IV-A provides for recognition, management, and regulation of zoos through the Central Zoo Authority.
  - **Penalties:** Stringent fines and imprisonment for offences, especially involving Schedule I animals.

About Legal Provision for Acquisition of Animals:

- **What the Law Says:**
  - **Section 40 & 42** of the Wildlife (Protection) Act require any person acquiring, possessing, or transferring a scheduled wild animal (or article) to seek **prior permission** from the Chief Wildlife Warden (CWW).
  - **Section 43** prohibits transfer by sale or offer unless with CWW permission.
  - **Section 49 & 49B** regulate trade and transport of scheduled animals, ensuring they are not procured illegally or smuggled.
- **Process for Acquisition:**
  - **Application:** Individual/organisation applies to CWW specifying species, purpose, and source.
  - **Verification:** Authority verifies legality of

source (domestic zoo, rescue centre, or permitted foreign institution).

- **Permit/License:** Permit issued under Zoo Rules, 2009 (for recognised zoos) or under international agreements like **CITES** for imports/exports.
- **Transport & Quarantine:** Transport must comply with IATA Live Animal Regulations; post-arrival, animals undergo veterinary quarantine.
- **Reporting & Record-Keeping:** Acquirer must maintain inventory and submit records to authorities periodically.

ENVIRONMENT AUDITORS

Context:

The Centre has approved the creation of a new, independent class of "environment auditors" under the Environment Audit Rules, 2025, to supplement State Pollution Control Boards.

About Environment Auditors:

- **What it is?**
  - A newly created category of certified professionals or accredited agencies authorised to inspect, verify, and audit industrial and infrastructure projects for compliance with environmental laws and sustainability norms.
- **Established Under:** The **Environment Audit Rules, 2025**, notified by the Ministry of Environment, Forest and Climate Change on **August 29, 2025**.
- **Aim:**
  - To **bridge manpower and infrastructure deficits** faced by Central/State Pollution Control Boards.
  - To promote **self-compliance and accountability** among project developers.
  - To ensure **greater transparency and credibility** in environmental monitoring.
- **Functions:**
  - Conduct systematic audits of projects governed by environmental laws.
  - Sample and analyse emissions, effluents, and waste.
  - Report non-compliance and compute environmental compensation.
  - Act as verifiers under **Green Credit Rules, E-Waste Rules, Plastic Waste Rules**.
  - Provide independent inputs for **climate action and ESG ratings**.
- **Significance:**
  - Strengthens India's **environmental governance** beyond government machinery.
  - Reduces monitoring burden on State/ Central Boards.

GOVERNMENT METHODOLOGY FOR CALCULATING GREEN CREDIT (TREE PLANTATION)

Context:

The Environment Ministry released a revised methodology for calculating Green Credit for tree plantation.

About Government Methodology for Calculating Green Credit (Tree Plantation):

- **What it is?**
  - *Green Credit* is a **market-based incentive mechanism** under the **Green Credit Programme (launched Oct 2023)** to reward voluntary eco-friendly actions like tree plantation, mangrove restoration, sustainable farming, water conservation, and waste management.
  - Credits act as measurable rewards for positive environmental outcomes.

- **Aim:**
  - Encourage **voluntary participation** of industries, cooperatives, and communities in ecological restoration.
  - Shift from **tree-counting** to **ecological improvement** (survival + canopy density).
  - Link corporate obligations (CSR, afforestation compliance) with long-term ecological benefits.
- **Key Features (2025 notification):**
  - Credits awarded **only after 5 years** of restoration, ensuring tree survival and growth.
  - **40% minimum canopy density** required for issuance.
  - **1 Green Credit = 1 tree surviving beyond 5 years.**
  - Credits are **non-tradable & non-transferable**, except within holding–subsidiary companies.
  - Can be exchanged **once only** for compensatory afforestation, CSR compliance, or project-linked obligations; extinguished after use.
  - Verification by **designated agencies**, with applicant paying a verification fee.
  - Projects initiated under 2024 rules will continue under old provisions.
- **Significance:**
  - Ensures **long-term survival** and ecological impact, not just plantation numbers.
  - Encourages **quality afforestation and forest restoration** on degraded land.
  - Helps companies meet **CSR, ESG, and legal compliance** through scientifically verified credits.

International Policies/Efforts

COLD DESERT BIOSPHERE RESERVE INCLUDED IN UNESCO'S WORLD NETWORK OF BIOSPHERE RESERVES

Context:

India's Cold Desert Biosphere Reserve (Himachal Pradesh) has been included in UNESCO's World Network of Biosphere Reserves (WNBR) at the 37th ICC-MAB session.

INDIAN BIOSPHERE RESERVES IN UNESCO'S WNBR:

YEAR OF RECOGNITION	BIOSPHERE RESERVE	STATE(S)
2000	Nilgiri	Tamil Nadu, Kerala, Karnataka
2001	Sundarbans	West Bengal
2001	Gulf of Mannar	Tamil Nadu
2004	Nanda Devi	Uttarakhand
2009	Nokrek	Meghalaya
2009	Similipal	Odisha
2009	Pachmarhi	Madhya Pradesh
2012	Achanakmar-Amarkantak	Madhya Pradesh, Chhattisgarh
2013	Great Nicobar	Andaman & Nicobar Islands
2016	Agasthyamalai	Kerala, Tamil Nadu
2018	Khangchendzonga	Sikkim
2020	Panna	Madhya Pradesh
2025	Cold Desert	Himachal Pradesh

About Cold Desert Biosphere Reserve included in UNESCO's World Network of Biosphere Reserves:

- **What it is?**
  - A **high-altitude biosphere reserve** (7,770 sq km) in Himachal Pradesh's Trans-Himalayan region, integrating **Pin Valley National Park, Kibber Wildlife Sanctuary, Chandratal Wetland** and surrounding areas.
  - It is zoned into **core, buffer, and transition areas** balancing conservation and community livelihoods.
- **Located in:**
  - **Lahaul-Spiti district, Himachal Pradesh**
  - **Altitude:** 3,300–6,600 m
  - **Terrain:** windswept plateaus, glacial valleys, alpine lakes, and high-altitude desert ecosystems
- **History:**
  - **Established in 2009** as a Cold Desert Biosphere Reserve.
  - Included in **UNESCO's WNBR in 2025**, becoming **India's first high-altitude cold desert site** in the global network.
- **Features**
  - **Flora**: 655 herbs, 41 shrubs, 17 tree species.
    - Includes **14 endemics** and **47 medicinal plants** vital for **Sowa Rigpa/Amchi** healing tradition.
  - **Fauna:** 17 mammals, 119 birds.
    - **Flagship species:** Snow Leopard, Himalayan wolf, Tibetan antelope, Himalayan ibex.

- **Communities:** ~12,000 residents engaged in pastoralism, yak/goat herding, barley & pea farming, Tibetan herbal medicine.
- **Zonation:** Core (2,665 sq km), Buffer (3,977 sq km), Transition (1,128 sq km).
- **Climate:** One of the **coldest and driest ecosystems** in UNESCO's WNBR.

- **Indian and UNESCO World Network of Biosphere Reserves:**
  - India has **18 biosphere reserves**, of which **13 are now in WNBR**.
  - **Globally: 785 sites in 142 countries** and UNESCO added **26 new reserves in 2025** – highest in 20 years.
- **Significance:**
  - **Global recognition:** Enhances India's role in biodiversity conservation and sustainable mountain ecosystem management.
  - **Research hub:** Serves as a **"living laboratory"** for international scientific collaboration.

UNEP YOUNG CHAMPIONS OF THE EARTH AWARD 2025

Context:
UNEP announced the 2025 Young Champions of the Earth award, recognising innovators from India, Kenya, and the US.

About UNEP Young Champions of the Earth Award 2025:

What it is?

- UNEP's **flagship youth engagement award**, recognising young entrepreneurs under 30 with bold environmental solutions.

Launched in:

- Established in **2017**, relaunched in **2025** in partnership with Planet A (founded by US cleantech CEO Chris Kemper).

Given by: United Nations Environment Programme (UNEP), supported by philanthropic and private partners.

Aim: To empower young innovators tackling the triple planetary crisis of climate change, biodiversity loss, and pollution/waste.

Eligibility:

- Open to **individuals below 30 years**, offering recognition, funding, and mentoring for projects with **scalable environmental impact.**

Features:

- Winners receive **USD 20,000 seed funding**, intensive training, tailored mentorship, global recognition, and access to **Planet A pitch** for further funding (up to **USD 1 million**).

2025 Winners:

- **Jinali Mody (India)** – Founder of **Banofi Leather**: Produces eco-friendly leather from banana crop waste, reducing water use, chemical pollution, and carbon emissions.
- **Joseph Nguthiru (Kenya)** – Founder of **HyaPak**: Converts invasive **water hyacinth** into biodegradable packaging and seedling wrappers, reducing single-use plastics.
- **Noemi Florea (US)** – Founder of **Cycleau**: Developed a **compact greywater reuse system** for households, turning wastewater into drinking water with low energy consumption.

Miscellaneous

AI-ENABLED CENTRE AT BETLA NATIONAL PARK

Source: NIE

Context: Betla National Park, Jharkhand, will host India's first AI-enabled nature experience centre.

- It will use AI, AR/VR, holograms, and immersive sound to simulate real jungle life.

About AI-enabled Centre at Betla National Park:

- **What it is?**
  - A high-tech nature interpretation and experience hub inside Palamu Tiger Reserve (PTR).

- Designed to recreate wildlife movements, sounds, and natural ecosystem dynamics.

- **Developed by:** Palamu Tiger Reserve (PTR) authorities, led by Deputy Director Prajesh Kant Jena.
- **Features:**
  - **AI Assistants** for guided learning.
  - **3D holographic projections** to display lifelike animals.
  - **Augmented reality & immersive sound effects** (waterfalls, bird calls, animal hunts).
  - Simulation of **ecosystem behaviours** like food-sharing, herd movement, predator-prey interactions.
- **Function:**
  - Enhances **eco-tourism and education** in PTR.
  - Provides **interactive conservation awareness**.
  - Supports researchers with **virtual wildlife observation tools**.

About Betla National Park:

- **What it is?**
  - The only National Park of Jharkhand, known for its rich flora and fauna.
  - Famous for **elephant rides, jeep safaris, waterfalls, and tribal eco-tourism.**
  - Forms the core area of Palamau Tiger Reserve.
- **Located in:** Situated in **Latehar district, Jharkhand**, about **170 km from Ranchi**.
- **History:**
  - Notified as a **National Park in 1986**.
  - Part of **Palamau Tiger Reserve** (**Total area:** 1129.93 sq. km).
  - Among the **first nine tiger reserves** established under **Project Tiger (1973)**.
  - Developed as the **main tourism hub of Palamau Tiger Reserve** with elephant rides and jeep safaris.

GREY RHINO EVENT

Context:

Kerala's Wayanad landslide (July 2024) has been described as a "grey rhino event" by scientists in the report *Sliding Earth, Scattered Lives* (Sept 2025), highlighting how policymakers ignored years of warnings about ecological fragility and rainfall risks.

About Grey Rhino Event:

What it is?

- A **"grey rhino"** is a **highly probable, high-impact event** that is visible and foreseeable but often neglected until it causes catastrophic damage.
- It contrasts with **"black swan events"** (rare, unpredictable) and focuses on **obvious but ignored risks**.

Concept Developed by:

- Coined by **Michele Wucker**, a U.S.-based policy analyst, in her 2016 book *The Gray Rhino: How to Recognize and Act on the Obvious Dangers We Ignore*.

Key Features:

- **Predictable:** The risk is known and well-documented (e.g., ESA reports flagged Wayanad slopes as unstable).
- **Visible:** Early warning signs are apparent (e.g., heavy rainfall exceeding 600 mm in 48 hrs was modeled as a trigger).
- **Neglected:** Authorities fail to act due to complacency, politics, or economic interests.
- **High-Impact:** When triggered, it causes large-scale social, economic, and environmental damage.
- **Actionable:** Unlike black swans, preventive action is possible if timely measures are taken.

Significance:

- **Risk Governance:** Helps policymakers identify and prioritise visible but under-addressed threats.
- **Disaster Preparedness:** Promotes proactive planning—early evacuation, strict zoning laws, and eco-sensitive development.

SCIENCE AND TECHNOLOGY

Chemistry

ALUMINIUM

Context:

India's aluminium industry is under stress due to a rapid shift from aluminium to UPVC plastic in construction and rising cheap imports from ASEAN countries.

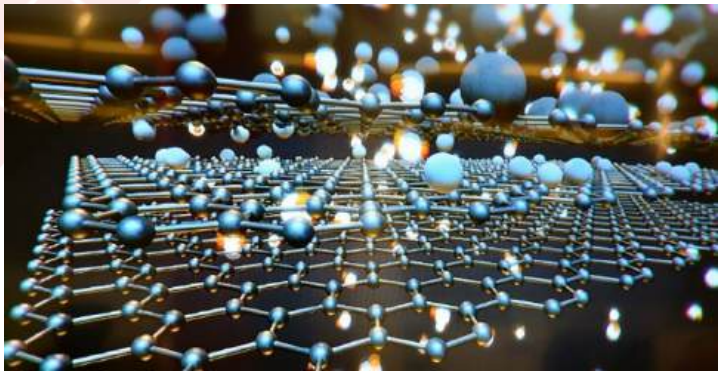
About Aluminium:

- **What it is?**
  - Aluminium is widely used for making **window frames, kitchen items, doors, roofs, and automotive parts**.
  - It is increasingly being replaced by **UPVC plastic**, which is derived from crude oil and raises environmental concerns under India's Paris Agreement commitments.
- **India's Status (Production, Imports & Exports)**
  - **Installed capacity** of aluminium extrusion industry: **3 million tonnes per annum**.
  - **Actual utilisation:** only **1.2 million tonnes**.
  - **Imports:** exceed **1.5 million tonnes**, driven by **price differences, FTA concessions, and duty-free access** under various HSN codes.
  - **Consumption:** India's per capita aluminium consumption is **~4 kg**, among the lowest globally, compared to **China (25 kg)**, **US (18 kg)**, and **world average (11 kg)**.
- **Importance of Aluminium in Industry:**
  - Critical for **construction sector**: doors, windows, facades, and structural applications.
  - Important for the **automotive industry**, which is shifting towards lightweight materials.
  - Plays a role in **renewable energy expansion**, especially solar.
  - India's **low aluminium consumption** limits the growth of the domestic industry despite high potential demand.
- **Raw Materials in India:**
  - India has significant **bauxite reserves**, the primary ore for aluminium production.
  - **Major producing states:**
    - **Odisha** – largest producer; major mines in Koraput, Kalahandi, Rayagada, Sundergarh (NALCO's Panchpatmali mines).
    - **Jharkhand** – deposits in Lohardaga, Gumla, Ranchi (Hindalco operations).
    - **Gujarat** – reserves in Jamnagar, Kutch, Junagadh.
    - **Chhattisgarh** – deposits in Bilaspur, Durg, Amarkantak plateau.
    - **Maharashtra** – Kolhapur district.
    - **Madhya Pradesh** – Amarkantak plateau, Maikala range.

2D MATERIALS

Context:

NITI Aayog's Frontier Tech Hub, in collaboration with IISc Bengaluru, has released the 4th edition of its **Future Front Quarterly Insights** titled "Introduction to 2D Materials", highlighting their significance and why India must prioritise them.



About 2D Materials:

What are 2D Materials?

- **Definition:** These are super-thin materials, only **one atom thick** — thinner than anything you can imagine. Example: **graphene, MoS_2 (molybdenum disulfide), WS_2.**
- **Structure:** They are flat like a sheet of paper but at the atomic level, giving them special properties that normal (3D) materials don't have.
- **Discovery:** In 2004, scientists peeled off **graphene** from graphite (pencil lead) using tape — this earned them the **2010 Nobel Prize**.
- **Types:** Graphene (made of carbon), TMDCs (metal + sulfur/selenium), **hexagonal boron nitride (h-BN)**, and new materials called **"Xenes"** like silicene.

How Do They Work?

- Because they're so **thin**, electrons can move almost freely → **faster and cooler devices**.
- They're held together strongly within a sheet but are weakly stacked, so we can easily separate them into thin layers.
- Their **energy properties (band gap)** can be adjusted, making them great for chips and electronics.
- Their thinness makes them extremely **sensitive to the environment** — perfect for sensors.
- They also show **quantum effects** (like spin–valley coupling) that could power future **quantum computers**.

Key Characteristics:

- **Super Conductors** → Graphene carries electricity better than copper and also spreads heat quickly.
- **Super Strong** → Around **200 times stronger than steel**, yet bendable and stretchable by 20%.
- **Tunable Chips** → Can be engineered for next-generation semiconductors beyond today's silicon.
- **Quantum Ready** → Can host quantum bits (qubits) for **quantum computing**.
- **Flexible & Transparent** → Ideal for foldable phones, wearable gadgets, and see-through electronics.

Applications:

- **Semiconductors** – 2D transistors (MoS_2, WS_2) break silicon limits; extend Moore's Law to the angstrom era.
- **Neuromorphic Computing** – Atom-thin memristors mimic brain synapses; energy-efficient AI hardware.
- **Optoelectronics** – Tunable band gaps enable ultra-thin photodetectors, LEDs, and solar cells.
- **Bulk Uses** – Graphene composites for aerospace, water filtration membranes, coatings, batteries, and EV supercapacitors.

Biotechnology

EVO AI MODEL

Context:

Stanford University scientists, with the Arc Institute, have used AI (Evo) to design new viruses that kill harmful bacteria.

About Evo AI Model:

- **What It Is?**
  - **Foundation Model for Genomics:** Evo is a large AI model trained on microbial and viral genetic sequences.
  - Functions like a "ChatGPT for DNA," predicting, designing, and generating genetic code for synthetic biology applications.
- **Developed By:** Stanford University and Arc Institute.
- **Aim & Purpose:**
  - **Design Therapeutic Viruses:** Create bacteriophages to fight drug-resistant infections.
  - **Understand Mutations:** Predict how DNA mutations impact protein function and disease.
  - **Accelerate Innovation:** Replace slow trial-and-error lab work with AI-driven design.
- **How It Works?**
  - **Training:** Learned from 80,000 microbial genomes and millions of bacteriophage/plasmid sequences (≈300 billion nucleotides).
  - **Pattern Recognition:** Identifies how genes interact, predicts functional mutations.
  - **Generative Design:** Creates novel viral blueprints, proteins (e.g., Cas9 variants), and genome-scale constructs.
  - **Validation:** Designs are synthesized and tested in labs to confirm biological activity.
- **Key Features:**
  - **Extended Context Length:** Understands long DNA sequences and gene interactions.
  - **Nucleotide-Level Resolution:** High precision at the level of individual base pairs.
  - **Generative Capability:** Can propose new protein variants and synthetic genomes.
  - **Faster R&D:** Reduces decades of research to weeks, cutting cost and time.
  - **Open Research:** Publicly available for non-commercial academic research.

MULTI-STAGE MALARIA VACCINE ADFALCIVAX

Context:

The Union government has granted licences to five Indian firms to manufacture and commercialise AdFalciVax, the country's first indigenous multi-stage malaria vaccine developed by ICMR.

About Multi-Stage Malaria Vaccine AdFalciVax:

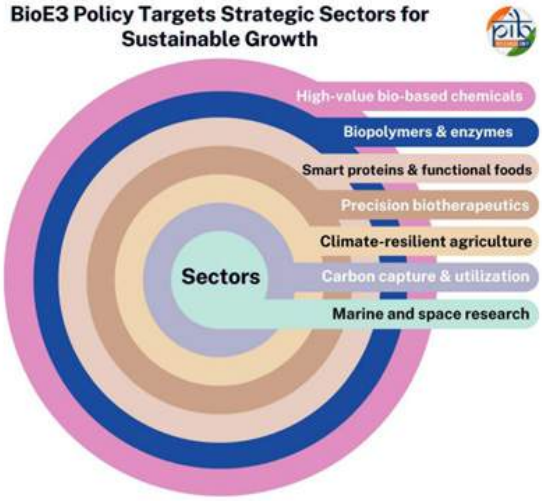
- **What it is?**
  - India's first indigenous **recombinant chimeric multi-stage malaria vaccine** designed to block infection and transmission of *Plasmodium falciparum*, the deadliest malaria parasite.
- **Developed by:**
  - ICMR–Regional Medical Research Centre (RMRC), Bhubaneswar, with support from ICMR–National Institute of Malaria Research (NIMR) and National Institute of Immunology (NII), New Delhi.
- **Aim:**
  - To prevent infection in individuals and minimise **community transmission of malaria**, thereby aiding elimination goals.
- **Key Features:**
  - Targets parasite *before it enters the bloodstream*.
  - **Affordable, scalable, and stable** → effective for over nine months at room temperature.
  - **Multi-stage action** ensures protection at both infection and transmission stages.
  - Successfully validated in **pre-clinical trials**.
- **New Firms Licensed (2025):**
  - Indian Immunologicals Ltd, Techinvention Lifecare Pvt. Ltd, Panacea Biotec Ltd, Biological E Ltd, Zydus Lifesciences.
- **Significance:**
  - India carries 1.4% of global malaria cases and 66% of Southeast Asia's burden.
  - Boosts Atmanirbhar Bharat in health R&D by indigenising vaccine technology.
  - Reduces dependence on imported vaccines and aligns with India's Malaria Elimination Goal 2030.

HIGH PERFORMANCE BIOMANUFACTURING PLATFORMS

Context:

The Department of Biotechnology (DBT) and Biotechnology Industry Research Assistance Council (BIRAC) launched High-Performance Biomanufacturing Platforms in New Delhi under the BioE3 Policy.

The policy's scope is broad and ambitious, encompassing several strategic sectors:



About High Performance Biomanufacturing Platforms:

What it is?

- A **national network of advanced bio-foundries and biomanufacturing hubs**.
- Provides **world-class tools, technologies, and infrastructure** to scale bio-based innovations from lab to production.

Minister: Launched by **Union Minister of State for Science & Technology, Jitendra Singh**.

Aim:

- To **accelerate biomanufacturing**, reduce reliance on imports, foster green growth, and build a **multi-trillion-dollar bioeconomy by 2047**.
- Support **start-ups, SMEs, academia, and industry** in biotechnology innovation and commercialization.

Features:

- **21 bio-enablers** under the BioE3 policy.
- Covers areas such as:
  - Microbial strains & smart proteins
  - Probiotics & bio-based chemicals
  - Cell therapies & mRNA-based medicines
  - Marine bio-innovations & sustainable biofuels
- Aligns with **climate commitments and Atmanirbhar Bharat** vision.
- Facilitates **employment generation** and capacity building.

Significance:

- **Economic**: Positions India as a **global bioeconomy leader**; accounts for nearly **one-fifth of global capacity**.
- **Strategic**: Reduces dependence on imports, strengthens **self-reliance in biotech**.
- **Social**: Generates jobs, supports youth-led innovation, and creates a **Viksit Bharat by 2047**.

Health

PRAYAS NEURO REHABILITATION CENTRE

Context:

The Ministry of Ayush launched "Prayas", a first-of-its-kind Integrated Neuro-Rehabilitation Centre at AIIA Goa, marking a milestone in blending Ayurveda, Yoga, and modern therapies for paediatric neuro care.

About Prayas Neuro Rehabilitation Centre:

- **What is Prayas?**
  - **Integrated Centre:** It is a novel, multi-disciplinary **Neuro-Rehabilitation Centre** established to offer holistic, patient-centric care.
  - **Unique Combination:** It is among the first centres in India to unify **Ayurveda, Physiotherapy, Yoga, Speech Therapy, Occupational Therapy, and modern Paediatrics** under a single umbrella.
- **Host Institution:** All India Institute of Ayurveda (AIIA), Goa.
- **Launched By:** The Ministry of Ayush.
- **Aim and Function:**
  - Primarily focuses on providing comprehensive neuro-rehabilitation to **children (paediatric care)** with neurological and developmental conditions.
  - Aims to create **evidence-based solutions** by combining the best of traditional knowledge and modern rehabilitation sciences.
- **Functions:**
  - Deliver integrative patient-centred care for paediatric neurological challenges.
  - Combine traditional wisdom (Ayurveda, Yoga) with modern rehabilitation sciences.
  - Serve as a research and training hub for Ayush-based innovations in neuro care.
  - Act as a model of holistic healthcare aligned with India's National Health Policy.
  - Provide comprehensive family support through multidisciplinary therapies.

PARACETAMOL (TYLENOL)

Context:

U.S. President Donald Trump claimed that paracetamol (Tylenol) use during pregnancy is linked to autism.

- Experts, including former WHO Chief Scientist Soumya Swaminathan, dismissed the claim as unscientific.

About Paracetamol (Tylenol):

- **What it is?**
  - A **non-opioid analgesic** and **antipyretic drug**.
  - Known as **paracetamol** globally and **acetaminophen** in the U.S.
  - Listed in the **WHO's Essential Medicines** for safe and widespread use.
- **Ingredients Used:** Acetaminophen (paracetamol).
- **Used For:**
  - Relieves **mild to moderate pain** (headache, backache, arthritis, toothache, menstrual cramps, post-surgery pain).
  - Reduces **fever** in adults and children.
  - Preferred pain relief during **pregnancy** and for those who cannot tolerate NSAIDs (like ibuprofen, aspirin).

- **Features:**
  - **Safe short-term use** when taken as per dosage.
  - Available in **multiple forms**: tablets, syrups, chewables, dissolvable packs.
  - First-line treatment for **pain and fever in pregnancy**.
  - Can be combined with ibuprofen for enhanced pain relief.
- **Limitations:**
  - Less effective than NSAIDs for **inflammation-related pain** (e.g., arthritis).
  - **Excessive use** (above 3–4 g/day in adults) can cause **liver damage or failure**.
  - Limited effectiveness in **chronic pain** (e.g., osteoarthritis, cancer pain).

WHO MODEL LIST OF ESSENTIAL MEDICINES

Context:

The WHO has added GLP-1 receptor agonists (semaglutide, dulaglutide, liraglutide, tirzepatide) to its Model List of Essential Medicines (EML) for type-2 diabetes with comorbidities like obesity and cardiovascular/kidney disease.

About GLP-1 Drugs:

- **What It Is?**
  - **Glucagon-Like Peptide-1 (GLP-1) drugs** are medications that mimic the action of the natural GLP-1 hormone.
  - They belong to the class of **GLP-1 receptor agonists** (also called incretin mimetics).
- **Aim:**
  - **Primary:** Lower blood glucose in type-2 diabetes patients.
  - **Secondary:** Support weight loss, improve cardio-metabolic health, and reduce diabetes complications (heart/kidney).
- **Key Features:**
  - **Mode:** Mostly injectable (some oral versions available).
  - **Benefits:**
    - Improves insulin secretion, slows digestion, suppresses appetite.
    - Proven benefits for obesity management and metabolic health.

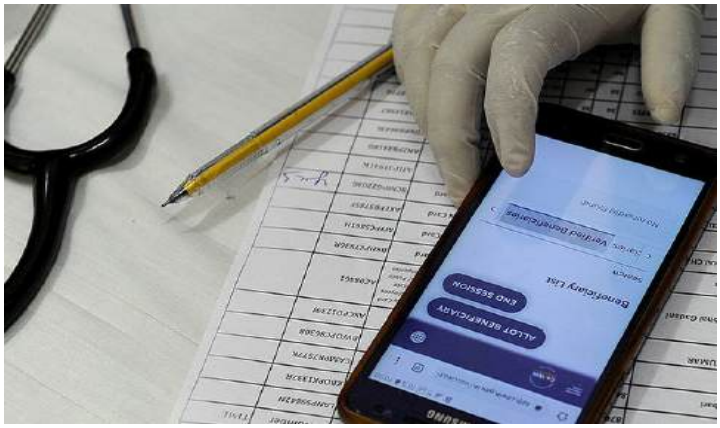
About WHO Model List of Essential Medicines (EML):

- **What It Is?**
  - A list of medicines considered **most effective, safe, and essential** for meeting priority health needs of a population.
- **Origin:**
  - First published by WHO in **1977** and updated every two years by the WHO Expert Committee.
  - **EML for Children** introduced in **2007**.
- **Aim:**
  - Guide countries in **selecting, procuring, and making medicines accessible** to all.
  - Promote **universal health coverage** by focusing on affordability and availability.
- **Key Features:**
  - **Evidence-based Selection:** Only drugs with proven efficacy, safety, and cost-effectiveness included.
  - **Global Benchmark:** Used by over 150 countries to frame their **national essential medicines lists (NEML)**.
  - **Dynamic List:** Updated biennially to reflect new therapeutic needs and scientific evidence.
  - **Impact on Pricing:** Encourages bulk procurement and generic production, driving prices lower.

COWIN PORTAL

Context:

The CoWIN portal, India's flagship digital platform for COVID-19 vaccination records, has been unavailable since early August 2025, blocking access to vaccination certificates.



About CoWIN Portal:

- **What it is?**
  - **CoWIN (COVID Vaccine Intelligence Network)** is a government digital platform for registration, scheduling, tracking, and certification of COVID-19 vaccinations.
  - It serves as an **end-to-end public health management tool** from the national to the vaccinator level.
- **Launched in:** January 2021, during India's COVID-19 vaccination drive.
- **Ministry:** Union Ministry of Health and Family Welfare (MoHFW).
- **Aim:**
  - To provide a **transparent, efficient, and real-time system** for vaccination delivery.
  - To ensure **equitable access, identity verification, tracking of doses, and certification** for every beneficiary.
- **Key Features:**
  - **Five Modules**:
    - Orchestration module (overall management).
    - Vaccination cold-chain module (vaccine logistics).
    - Citizen registration module (self and bulk registration).
    - Vaccinator module (session management).
    - Certificate, feedback & adverse-event reporting module.
  - **Integration:** Accessible through CoWIN website, Aarogya Setu app, UMANG app, and DigiLocker.
  - **Authentication Methods:** OTP, biometric, and demographic authentication.
  - **Real-Time Tracking:** Monitors beneficiaries, vaccine doses, wastage, and coverage at national, state, district, and sub-district levels.
- **Significance:**
  - Enabled **over 2 billion vaccine doses** to be administered and certified digitally.
  - Became a **global model of digital public good**, offered to other countries in 2021.
  - Certificates served as **key documents** for travel, employment, and access to services during the pandemic.

MPOX (MONKEYPOX)

Context:

The World Health Organization (WHO) has declared that mpox (monkeypox) is no longer a Public Health Emergency of International Concern (PHEIC) due to sustained decline in global cases and deaths.

About Mpox (monkeypox):

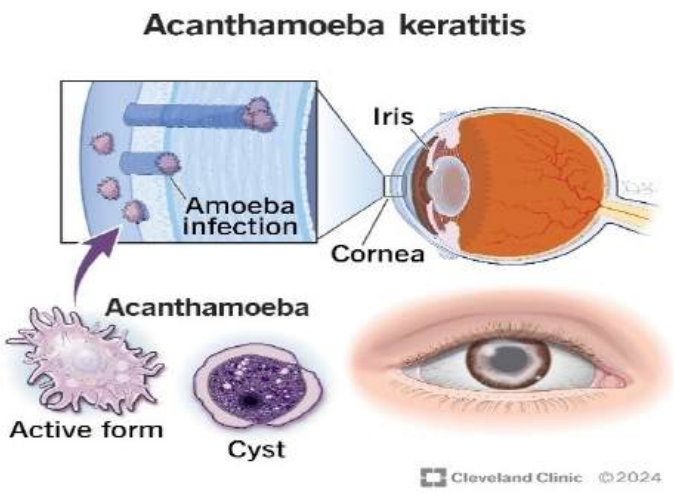
- **What it is?**
  - **Mpox (Monkeypox)** is a **viral zoonotic disease** caused by the **monkeypox virus (MPXV)**.
  - Belongs to the **Orthopoxvirus genus** of the **Poxviridae family**, which also includes variola (smallpox), cowpox, and vaccinia viruses.
- **Origin:**
  - First identified in **1958** in monkeys in Denmark.
  - First human case recorded in **1970 in the Democratic Republic of Congo (DRC)**.
  - Natural reservoir: Still unknown, though **small mammals** (squirrels, rodents, monkeys) are considered susceptible.
- **Vector / Reservoir:**
  - Likely spread from **infected animals** (rodents, primates) to humans through **bites, scratches, hunting, or consumption**.
  - Maintained in **endemic regions of Central and West Africa**, with periodic outbreaks elsewhere.
- **Symptoms:**
  - **Incubation:** 5–21 days.
  - **Early symptoms:** Fever, headache, muscle/back pain, swollen lymph nodes, low energy.
  - **Rash:** Starts on face/genitals → spreads to body (palms & soles too). Lesions evolve from flat sores → blisters → scabs.
  - Can cause severe illness in **children, pregnant women, immunocompromised (esp. HIV patients)**.

- **Transmission:**
  - **Human-to-Human:**
    - Close contact (skin-to-skin, sexual contact, respiratory droplets).
    - Sharing of **contaminated objects** (clothing, bedding, needles).
    - **Mother-to-child** transmission during pregnancy or birth.
  - **Animal-to-Human:**
    - From infected rodents/primates via bites, scratches, hunting, or meat consumption.
- **Treatment & Management:**
  - No specific proven antiviral treatment yet and supportive care is primary.
  - Care includes hydration, nutrition, pain relief, skin care, prevention of secondary infections.

ACANTHAMOEBA

Context:

Kerala's Health Department has raised concern after fresh evidence showed Acanthamoeba is more widespread in the State's waterbodies than earlier believed.



About *Acanthamoeba*:

- **What it is?**
  - A **free-living protozoan parasite**, found in soil and water.
  - Causes serious infections like **Acanthamoeba keratitis** (eye) and **Granulomatous Amoebic Encephalitis (GAE)** (brain).
- **Found in:**
  - Household wells, ponds, storage tanks, and other freshwater sources.
  - Thrives in water rich in **E. coli and high coliform count**.
- **Features:**
  - Exists in two forms: **trophozoite (active)** and **cyst (dormant, resistant)**.
  - Opportunistic pathogen, affecting both healthy and immunocompromised individuals.
  - Can enter through **minor corneal tears, contact lenses, or open wounds**.
- **Symptoms:**
  - **Keratitis:** Severe eye pain, redness, blurred vision, sensitivity to light, corneal ulcers.
  - **Encephalitis:** Headache, fever, seizures, neurological deficits — often fatal if untreated.
- **Treatment:**
  - **Keratitis:** Early diagnosis critical; treated with **antimicrobial eye drops** (biguanides, diamidines) and sometimes corneal transplant in advanced cases.
  - **Encephalitis:** Difficult to treat; combination of antifungals, antibiotics, and supportive care; survival rate remains low.
  - **Preventive Measures:** Chlorination of wells and safe water practices; strict contact lens hygiene.

CEREBO – INDIGENOUS BRAIN TOOL

Context:

CEREBO, an indigenous hand-held diagnostic device developed by ICMR with AIIMS Bhopal, NIMHANS Bengaluru, and Bioscan Research, has been launched to detect traumatic brain injuries (TBIs) within a minute.

About CEREBO – Indigenous Brain Tool

What it is?

- A **hand-held, portable, non-invasive diagnostic device** for brain injuries.
- Uses **near-infrared spectroscopy + machine learning** to detect brain abnormalities within a minute.

Developed by:

- Collaboration between **ICMR**, **Medical Device & Diagnostics Mission Secretariat (MDMS)**, **AIIMS Bhopal**, **NIMHANS Bengaluru**, and **Bioscan Research**.

Aim:

- To provide a **low-cost, rapid, radiation-free diagnostic tool** for **Traumatic Brain Injuries** **(TBIs)**, especially where CT/MRI access is limited.

Features:

- Detects **intracranial bleeding and brain edema** in under a minute.
- **Safe for infants and pregnant women**.
- Can be used by **paramedics and unskilled staff** in ambulances, rural clinics, trauma centres, and disaster zones.
- **Colour-coded results**, easy to interpret.
- Validated through **multi-centre clinical trials**; approved for emergency and military use.

Importance:

- Bridges the **diagnostic gap in rural & underserved areas**.
- Enables **early detection and triage**, reducing fatality and long-term complications.
- Reduces **dependence on costly, infrastructure-heavy imaging (CT/MRI)**.
- Potential for **global adoption** in trauma and emergency medicine.

About Traumatic Brain Injury *(TBI)*:

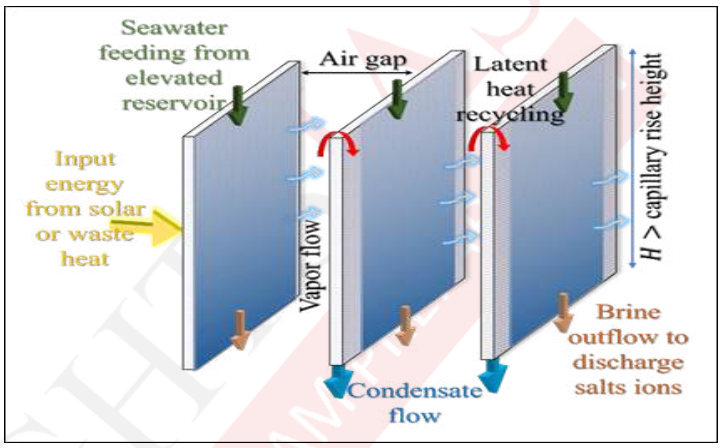
- **What it is?**
  - A **disruption of normal brain function** caused by sudden trauma to the head.
  - Can range from **mild (concussion)** to **severe**, often leading to lasting disabilities.
- **Causes:** Road accidents (≈60%), Falls (20–25%), and Violence (≈10%).
- **Features / Consequences:**
  - **Immediate**: Loss of consciousness, confusion, headache, dizziness, seizures.
  - **Complications**: Intracranial bleeding, swelling (edema), coma.
  - **Long-term**: Memory loss, cognitive decline, depression, anxiety, behavioural issues, risk of neurodegenerative diseases.
  - **Hidden risk**: Mild TBIs may go undiagnosed initially but worsen over time if untreated.

Emerging Technologies

SIPHON-POWERED DESALINATION

Context:

Indian Institute of Science (IISc) researchers have developed a siphon-powered desalination system that converts seawater into clean drinking water faster and cheaper.



About Siphon-Powered Desalination:

What it is?

- A **thermal desalination system** that uses the **principle of siphonage** to continuously draw, evaporate, and condense seawater into potable water.

Developed by: Indian Institute of Science (IISc), Bengaluru

How it works?

- **Composite siphon:** Fabric wick + grooved metal surface draws seawater.
- **Gravity flow:** Flushes away salt before crystallization.
- **Thin film evaporation:** Water spreads on heated metal, evaporates.
- **Ultra-narrow air gap:** Just **2 mm** away, vapor condenses on cooler surface.
- **Multistage stacking:** Recycles heat through multiple evaporator–condenser pairs for higher efficiency.

Key Features:

- **Efficiency:** Produces **>6 liters of potable water/m²/ hour** under sunlight (several times higher than solar stills).
- **Materials:** Low-cost — aluminum and fabric.
- **Energy use:** Runs on solar or waste heat; fully off-grid compatible.
- **Durability:** Handles **extremely salty water (up to 20% salt)** without clogging.
- **Scalable & Sustainable:** Suitable for villages, disaster zones, island nations, and coastal areas.

Significance:

- **Water Security:** Helps address drinking water scarcity in water-stressed and off-grid regions.

- **Innovation Leap:** Overcomes long-standing issues of salt buildup and scaling limits in solar desalination.
- **Sustainable Development:** Low-cost, eco-friendly solution aligned with SDG-6 (Clean Water and Sanitation).

BSNL'S SWADESHI 4G NETWORK STACK

Context:

Prime Minister of India launched BSNL's fully indigenous 4G network stack and commissioned ~98,000 mobile towers.

- This makes India the fifth country globally to build and deploy its own telecom stack, reinforcing the Aatmanirbhar Bharat vision.

About BSNL's Swadeshi 4G Network Stack:

What it is?

- India's first fully indigenous 4G telecom stack, developed under the Aatmanirbhar Bharat mission.
- Provides end-to-end cloud-native, 5G-ready architecture for mobile communications.

Organisations Involved:

- **Core Network** – Centre for Development of Telematics (C-DOT).
- **Radio Access Network (RAN)** – Tejas Networks.
- Integration & Deployment – Tata Consultancy Services (TCS).
- Implemented by **BSNL** with government support.

Aim:

- To achieve strategic autonomy and digital sovereignty in telecom infrastructure.
- To expand universal digital connectivity, covering remote, border, and tribal areas.
- To reduce dependency on foreign vendors and promote domestic manufacturing.

How it works?

- **Cloud-native architecture** allows seamless upgrades.
- End-to-end Indian stack ensures **secure communication** and better resilience.
- 4G towers deployed by BSNL are **directly upgradable to 5G** without large-scale hardware replacement.

Features:

- **Fully indigenous stack:** hardware + software made in India.
- **Scalability:** cloud-native design ensures rapid expansion and upgrades.
- **Future-ready:** architecture is **5G-capable** and lays foundation for **6G adoption**.
- **Applications supported:** digital payments, telemedicine, e-governance, online education, precision farming.

Significance:

- **Strategic Autonomy:** Reduces foreign dependence; enhances national security in critical telecom.
- **Employment & Supply Chains:** Creates jobs, strengthens local manufacturing, nurtures Indian R&D.
- **Digital Inclusion:** Connects 29,000–30,000 remote villages under Digital Bharat Nidhi.

SUPERCOMPUTERS VS NORMAL COMPUTERS

Context:

Germany's JUPITER became Europe's first exascale supercomputer, reaffirming the global race towards faster, more energy-efficient computing.

- This brings attention to India's National Supercomputing Mission and its growing PARAM and AIRAWAT series supercomputers.

About Supercomputers vs Normal Computers:

What They Are?

- **Normal Computers:** Designed for everyday tasks like browsing, office work, media consumption, gaming.
- **Supercomputers:** High-performance computing systems built to solve extremely complex, data-heavy problems (weather modelling, nuclear simulations, AI training).

Difference:

Aspect	Normal Computers	Supercomputers
Processing Power	Billions of operations/ sec (GFLOPS)	Quintillions/sec (ExaFLOPS); solve years-long tasks in hours
Architecture	1–16 CPU cores	Thousands–millions of CPUs & GPUs in parallel
Memory & Storage	GB–TB storage	Petabyte-scale storage with parallel file systems
Networking	Standard Ethernet/ Wi-Fi	Ultra-fast interconnects (InfiniBand, Omni-Path)
Cooling & Power	Small fans, low power	Liquid/immersion cooling, power use = small town
Use & Access	Direct individual use	Remote access via job schedulers for research

INDIA-AI IMPACT SUMMIT 2026

Context:
The Ministry of Electronics & IT (MeitY) has unveiled the logo and flagship initiatives for the India-AI Impact Summit 2026, scheduled for February 19–20, 2026 at Bharat Mandapam, New Delhi.

About India-AI Impact Summit 2026:

What It Is?

- A **global platform** to showcase AI's transformative role in **inclusive growth, sustainability, and social good**.
- First such summit hosted by a **Global South nation**, positioning India as a thought leader in responsible AI adoption.

Organised by: Ministry of Electronics & Information Technology (MeitY), Government of India.

Aim:

- Build a shared global vision for AI that is ethical, inclusive, and equitable.
- Democratise access to data, compute, models, and foster safe, trusted AI ecosystems.
- Promote AI for economic development, governance, health, education, and climate resilience.

Key Features:

- **Guiding Principles (Three Sutras):**
  1. **People:** AI for human dignity, cultural inclusion, and equitable opportunities.
  2. **Planet:** Resource-efficient AI for sustainability, climate resilience, and environmental protection.
  3. **Progress:** Democratised AI resources and equitable distribution of benefits.
- **Seven Thematic Chakras:** Human Capital, Inclusion, Safe & Trusted AI, Resilience, Science, Democratizing AI Resources, and AI for Social Good.
- **Flagship Initiatives:**
  1. **UDAAN Global AI Pitch Fest** – showcase startups from India & abroad.
  2. **YuvaAI Innovation Challenge** & **AI by HER** – youth & women-led innovation.
  3. **Global Innovation Challenge for All** – solve public-interest problems via AI.
  4. **AI Expo** – 300+ exhibitors, 30+ countries, 10+ thematic pavilions.
  5. **Research Symposium** – cutting-edge AI research, collaborations.
- **Launch of 8 Indigenous Foundational AI Models:** Covering healthcare, agriculture, governance, industry, multilingual AI, and material science research.
- **570 Data & AI Labs Network:** 30 labs launched as first wave, providing training on data annotation, curation, and FutureSkills programs.
- **IndiaAI Fellowship Programme:** Expanded to **13,500 scholars** (UG, PG, PhD), creating a robust AI talent pipeline across disciplines.

META DISPLAY SMART GLASSES

Context:
Meta launched the first Ray-Ban smart glasses with in-built AR display, showcased at the Meta Connect event 2025.

About Meta Display Smart Glasses:

What It Is?

- **Wearable Augmented Reality (AR) device** built into eyeglasses.
- Projects **digital content (text, images, video)** onto the lens, overlaying virtual information onto real-world view.
- Meta's Ray-Ban Display is the **first mainstream AR glasses with a built-in display** since Google Glass.

How It Works?

- **Micro-Display System:** Projects a small, bright image onto the inside of the right lens, appearing below eye-line.
- **Sensors & Cameras:** Capture surroundings, enabling environment-aware overlays.
- **Processors:** Render AR content in real time.
- **Connectivity:** Bluetooth links to smartphone for data, calls, messaging.
- **Controls:** Touch panel on arms, voice commands, and neural wristband (detects finger gestures).

Key Features:

- **Heads-Up Display (HUD):** Floating text/images for calls, directions, translations.
- **AI Integration:** Meta AI chatbot answers questions with text + images.
- **Live Interaction:** Captions/translation of conversations, video calls, navigation guidance.
- **Media Capture:** Photo/video viewfinder with sharing to WhatsApp, Instagram, Messenger.
- **Battery Life:** ~6 hours active use, 30 hours with charging case.
- **Privacy:** LED indicator when camera is active.

Applications:

- **Navigation & Travel:** Turn-by-turn walking directions, landmark info.
- **Communication:** Live captions, translations, hands-free video calls.
- **Education & Training:** AR overlays for real-time guidance, immersive learning.
- **Enterprise Use:** Field service assistance, remote collaboration.
- **Fitness & Sports:** Real-time pace, heart rate, data logging with Garmin integration.
- **Entertainment:** AR gaming, watching content on virtual screens.

Limitations:

- **Battery Constraint:** Limited to ~6 hours; needs frequent charging for heavy use.
- **Privacy Concerns:** Camera use in public raises surveillance issues.
- **Connectivity Dependence:** Requires constant smartphone + internet link.
- **Distraction Risk:** Potential for cognitive overload or unsafe use while driving.

NITI AAYOG'S 'AI FOR VIKSIT BHARAT ROADMAP'

Context:

NITI Aayog launched the 'AI for Viksit Bharat Roadmap' and 'Frontier Tech Repository' under its Frontier Tech Hub.

About NITI Aayog's AI for Viksit Bharat Roadmap:

What it is?

A **comprehensive national blueprint** to harness Artificial Intelligence (AI) as a growth accelerator.

- **Focus:** Productivity enhancement, sector-specific AI adoption, innovation-driven R&D.
- **Objective:** Bridge 30–35% of India's growth gap to achieve sustained **8%+ GDP growth** by 2035.
- **Approach:**
  1. Accelerate AI adoption in key industries (banking, manufacturing, pharma, auto).
  2. Transform R&D with generative AI to leapfrog innovation.
  3. Strengthen data, compute, talent, and governance infrastructure for inclusive growth.

Key Summary of Report:

1. **AI's Economic Potential:** Can add **$500–600B** to GDP by 2035 through productivity gains and efficiency
2. **Sectoral Priority:** Banking & manufacturing could derive **20–25% of sectoral GDP** from AI; pharma & auto identified for leapfrog innovation
3. **Data Capital of the World:** India to become global hub of **trusted, anonymized data ecosystems** through AI Kosh, sectoral data grids, and DPI integration
4. **AI Skilling Ecosystem:** Plans for **AI Open University**, AI Chairs in top institutes, national certification programs, and workforce reskilling to close skill gaps
5. **Generative AI in R&D:** Can cut drug discovery timelines by **60–80%**, speed automotive design validation, and reduce costs of innovation
6. **Frontier Tech Repository:** 200+ case studies in **agriculture, healthcare, education, and national security** to inspire states & districts
7. **Frontier 50 Initiative:** Support for **50** aspirational districts to implement frontier tech solutions for service saturation
8. **Impact Awards:** Recognition for top 3 states leveraging technology for governance, education, health & livelihood transformation

India's Opportunity:

- **Demographic Dividend:** Large STEM workforce to lead global AI innovation and service exports.
- **Digital Public Infrastructure (DPI):** UPI, Aadhaar, ABHA, and Account Aggregator create scalable AI use cases.
- **Global AI Hub Potential:** AI Kosh + 38,000+ GPU compute network can attract global R&D investments.
- **Export Competitiveness:** AI-enabled manufacturing, pharma, and auto components can boost India's share in global value chains.
- **Inclusive Growth:** AI adoption in agriculture, health, education can improve service delivery in rural and underserved regions.

Challenges:

- **Talent Gaps:** Limited high-end AI researchers and applied AI professionals.
- **Fragmented Data Ecosystem:** Need for standardised, privacy-compliant, sectoral data-sharing frameworks.
- **Compute Infrastructure:** GPU shortages, lack of edge-cloud networks could slow deployment.
- **Regulatory Uncertainty:** Patent norms for AI-discovered drugs, cybersecurity compliance for AI models need clarity.
- **Adoption Divide:** MSMEs and small financial institutions may struggle to afford AI solutions, widening inequality in adoption.

Way Ahead:

- **National AI Mission Execution:** Fast-track implementation of IndiaAI Mission with periodic monitoring.
- **AI-Ready Infrastructure:** Invest in **AI-ready industrial parks**, federated compute networks, and data exchanges.
- **Skilling at Scale:** Launch AI micro-credentials, lifelong learning pathways, and reverse diaspora programs for top talent.
- **Robust AI Governance:** Build frameworks for **ethical AI**, explainability, risk audits, and consumer protection.
- **Public-Private Partnerships:** Incentivise startups, industry, and academia to co-develop solutions and scale innovation.

Conclusion:

The **AI for Viksit Bharat Roadmap** is a bold step to make India a **global AI powerhouse**. If executed well, it can close the growth gap, generate millions of new-age jobs, and place India at the forefront of **responsible, inclusive, innovation-driven growth**. Timely execution, governance, and skilling will decide whether India leads or lags in the global AI revolution.

LIGHT-BASED COMPUTERS (OPTICAL COMPUTERS)

Context:

Researchers from Tampere University (Finland) and Université Marie et Louis Pasteur (France) found that intense light pulses in optical fibres can perform AI tasks faster and with lower energy use than conventional computers.

About Light-based computers (Optical computers):

- **What It Is?**
  - **Light-based computers**, or **optical computers**, use **photons (light particles)** instead of **electrons** to process information.
  - They promise ultra-fast, energy-efficient, and high-bandwidth computing – ideal for

AI and big data tasks.

- **Discovered by:** Recent breakthrough credited to **Tampere University** and **Université Marie et Louis Pasteur** teams who demonstrated **AI image recognition** using light through glass fibres.
- **How It Works:**
  - **Step 1:** Convert data (like an image) into a light pulse.
  - **Step 2:** Send this pulse through an **optical fibre**, where light behaves in a unique way (non-linear response).
  - **Step 3:** The light's changes (colour spectrum or "fingerprint") carry the transformed data.
  - **Step 4:** This transformed light data is decoded to produce the result — e.g., identify a number in an image.
- **Key Characteristics:**
  - **Speed:** Light travels faster than electricity — enabling near-instant calculations.
  - **Efficiency:** Generates less heat, saving power compared to silicon chips.
  - **Parallel Processing:** Can handle multiple data streams at once (different light colours = different signals).
  - **Accuracy:** Achieved over **91–93% image recognition success** in experiments.
  - **Scalability:** Works best when fibre length and light strength are optimised.
- **Applications:**
  - **AI & Machine Learning:** Faster training of neural networks, real-time image recognition.
  - **Supercomputing:** Energy-efficient data centres for climate modelling, genomics, weather forecasts.
  - **Telecom & Internet:** Boosts fibre-optic data processing, reducing latency.
  - **Defence & Space:** High-speed data analysis for surveillance, satellite imaging.

TWO-FACTOR AUTHENTICATION (2FA)

Context:

The rising vulnerability of passwords has led to the adoption of Two-Factor Authentication (2FA) worldwide. Popular apps like Google Authenticator now use TOTP-based codes that refresh every 30 seconds to enhance digital security.

About Two-Factor Authentication (2FA):

- **What it is?**
  - A security mechanism that requires users to verify identity using **two different factors** — something they know (password) and something they have (phone/authenticator app).
- **Developed by:**
  - Concept of **multi-factor authentication** emerged in the 1980s in computer science security research.
  - **TOTP standard** (Time-based One-Time Password) was developed by **IETF (Internet Engineering Task Force)** in 2011 for global interoperability.
- **Objective:** To strengthen authentication, prevent account breaches, and ensure data security by adding a second verification layer beyond traditional passwords.
- **How it works:**
  - **Step 1:** User enters **password** (first factor).
  - **Step 2:** An **authenticator app or hardware token** generates a time-based OTP (second factor).
  - The server and app share a **secret key**, using cryptographic HMAC functions with time counters to generate identical codes.
  - If both match, access is granted.
- **Features:**
  - Uses **TOTP (Time-based One-Time Passwords)** valid for ~30 seconds.
  - Employs **hash functions & HMAC-SHA256** for strong encryption.
  - Works offline via authenticator apps (Google Authenticator, Authy, Microsoft Authenticator).
  - Can also be implemented via **hardware tokens** (YubiKey), SMS, or push notifications.
  - Layered approach makes brute force or code interception nearly impossible.
- **Significance:**
  - Shields accounts from password theft,

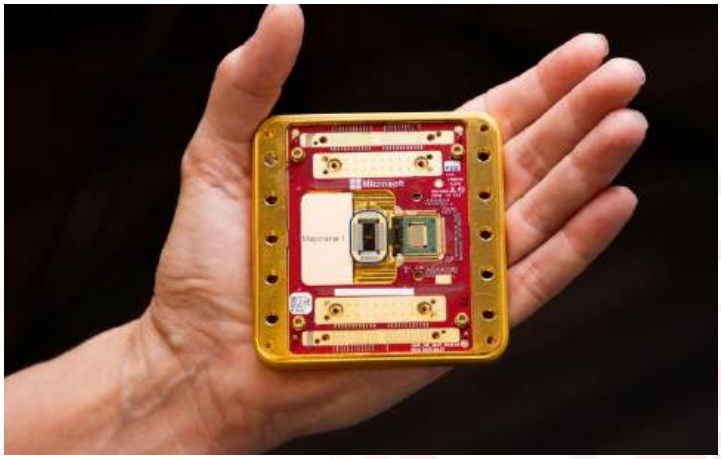
phishing, and brute-force attacks.
- Widely used in **banking, government portals, healthcare, and corporate IT systems**.
- Promotes digital trust, crucial for **Digital India, Aadhaar-based services, and cyber governance**.

MAJORANA PARTICLES

Context:

Scientists are exploring Majorana particles as building blocks for stable quantum computers, since their unique properties could solve the persistent problem of qubit decoherence.

- Recent condensed-matter experiments in superconducting nanowires have shown signals consistent with Majorana modes.



About *Majorana Particles*:

What it is?

- A **hypothetical particle** that is its own antiparticle.
- Unlike electrons or protons, which annihilate with their antimatter counterparts, Majoranas are perfectly symmetric.

Discovered by:

- Proposed in **1937 by Italian physicist Ettore Majorana**.
- First suggested in theoretical particle physics; later explored in condensed matter systems as **quasiparticles**.

Characteristics:

- **Self-mirror nature**: A Majorana particle is its **own antiparticle**. Unlike an electron (matter) and positron (antimatter), there's no distinction.
- **No annihilation with itself**: If two Majoranas meet, they don't destroy each other, unlike normal matter-antimatter pairs.
- **Neutral in charge**: They don't carry electric charge, which makes them harder to detect directly.
- **Appear in special materials**: In labs, they show up as **quasiparticles** inside superconductors at extremely low temperatures, not as free particles in nature.
- **Come in pairs**: They usually exist in two separate halves. Together they form one quantum state, but each half is stored far apart, giving them natural **error resistance**.
- **Exotic quantum behavior**: They belong to a rare category called **non-Abelian anyons**. When you swap or "braid" them, the overall quantum state changes in a unique, predictable way.
- **Hard to pin down**: Signals that suggest their presence can often be mimicked by other effects, so scientists are cautious in confirming them.

Applications:

- **Quantum Computing**: foundation of **topological qubits**, naturally robust against decoherence and noise.
- **Particle Physics**: search for fundamental Majorana fermions (e.g., whether neutrinos are Majorana particles).
- **Condensed Matter Physics**: advances in superconductors, nanowires, and quantum materials.

VIKRAM 32-BIT PROCESSOR

Context:

Prime Minister of India unveiled India's first indigenously developed semiconductor — the 'Vikram 32-bit processor' at Semicon India 2025, marking a milestone in India's journey towards semiconductor self-reliance.

About Vikram 32-bit Processor:

- **What it is?**
  - A **32-bit indigenously designed semiconductor chip**, officially named **VIKRAM3201**.
  - Built as India's first **made-in-India processor**, suitable for use in **space, defence, and advanced technologies**.
- **Developed by:**
  - **ISRO's Semiconductor Laboratory (SCL), Mohali, Punjab**, under the **India**

Semiconductor Mission launched in 2021.

- **Aim:**
  - To reduce India's dependence on imported chips.
  - To build **strategic self-reliance** in critical technologies.
  - To power applications in **aerospace, defence, automotive, and high-reliability energy systems**.
- **Features:**
  - **32-bit architecture**, robust enough for advanced applications.
  - Designed to **withstand harsh environmental conditions** such as those in **space launch vehicles**.
  - Suitable for **defence, aerospace, automotive, and industrial electronics**.
  - Supports **next-gen technologies** like mRNA medicines, immersive tech, and digital security systems (as per ISRO & Semicon Mission's broader design focus).
- **Significance:**
  - **Strategic:** Boosts India's **technological sovereignty**, crucial amid global chip supply chain vulnerabilities.
  - **Economic:** Supports India's ambition of becoming a **semiconductor hub**, with projects worth **₹1.6 lakh crore approved across states**.

Space

ASTROSAT – INDIA'S FIRST SPACE OBSERVATORY

Context:

AstroSat, India's first multi-wavelength space observatory, has completed 10 years in orbit since its launch on 28 September 2015 by PSLV-C30.

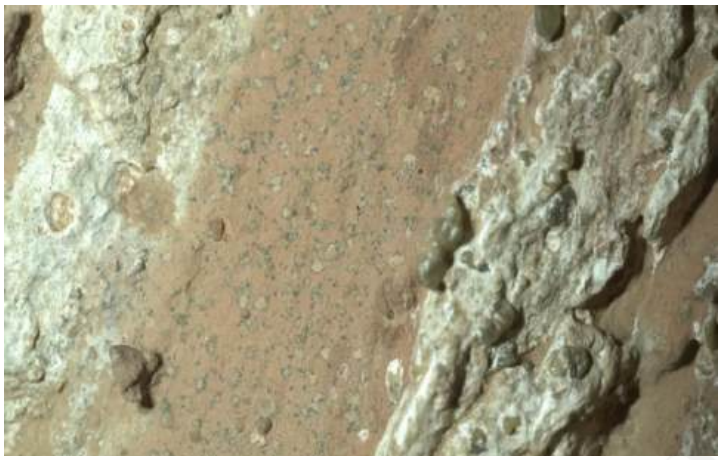
About AstroSat – India's First Space Observatory:

- **What it is?**
  - India's **first dedicated multi-wavelength space astronomy observatory**, capable of observing the universe in **UV, visible, soft X-ray, and hard X-ray bands simultaneously**.
  - A collaborative project of **ISRO and premier Indian research institutes** with international partners (Canada, UK).
- **Launched in:**
  - **Date:** 28 September 2015.
  - **Launch Vehicle:** PSLV-C30 (XL configuration).
  - **Launch Site:** Satish Dhawan Space Centre, Sriharikota.
- **Aim:**
  - To enable simultaneous multi-band observations of celestial phenomena.
  - To provide Indian astronomers with space-based capabilities, reducing dependence on foreign observatories.
  - To contribute to global astronomy research through open access to scientists worldwide.
- **Features:**
  - **Payloads (5):**
    - Ultra Violet Imaging Telescope (UVIT)
    - Large Area X-ray Proportional Counter (LAXPC)
    - Cadmium–Zinc–Telluride Imager (CZTI)
    - Soft X-ray Telescope (SXT)
    - Scanning Sky Monitor (SSM)
  - **Discoveries & Contributions:**
    - Solved a puzzle about a red giant star's unusual brightness.
    - Detected **far-UV photons from galaxies ~9 billion light years away**.
    - Showed extended emission of the **Butterfly Nebula**.
    - Discovered **fast-spinning black holes** and studied **X-ray binaries**.
    - Conducted **X-ray polarization studies** and captured galaxy mergers.
- **Significance:**
  - **Scientific Breakthroughs:** Provided India with a world-class astronomy platform, contributing to black hole, neutron star, and galaxy studies.
  - **Capacity Building:** Nurtured new generation of Indian astronomers, with half the users being students/researchers from India.

NASA DISCOVERS POTENTIAL BIOSIGNATURES ON MARS: SAPPHIRE CANYON & CHEYAVA FALLS

Context:

NASA's Perseverance rover has detected the strongest potential biosignatures yet on Mars, in a rock sample nicknamed Cheyava Falls from the Sapphire Canyon region.



About Sapphire Canyon:

- **What it is?**
  - A **rocky outcrop** on the edges of **Neretva Vallis River valley**, near Jezero Crater on Mars.
  - Named "Sapphire Canyon" by Perseverance science team; contains the **Cheyava Falls** rock.
- **Found In:**
  - Discovered and drilled by **NASA's Perseverance rover** in **July 2024**.
  - Sample stored in sealed tube for eventual return to Earth.

About Cheyava Falls Rock Characteristics:

- Contains **clay, silt, organic carbon, sulphur, iron oxides, and phosphate** – ideal for preserving ancient microbial life.
- Shows unique **black mottling ('poppy seeds') and leopard-spot textures**, possible result of water-rock chemical reactions.
- White calcium sulfate veins indicate **past water flow**.
- SHERLOC & PIXL instruments detected **organic matter and phosphate**, key building blocks of life.

About Biosignatures:

- **What it is?**
  - A **biosignature** is any object, chemical, or structure that may have **biological origin** — formed or influenced by living organisms.
- **Discovery on Mars:**
  - Perseverance's SHERLOC instrument detected **organic carbon compounds** and electron-transfer reaction markers.
  - Combination of minerals and structures suggests possible **microbial metabolism** in ancient lake sediments.
- **Significance:**
  - Closest evidence yet of past life beyond Earth.
  - Strengthens case for Mars Sample Return Mission, which can confirm biological vs. abiotic origins.

ISRO SIGNED 100TH TECHNOLOGY TRANSFER WITH HAL FOR SSLV PRODUCTION

Context:

ISRO signed its 100th technology transfer agreement with Hindustan Aeronautics Limited (HAL) to enable independent production of Small Satellite Launch Vehicles (SSLVs).

About ISRO Signed 100th Technology Transfer with HAL for SSLV Production:

About *Small Satellite Launch Vehicle (SSLV)*:

- **What it is?**
  - A **3-stage, cost-effective launch vehicle** designed for deploying small satellites.
  - Configured with **three solid propulsion stages** and a **liquid-based Velocity Trimming Module (VTM)** as the terminal stage.
- **Developed by:** Indian Space Research Organisation (ISRO).
- **Objective:**
  - To meet the **growing demand in the global small satellite market**.
  - To provide **low-cost, quick turnaround, and launch-on-demand capability** with minimal infrastructure.

- **Specifications of SSLV:**
  - **Size**: About **2 meters wide** and **34 meters tall** – roughly the height of an 11-storey building.
  - **Weight**: Around **120 tonnes** at liftoff.
  - **Payload Capacity**: Can carry **up to 500 kg** of satellites into a **500 km orbit** – suitable for small satellites.
- **Engines & Propulsion:**
  - **First Stage:** Solid fuel engine.
  - **Second Stage:** Solid fuel.
  - **Third Stage:** Solid fuel.
  - **Final Adjustment (VTM):** Small liquid-fuel engines (MMH + MON-3), **16 tiny thrusters (50 N each)** for precise orbit placement.
- **What it Can Do?**
  - Launch **single or multiple satellites** at once.
  - Specially designed for **nanosatellites, microsatellites, and minisatellites** (weighing **10–500 kg**).
  - Provides **flexible, quick, and low-cost launch options** for both domestic and international customers.
- **Significance of Agreement with HAL:**
  - **Boosts Atmanirbharta** – HAL gains capability to manufacture SSLVs independently.
  - **Industrial Ecosystem** – Expands India's private sector role in space tech.
  - **Commercial Competitiveness** – Positions India in the **global small-satellite launch market**.
  - **Technology Transfer Milestone** – Marks ISRO's **100th technology transfer** achievement.

BLOOD MOON

Context:

A blood moon will be visible in India on September 7, 2025, during a total lunar eclipse, when the moon will appear dark red due to Earth's shadow.

About Blood Moon:

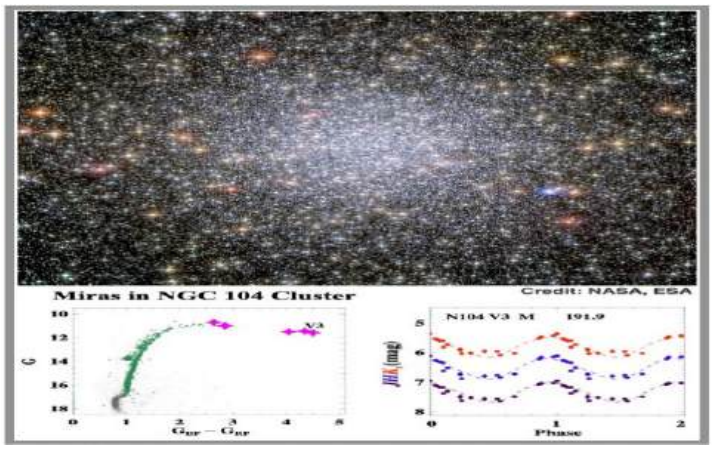
- **What it is?**
  - A *blood moon* is a total lunar eclipse when the moon takes on a **reddish-copper hue** instead of its usual white glow.
- **How it Occurs?**
  - During a **total lunar eclipse**, Earth comes between the sun and the moon.
  - Direct sunlight is blocked, but Earth's atmosphere bends and scatters some light onto the moon.
  - Blue light is filtered out, while **red light is refracted** toward the moon, giving it a reddish colour.
- **Features:**
  - Colour intensity depends on **dust, smoke, and particles** in Earth's atmosphere.
  - The reddish effect is due to **Rayleigh scattering**, the same process that makes the sky appear blue.
  - Visible across large regions where the eclipse is above the horizon.
  - Entirely natural and predictable.
  - Can last for several hours depending on eclipse duration.
- **Significance:**
  - Offers insights into **Earth's atmospheric composition** (dust, volcanic ash, pollution).
  - Important for **astronomical studies** and public science outreach.
  - A popular **cultural and spiritual symbol** across societies.

MIRA VARIABLE STARS

Context:

A new IUCAA-led study (with Nobel laureate Adam Riess as co-author) has used Mira variable stars to measure the Hubble constant with 3.7% precision.

- This provides an independent anchor for the cosmic distance ladder, potentially helping resolve the ongoing *Hubble tension*.



About Mira variable stars:

- **What it is?**
  - Mira variables are **cool, pulsating red giant stars** whose brightness varies regularly due to expansion and contraction cycles in their outer layers.
- **Discovery:**
  - The prototype star **Mira (Omicron Ceti)** was identified as variable in **1596 by David Fabricius** and further studied in the **17th century**, making it the first recognized variable star.
- **Features:**
  - Brightness variation period: **100–1,000 days**.
  - Surface temperature: **~3,000 K** (about half of Sun's surface).
  - Located in late evolutionary stage (dying giant stars).
  - Strong **period–luminosity relationship**, similar to Cepheid variables.
  - Oxygen-rich types (used in the study) are less affected by metallicity, giving **cleaner luminosity calibration**.
- **Significance:**
  - Serve as **"standard candles"** in astronomy—helping measure cosmic distances.
  - Provide a new **independent calibration** for Type Ia supernovae in the extragalactic distance ladder.
  - Crucial in determining the **Hubble constant** and addressing the **Hubble tension** (discrepancy in expansion rate of the Universe measured via early vs. late-Universe methods).

Defence and Security

THE NATIONAL SECURITY COUNCIL SECRETARIAT (NSCS)

Context:

India's **first National Security Strategy (NSS)** is in its final drafting stage and is expected to be completed by December 2025.

- The **National Security Council Secretariat (NSCS)** is finalising the document, which integrates key areas like defence, cyber, and internal security.

About The National Security Council Secretariat (NSCS):

What it is?

- **NSCS** is the secretariat of the National Security Council (NSC) — the apex advisory body on internal and external security matters.
- Functions as the core strategic planning body for India's national security.

Origin: Created in the late 1990s, post-Kargil security reviews.

Headed by: The National Security Advisor (NSA), who holds the rank of Cabinet Minister.

- NSA is the Secretary of the NSC and chief of the NSCS.

Aim:

- Provide strategy, direction, and long-term vision for India's security preparedness.
- Ensure coordinated action across ministries and agencies dealing with national security.

Members:

- **Three Deputy NSAs** – drawn from Indian Foreign Service, Indian Police Service, and Armed Forces.
- **Military Adviser** – coordinates with Ministry of Defence, oversees induction of technologies.
- **National Maritime Security Coordinator (NMSC)** – liaises with coastal states, Coast Guard, and maritime agencies.
- **Additional NSA (ANSA)** – position now activated to streamline functioning.

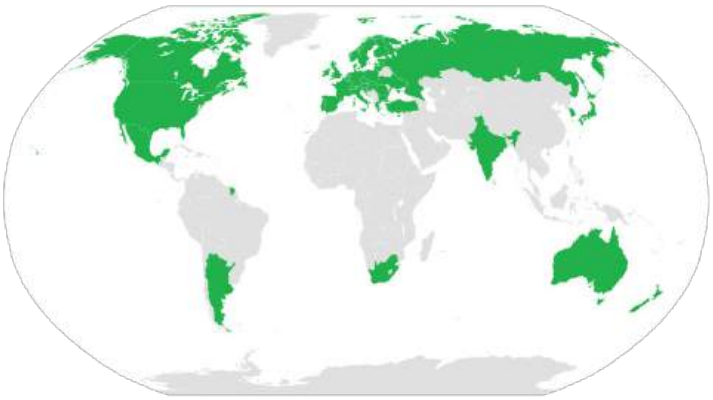
Functions and Powers:

- Drafts and reviews the **National Security Strategy** and related doctrines.
- Advises NSC on **internal security, external threats, cyber resilience, economic security, and hybrid warfare**.
- Coordinates intelligence, defence, and diplomatic inputs for integrated security planning.
- Holds powers to access **Cabinet papers**, generate **Cabinet notes**, and participate in policy-making.
- Acts as the **nerve centre** of India's strategic and security decision-making ecosystem.

THE WASSENAAR ARRANGEMENT

Context:

The Wassenaar Arrangement faces calls for reform as its export-control framework struggles to regulate cloud services, SaaS models, and digital surveillance technologies.



About The Wassenaar Arrangement:

What it is?

- A multilateral export control regime on conventional arms and dual-use goods/technologies.
- Established in **1996** at **Wassenaar, Netherlands** as a successor to CoCom (Cold War era control system).
- **Not a treaty** but its voluntary, consensus-based coordination mechanism.

Origin:

- Set up to **promote transparency and responsibility** in sensitive technology transfers.
- **Headquarters:** Vienna, Austria with a small permanent **Secretariat**.

Key Nations Involved:

- **42 participating states** including:
  - **Major powers:** US, UK, France, Germany, Russia, Japan.
  - **Emerging economies:** India, South Africa, Mexico, Republic of Korea.

Aim:

- Prevent destabilizing build-up of arms and sensitive technologies.
- Ensure items are **not diverted** to terrorists, rogue regimes, or proliferation networks.
- Balance between **security concerns** and **legitimate trade/innovation**.

Key Features:

- **Control Lists**: Dual-Use Goods & Technologies and Munitions List.
- **Information Exchange**: Members report transfers/ denials every six months.
- **Decision-making:** By **consensus**, ensuring national discretion.
- **Scope Expansion:** Since 2013, includes **intrusion software** and cyber-surveillance tools.

India and Wassenaar Arrangement:

- **Joined in 2017**, boosting its entry into **global non-proliferation regimes**.
- Incorporated control lists into **SCOMET framework** (Special Chemicals, Organisms, Materials, Equipment and Technologies).

Issue:

- The **Wassenaar Arrangement**, built in the 1990s to control physical exports of arms and dual-use goods, has not adapted to the **digital era**.
- Modern technologies like **cloud services, SaaS, AI, and cyber-surveillance tools** often bypass its framework, creating **grey areas and loopholes**.

THE ARMED FORCES (SPECIAL POWERS) ACT, 1958

Context:

The Government of India has extended the Armed Forces (Special Powers) Act, 1958 (AFSPA) in parts of Manipur, Nagaland, and Arunachal Pradesh for another six months.

About The Armed Forces (Special Powers) Act, 1958:

What it is?

- The AFSPA is a special law enacted in 1958 that grants extraordinary powers to the armed forces to maintain public order in "disturbed areas" where civil governance is unable to function effectively.

Aim: Its primary objective is to empower security forces to deal with insurgency, maintain peace, and assist the civil administration in regions experiencing violent disturbances and armed rebellion.

Procedure for Declaration:

- Under Section 3, the **Governor of a State, Administrator of a Union Territory, or the Central Government** can declare any area "disturbed" if it is deemed dangerous to public peace.
- The notification is published in the official gazette, and periodic review is mandated every six months.

Key Features:

- **Special powers to armed forces**:
  - Fire upon or use force, even to the extent of causing death, against persons violating prohibitory orders (assembly of 5 or more, carrying arms).
  - Destroy arms dumps, fortified positions, or hideouts used by insurgents.
  - Arrest without warrant on suspicion of cognizable offences.
  - Search premises without warrant and recover arms or persons wrongfully confined.
- **Custody rules:** Arrested persons must be handed over to the nearest police station at the earliest opportunity.
- **Legal immunity:** No prosecution or legal proceeding can be initiated against armed forces personnel without prior sanction of the Central Government.

Importance:

- Provides a legal framework for the armed forces to aid civil authority in counter-insurgency operations.
- Ensures swift action in maintaining sovereignty, integrity, and security in disturbed regions.

MIG-21

Context:

The Indian Air Force (IAF) formally retired its last two MiG-21 squadrons — No. 23 Panthers and No. 3 Cobras — marking the end of a six-decade era.

About MiG-21:

What it is?

- A **supersonic jet fighter and interceptor** with delta-wing design.
- NATO codename: **"Fishbed"**; nicknames include Balalaika (shape) and Silver Swallow.

Developed by:

- Designed in the **1950s** by the **Mikoyan-Gurevich Design Bureau** (Soviet Union).
- First prototype (Ye-4) flew in **1955** and became the world's **most-produced supersonic jet**.

History in India:

- Inducted in **1963** as IAF's first supersonic jet.
- India procured **700+ MiG-21s** across variants, the last being **MiG-21 Bison** (2006 upgrade).
- Saw action in **1965 War**, **1971 Bangladesh Liberation War**, and **1999 Kargil conflict**.
- Also carried controversies due to **high crash record** (500+ accidents, 170+ pilot deaths).

Features:

- **Single-engine, single-seat interceptor** and top speed Mach 2.
- **Delta wing** for rapid climb but limited turning combat.
- **Bison upgrade** added modern avionics, radar, and BVR missiles (Derby, ASTRA).
- Emergency thrust mode gave thrust-to-weight ratio near 1:1 for short bursts.

Contribution so far:

- Served as IAF's backbone for six decades; trained multiple generations of fighter pilots.
- Symbolised Soviet-Indian defence cooperation during Cold War.

INDIA TEST-FIRES AGNI-PRIME MISSILE FROM RAIL-BASED MOBILE LAUNCHER

Context:

India successfully test-fired the Agni-Prime intermediate-range missile from a rail-based mobile launcher, a first-of-its-kind launch that enhances mobility and stealth in strategic deterrence.

About India test-fires Agni-Prime missile from rail-based mobile launcher:

What it is?

- **Agni-Prime (Agni-P):** A next-generation, nuclear-capable intermediate-range ballistic missile.
- Part of India's **Agni missile series**, designed to strengthen strategic deterrence under the Strategic Forces Command (SFC).

Developed by:

Designed and developed by Defence Research and Development Organisation (DRDO) in collaboration with SFC.

Aim:

- To provide flexible, survivable, and rapid-response capability in India's nuclear doctrine.
- To diversify launch platforms beyond road-based systems, ensuring resilience against first strikes.

Key Features:

- **Range:** Up to **2,000 km** (intermediate range).
- **Rail-based mobility:** Can move freely across national rail networks, reducing predictability of launch sites.
- **Quick reaction time:** Launch possible within minutes with minimal visibility.
- **Canisterised system:** Ensures faster deployment, storage safety, and longer shelf life.
- **Advanced guidance:** State-of-the-art communication, navigation, and independent launch capability.
- **Stealth:** Reduced detectability improves survivability against pre-emptive strikes.

Significance:

- **Strategic Deterrence:** Places India among select nations with rail-based canisterised launch systems.
- **Geopolitical Edge:** Enhances India's nuclear triad survivability amid evolving regional security challenges.
- **Operational Flexibility:** Rail mobility complements road and silo systems, complicating adversary targeting.

INDIA'S FIRST OVERSEAS DEFENCE MANUFACTURING FACILITY

Context:

India's first overseas defence manufacturing facility was inaugurated at Berrechid, Morocco by Defence Minister of India and his Moroccan counterpart Abdelatif Loudyi.

- The facility, set up by **Tata Advanced Systems Limited (TASL),** will produce the indigenously developed Wheeled Armoured Platform (WhAP) for the Royal Moroccan Army.

About India's first overseas defence manufacturing facility:

What it is?

- A **20,000 sq. metre state-of-the-art defence plant** established by **TASL** in partnership with **DRDO**.
- Marks the **first overseas defence facility by an Indian private company** in Africa.

Launched in: Berrechid, Morocco (2025).

Aim:

- To promote India's vision of **Aatmanirbhar Bharat → Make with Friends → Make for the World**.
- Strengthen **India–Morocco defence partnership**, enhance exports, and support regional security.

Features:

- Production of **WhAP 8x8 Modular Combat Platform**, jointly developed by DRDO & TASL.
- **Configurations include:** Infantry Fighting Vehicle, Armoured Personnel Carrier, Reconnaissance Vehicle, Command Post, Mortar Carrier, and Ambulance.
- Equipped with **advanced mobility, protection, remote weapon stations, and anti-tank guided missile options**.
- **Local sourcing:** one-third of components from Morocco initially, rising to 50% in future.

Importance:

- **Strategic:** Positions Morocco as an export hub to Africa & Europe.
- **Diplomatic:** Deepens India–Morocco bilateral ties and showcases India's defence diplomacy.
- **Economic:** Generates local employment, creates supplier ecosystem, and boosts defence exports.

EXERCISE COLD START

Context:

India will hold a mega tri-service drone drill 'Cold Start' in Madhya Pradesh in October 2025.

- It will be the largest joint exercise on drones and counter-drone systems since *Operation Sindoor*.

About Exercise Cold Start:

- **What it is?**
  - A **tri-service military exercise** focused on testing drones and counter-drone systems.
  - Designed to simulate **aerial threats and defence responses** in modern warfare.
- **Host:** To be conducted in **Madhya Pradesh**, in the **first week of October 2025**.
- **Organisations Involved:**
  - **Indian Army, Navy, and Air Force** (joint participation).
  - Industry partners, R&D agencies, and academic institutions as knowledge collaborators.
- **Aim:**
  - To evaluate operational readiness against drones, UAVs, and aerial threats.
  - To identify gaps and enhance air defence capabilities.
  - To stay ahead of adversaries like Pakistan in counter-drone and jamming technologies.
- **Features:**
  - **Live drills** with drones and counter-drone systems.
  - Integration of **GPS jamming, electronic warfare, and surveillance systems**.
  - Concept inspired by **Sudarshan Chakra** for integrated defence against drones, UAVs, hypersonic missiles, and other threats.
  - Testing of **indigenous technologies** developed with industry and academia.
- **Significance:**
  - Strengthens **jointness among armed forces** in counter-drone warfare.
  - Demonstrates India's preparedness for **future technology-driven conflicts**.
  - Provides a **platform for military–industry–academia synergy** in defence R&D.

COMBINED OPERATIONAL REVIEW AND EVALUATION (CORE) PROGRAMME

Context:

Headquarters Integrated Defence Staff (HQ IDS) launched the Combined Operational Review and Evaluation (CORE) Programme in New Delhi.

About Combined Operational Review and Evaluation (CORE) Programme:

What it is?

- A five-day professional engagement programme on **national and regional security issues**.
- Acts as a forum for **civil–military dialogue**, strategic review, and leadership development.

Organisation Involved:

- HQ Integrated Defence Staff (IDS) as the nodal organiser.
- Participants include senior officers from Armed Forces, and ministries of Defence, External Affairs, and Home Affairs.

Aim:

- To strengthen civil–military synergy in addressing multidimensional threats.
- To enhance strategic awareness and foster balanced decision-making among future leaders.

Features:

- **Themes** – regional/global security, tech transformation of warfare, strategic communication, inter-agency synergy.
- **Method** – lectures, discussions, and interactions with subject-matter experts and professionals.
- **Focus** – joint problem-solving, leadership exposure, cross-domain learning.
- **Participants** – senior civil and military officers for holistic security perspectives.

Significance:

- Builds **intellectual foundations** for senior leadership.
- Encourages **jointness in Armed Forces** and coordination with civilian agencies.
- Enhances preparedness for **complex, multidimensional threats** at national and international levels.

ANDROTH ANTI-SUBMARINE WARFARE SHIP

Context:

The Indian Navy has inducted 'Androth', the second Anti-Submarine Warfare Shallow Water Craft (ASW-SWC), built by Garden Reach Shipbuilders & Engineers (GRSE), Kolkata.

About Androth Anti-Submarine Warfare Ship:

What It Is?

- **Indigenously built Anti-Submarine Warfare Shallow Water Craft (ASW-SWC)**.
- Part of **8-ship series** being inducted into the Indian Navy.

Positioned In:

- Intended for **coastal security, anti-submarine patrols, and shallow-water operations** in India's maritime zones, especially around the **Lakshadweep archipelago** and other critical sea lanes.

Developed By:

- Garden Reach Shipbuilders & Engineers (GRSE), Kolkata – one of India's premier defence shipyards.

Aim:

- Enhance **anti-submarine warfare capability** against underwater threats.
- Strengthen **coastal surveillance** and safeguard **maritime borders**.
- Contribute to **'Aatmanirbhar Bharat'** by promoting indigenous defence production.

Key Features:

- **Length:** ~77 metres, among the largest Indian naval warships with diesel engine–waterjet propulsion.
- **Weapon Systems:**
  - Indigenous **lightweight torpedoes**
  - **Anti-submarine warfare rockets**
- **Indigenous Content:** Over **80% made in India** – reducing import dependence.
- **Maneuverability:** Ideal for operations in **littoral waters**, shallow coastal regions.
- **Surveillance:** Equipped with **state-of-the-art sonar and sensors** for detecting submarines.

MAJOR U.S.-LED MILITARY EXERCISES AROUND INDIA

Context:

Bangladesh and the United States will conduct three joint exercises (Tiger Lightning, Tiger Shark, Pacific Angel) and launch the RQ-21 UAS program in 2025 to enhance interoperability and regional security.

About *Major U.S.-Led Military Exercises Around India*:

Exercise Tiger Lightning 2025:

- **Host:** Bangladesh
- **Participants:** Bangladesh Army and U.S. Army Pacific
- **Aim:** Improve readiness for counter-terrorism, peacekeeping operations, jungle warfare, and medical evacuation.
- **Key Features:**
  - Focus on counter-K training and rescue drills.
  - Practical simulation-based exercises to boost soldier preparedness.

Exercise Tiger Shark 2025 (Flash Bengal Series):

- **Host:** Bangladesh
- **Participants:** Bangladesh Special Warfare Diving and Salvage Unit, Para Commando Brigade, U.S. Special Forces
- **Aim:** Strengthen maritime security operations and special operations readiness.

- **Key Features:**
  - Training in patrol boat handling and small-arms marksmanship.
  - Use of U.S. equipment to improve interoperability in crisis response.

Exercise Pacific Angel 2025:

- **Host:** Bangladesh (4th iteration) and Sri Lanka (largest regional event in 2025)
- **Participants:** U.S. Pacific Air Forces, Bangladesh Air Force, Sri Lanka Air Force, Royal Australian Air Force, Japan Air Self-Defense Force, Maldives Defence Force
- **Aim:** Enhance disaster response, humanitarian assistance, and aeromedical evacuation capability.
- **Key Features:**
  - C-130 aircraft airdrop training and air mobility drills.
  - Search & Rescue (SAR), jungle survival, and mass casualty response exercises.
  - Strengthens multi-nation interoperability for regional HADR.

RQ-21 Blackjack UAS Program Launch:

- **Location:** Bangladesh
- **Partners:** U.S. Army & Navy with Bangladesh Army/ Navy
- **Aim:** Build indigenous unmanned aerial surveillance capability.
- **Key Features:**
  - Joint Army-Navy regiment created to operate UAS.
  - Supports maritime domain awareness, border security, and UN peacekeeping missions.

NOTE: The USA is actively conducting military exercises with India's fragile neighbours such as Sri Lanka and Bangladesh. This reflects Washington's aspiration to expand its strategic presence and potentially establish a military foothold in the region, making this development geopolitically significant.

5TH COAST GUARD GLOBAL SUMMIT

Context:

India will host the 5th Coast Guard Global Summit (CGGS) in Chennai in 2027, aligning with the Golden Jubilee of the Indian Coast Guard.

About 5th Coast Guard Global Summit:

- **What it is:** A premier multilateral forum bringing together Coast Guards, maritime security agencies, and international organisations to discuss global maritime challenges.
- **Host:** Chennai.
- **Aim:**
  - Strengthen **global maritime cooperation** and **interoperability**.
  - Promote **trust-building**, information exchange, and collective response to maritime threats.
- **Features:**
  - **International Coast Guard Fleet Review** – showcasing global maritime capability and unity.
  - Symbolic of **India's commitment to SAGAR** (Security and Growth for All in the Region).

About Indian Coast Guard (ICG):

- **Who They Are?**
  - The Indian Coast Guard is India's **maritime law enforcement and search & rescue force**, operating under the Ministry of Defence. It is the **fourth armed force of India** and plays a crucial role in coastal security and EEZ protection.
- **Establishment:**
  - Concept accepted in early 1970s after recommendations of **Nag Committee (1970)** and **K.F. Rustamji Committee (1974)**.
  - Formally **raised on 1 February 1977** with 2 frigates & 5 patrol boats (transferred from Navy).
  - **Inaugurated on 19 August 1978** by PM **Morarji Desai** at Naval Dockyard, Mumbai.
- **First Director General:** Vice Admiral V.A. Kamath.
- **Functions:**
  - **Maritime Law Enforcement:** Anti-smuggling, anti-poaching, enforcement of Maritime Zones of India Act.

- **Search & Rescue (SAR):** Protects fishermen & seafarers in distress.
- **Maritime Environment Protection:** Pollution control & marine ecosystem preservation.
- **Offshore Security:** Safeguards vital offshore installations (e.g., Mumbai High).
- **Maritime Surveillance:** Patrols India's EEZ (2.01 million sq km).
- **National Security:** Works with Navy & other agencies for coastal defence.

DEFENCE PROCUREMENT MANUAL (DPM) 2025

Context:

Ministry of Defence approved Defence Procurement Manual (DPM) 2025, replacing the 2009 manual to accelerate revenue procurement and promote Aatmanirbharta.

About Defence Procurement Manual (DPM) 2025:

What it is?

- A **policy document** guiding all revenue procurement of goods/services for Armed Forces & MoD organisations, worth ~₹1 lakh crore annually.
- Updated after 16 years to align with **public procurement norms, technology adoption, and operational needs** of modern warfare.

Aim:

- **Streamline & Simplify:** Cut red tape, enable faster approvals, and avoid file movement delays.
- **Support Industry:** Address working capital issues, ease penalties, and provide order assurance.
- **Boost R&D & Innovation:** Collaborate with IITs, IISc, academia, and industry for indigenisation.

Key Features:

- **Ease of Doing Business:**
  - Removes redundant approvals, ensures **timely payment**, and promotes transparent, competitive bidding.
  - NOC requirement from DPSUs for open tenders **dispensed with** for level playing field.
- **Industry-Friendly Provisions:**
  - **Assured orders** up to 5 years (+5 years in special cases) for industry confidence.
  - Government to provide **technical handholding**, equipment sharing for prototype development.
- **Relaxed Penalties:**
  - **No Liquidated Damages (LD)** during development phase; minimal 0.1% LD post-prototype.
  - LD capped at **5% normally** (10% only in exceptional, prolonged delays) – incentivises genuine suppliers.
- **Decentralised Decision-Making:** Empowers **Competent Financial Authorities (CFAs)** at field level to extend delivery periods, revise bid dates, approve cases without file movement to higher levels.
- **Technology & Innovation Push:**
  - New chapter on **Innovation & Indigenisation** for in-house design, R&D with academia–industry collaboration.
  - Encourages development of **import substitutes** and local spare part production.
- **Collegiate Decision-Making:** Strengthens multi-level consultation for fair, transparent, and quicker decision-making process.
- **Repair & Maintenance Efficiency: Upfront 15% growth provision** in work contracts for aerial & naval platforms to reduce downtime.
- **Limited Tendering & Proprietary Procurement:**
  - Allows **limited tenders** for goods/services up to ₹50 lakh (higher in special cases).
  - Proprietary Article Certificate procurement allowed with parallel efforts to identify alternate sources.
- **Government-to-Government (G2G) Procurement:** Clear procedure for **high-value G2G deals** for faster acquisition of critical equipment.
- **Alignment with Finance Ministry Guidelines:** Fully synchronised with **Manual for Procurement of Goods (MoF)** ensuring transparency, fairness, and audit compliance.

BORDER WING HOME GUARDS (BWHGS)

Context:
MHA is considering raising Border Wing Home Guards (BWHGs) along the China border, on the lines of their deployment along the India–Pakistan border.

About Border Wing Home Guards (BWHGs):

- **What it is?**
  - A **voluntary auxiliary force** drawn from **local civilian population** living in border areas.
  - Acts as **support to Army and border guarding forces** during emergencies, conflict, and intelligence operations.
- **Origin & Ministry Involved:**
  - Raised under the **Home Guards Act, 1962**.
  - Comes under **Ministry of Home Affairs (MHA)**, coordinated with State Governments.
  - Seven States authorised: **Meghalaya, Tripura, Assam, West Bengal, Punjab, Rajasthan, Gujarat** (currently operational only in Rajasthan).
- **Aim / Objectives:**
  - **Supplement regular forces** by relaying information, aiding patrolling, and maintaining law and order.
  - **Mobilise border population** for security and community vigilance.
  - **Support disaster response** and logistical tasks during crises.
- **Key Features:**
  - **Voluntary Force:** Members enlisted for 3–4 years.
  - **Pay & Training:** 25% cost borne by Centre; daily pay ₹800–900, comparable to constable salary.
  - **Strength:** 2,279 active in Rajasthan (2025).
  - Played a crucial role in **Operation Sindoor**, proving effective in ground-level intelligence and communication.
- **Significance:**
  - **Force Multiplier:** Augments Army & ITBP presence across the 3,488-km LAC.
  - **Community Integration:** Builds trust with locals and acts as bridge between villagers & security agencies.
  - **Cost-Effective:** Uses local manpower with minimal infrastructure burden.

SAMUDRA PRADAKSHINA

Context:
Defence Minister of India virtually flagged off 'Samudra Pradakshina', the world's first tri-service all-women circumnavigation sailing expedition, from the Gateway of India, Mumbai.

About Samudra Pradakshina:

- **What it is?**
  - Samudra Pradakshina is **India's first-ever tri-service (Army, Navy, Air Force) all-women circumnavigation expedition**.
  - It involves sailing around the globe, crossing all longitudes and major oceans, meeting the World Sailing Speed Record Council's norms for a true circumnavigation.
- **Historical Context:**
  - Builds on India's rich circumnavigation legacy:
    - Capt. Dilip Donde (2009–10) – first solo Indian circumnavigation.
    - Cmde. Abhilash Tomy (2012–13) – first Indian non-stop circumnavigation.
    - INSV *Tarini* – **Navika Sagar Parikrama (2017–18)** & **Navika Sagar Parikrama-II (2024–25)** by all-women Indian Navy teams.
  - Inspired by global pioneers like Sir Robin Knox-Johnston (1969).
- **Aims & Objectives:**
  - **Symbol of Nari Shakti:** Showcase courage, resilience, and leadership of women in uniform.

- **Promote Jointness:** Strengthen synergy among Army, Navy, and Air Force.
- **Diplomatic Outreach:** Use port calls as platforms for military diplomacy & cultural exchange.
- **Scientific Research:** Collaborate with NIO to study micro-plastics, ocean biodiversity, and marine health.

- **Key Features:**
  - **Vessel:** IASV *Triveni*, a 50-foot indigenous yacht (Class A) built in Puducherry.
  - **Route:** ~26,000 nautical miles, easterly route, crossing Equator twice, rounding Capes Leeuwin, Horn, and Good Hope.
  - **Crew:** 10 women officers, led by **Lt Col Anuja Varudkar** (Army) **& Sqn Ldr Shraddha P Raju** (IAF).
  - **Timeline:** Sept 2025 – May 2026.
- **Significance:**
  - **Women Empowerment:** First global tri-service women-led expedition → milestone for gender inclusion in armed forces.
  - **Aatmanirbhar Bharat:** Showcases Indian shipbuilding and seamanship capabilities.
  - **Strategic Messaging:** Demonstrates India's maritime ambition & global engagement.

EXERCISE ZAPAD 2025

Context:

An Indian Armed Forces contingent has departed for Russia to participate in the multilateral military exercise *Zapad 2025* at Mulino Training Ground, Nizhniy.

About Exercise Zapad 2025:

- **What it is?**
  - Zapad 2025 is a multilateral military exercise hosted by Russia, designed to simulate high-intensity conventional warfare and counter-terrorism operations in multinational settings.
- **Nations Involved:** Primarily hosted by Russia with participation from India and several other partner nations.
- **Launched Since:** The *Zapad* (Russian for "West") exercise series has been conducted by Russia since the Soviet era, with the modern iterations starting in 2009 on a quadrennial basis. India previously participated in the 2021 edition.
- **Objectives:**
  - Strengthen defence cooperation and strategic trust between participating nations.
  - Enhance interoperability through joint tactical drills and planning.
  - Build capacity for counter-terrorism and conventional warfare scenarios.
  - Provide exposure to multinational combat environments and emerging technologies.
- **Features:**
  - **Venue:** Mulino Training Ground, Nizhniy, Russia.
  - **Participation:** Indian Army, Indian Air Force, and Indian Navy.
  - **Focus:** Joint company-level operations in open plains, tactical drills, arms skills, and special operations.
  - **Outcome:** Improved operational synergy, shared military learning, and stronger India–Russia defence ties.

TECHNOLOGY PERSPECTIVE AND CAPABILITY ROADMAP (TPCR-2025)

Context:

The Ministry of Defence's Technology Perspective and Capability Roadmap (TPCR) 2025 outlines plans to induct advanced weapons like hypersonic missiles, nuclear propulsion, directed-energy systems, and unmanned platforms over the next 15 years.

About Technology Perspective and Capability Roadmap (TPCR-2025):

What it is?

- A strategic document that lays out the **future technology and capability requirements** of the

Indian Army, Navy, and Air Force for the next 15 years.
- Acts as a guide for Indian industry, academia, and research institutions to align their R&D with the armed forces' long-term needs.

Published by:
- Released by the **Ministry of Defence (MoD), Government of India**.

Objective:
- To provide **early visibility of future requirements** to domestic manufacturers.
- Promote **indigenisation and self-reliance** in defence technologies.
- Ensure the Indian military is equipped to face **emerging multi-domain warfare challenges** including cyber, space, and AI-enabled conflicts.

Key Features of TPCR 2025: (No need to remember all the features, just have idea)

Navy
- Nuclear propulsion systems and a next-generation aircraft carrier equipped with Electromagnetic Aircraft Launch System (EMALS) → boosts India's long-range naval capability and reach in the Indo-Pacific region.
- Induction of destroyers, corvettes, Landing Platform Docks (LPDs), Autonomous Underwater Vehicles (AUVs), and fast interceptor craft → strengthens maritime security, anti-submarine capability, and coastal defence.

Army
- Replacement of ageing fleet with 1,800 Future Ready Combat Vehicles (FRCVs) and procurement of light tanks for high-altitude mountain operations → modernisation tailored for northern and western border challenges.
- Acquisition of Anti-Tank Guided Missiles (ATGMs), integration of Unmanned Aerial Vehicles (UAVs) with loitering munitions, and robotic systems for counter-Improvised Explosive Devices (counter-IED) → reflects preparation for network-centric and hybrid warfare.

Air Force
- Deployment of directed-energy weapons such as laser systems and stealth bomber drones → ensures stronger deterrence and deep-strike capability against adversaries.
- Use of High-Altitude Pseudo-Satellites (HAPS) and stratospheric airships → provides persistent Intelligence, Surveillance and Reconnaissance (ISR) and secure communications for two-front war scenarios.

Tri-Services (Army, Navy, Air Force Combined)
- Development and induction of over 500 hypersonic missiles with scramjet propulsion and universal missile launchers → enhances strategic deterrence and interoperability across all three services.
- Adoption of Artificial Intelligence (AI)-enabled cyber tools, quantum communication networks, and satellite-hardening measures → strengthens resilience against cyber warfare and space-based threats.

Cross-Cutting Technologies
- Use of Artificial Intelligence (AI), Machine Learning (ML), digital twin simulations, and autonomous systems → enables smart, data-driven and predictive warfare.
- Implementation of green logistics and energy-efficient systems → integrates sustainability with national defence strategy.

YUDH ABHYAS ARMY EXERCISE

Context:
India and the US have begun their largest-ever edition of the Yudh Abhyas Army exercise at Fort Wainwright, Alaska, despite rising bilateral tariff tensions

About Yudh Abhyas Army Exercise:
What it is?
- A **bilateral military exercise** between the Indian Army and the US Army, conducted annually to enhance defence cooperation.
- Focuses on **joint training in counter-terrorism, peacekeeping, and high-altitude warfare**.

Host (2025 edition): United States, at Fort Wainwright, Alaska in subarctic climate conditions.

History:
- Initiated in **2004** under the framework of India–US defence cooperation.
- Held alternately in India and the US, with scope and scale increasing over time.

Nations Participating:

- **India** – this year represented by **Madras Regiment soldiers**.
- **United States** – represented by the **5th Infantry Regiment "Bobcats" of the Arctic Wolves Brigade Combat Team, 11th Airborne Division**.

Aim:

- Strengthening **interoperability, trust, and coordination** between the two armies.
- Training for **high-altitude and extreme cold climate operations**, crucial for Himalayan and Arctic theatres.
- Enhancing joint capabilities in **counter-terrorism, peace support, and disaster relief operations**.

Features:

- **Duration:** Two weeks
- **Drills include:**
  - Joint heliborne operations
  - Surveillance and UAV deployment
  - Rock-craft and mountain warfare
  - Casualty evacuation & combat medical aid
  - Integrated use of artillery, aviation, and electronic warfare
- Parallelly, planning underway for the **Malabar Naval Exercise (Quad)** off Guam in November 2025.

BHAIRAV COMMANDO BATTALIONS

Context:

The Indian Army is raising the first five 'Bhairav' commando battalions to strengthen swift strike capabilities along the borders with China and Pakistan.

About Bhairav Commando Battalions:

- **What it is?**
  - Newly raised **light commando battalions** (250 soldiers each) under the "**Save and Raise**" approach.
  - Drawn from existing infantry battalions without fresh troop accretion.
  - Complements the Army's 10 Para-SF and 5 Para (Airborne) battalions.
- **Objective:**
  - Enhance **swift strike capability** along critical borders with China and Pakistan.
  - Relieve Para-Special Forces so they can focus on **strategic, high-risk missions** behind enemy lines.
  - Provide **rapid, high-impact response** in evolving battlefield conditions like drone-saturated environments.
- **Features:**
  - **Each unit:** ~250 soldiers, 7–8 officers.
  - **Training:** 2–3 months in regimental centres + 1 month with Special Forces for advanced training.
  - Equipped with **latest weapons, drones, surveillance systems, and tactical gadgets**.
  - **Agile and nimble**: Smaller than infantry (800) and Para-SF (620), but optimized for mobility and flexibility.
  - Locations: Initial 5 units—3 in Northern Command (Leh, Srinagar, Nagrota), 1 in western desert sector, 1 in eastern hilly terrain.
- **Functions:**
  - Conduct **reconnaissance, interdiction, and disruption** of enemy troops.
  - Provide **cross-border tactical support** in contested areas.
  - Operate in **all terrains** (mountains, deserts, border regions).
  - Supplement artillery and drone-based modern warfare units.
- **Significance:**
  - Bridges the **operational gap** between regular infantry and elite Special Forces.
  - Reflects Indian Army's **strategic modernization drive**: alongside Bhairav, new *Rudra* brigades, *Shaktibaan* regiments, and *Divyastra* batteries are being established

Sports

MEN'S CRICKET ASIA CUP 2025

Context:

India clinched its record 9th Asia Cup title by defeating Pakistan in the 2025 final at Dubai, with Tilak Varma's unbeaten 69 anchoring the chase.

About Men's Cricket Asia Cup 2025:

- **What it is?**
  - A **continental men's cricket championship** organised biennially to determine Asia's top team.
  - Matches are accorded **official ODI or T20I status** by the ICC.
- **Organised by:**
  - Conducted under the aegis of the **Asian Cricket Council (ACC)**, established in 1983 to promote goodwill and cooperation through cricket.
- **Mascot:**
  - The official mascot for Asia Cup 2025 was **"Sheru"**, symbolising strength, courage, and unity of Asian cricket.
- **History:**
  - **Inaugurated in 1984**, the Asia Cup is the **only continental cricket tournament**.
  - Hosted on a rotational basis; played alternately in **ODI and T20I formats** since 2016.
  - Political tensions have occasionally led to **boycotts**.
- **Key Features**
  - **Edition**: 17th Asia Cup (2025), hosted in the **UAE** due to India-Pakistan tensions.
  - **Format:** T20 International (T20I), with **8 teams** including ACC full members.
  - **Outcome:** India beat Pakistan by 5 wickets.
    - **Man of the Match (Final):** Tilak Varma (unbeaten 69 off 53)
    - **Man of the Series:** Abhishek Sharma
- **India and Asia Cup:**
  - India is the **most successful team**: 9 titles (7 in ODI, 2 in T20I).
  - Sri Lanka follows with 6 titles, Pakistan with 2.
  - India has remained **undefeated against Pakistan in Asia Cup 2025**.

THE WORLD PARA ATHLETICS CHAMPIONSHIPS 2025

Context:
India is hosting its first-ever World Para Athletics Championships 2025 in New Delhi, inaugurated at Jawaharlal Nehru Stadium.

About The World Para Athletics Championships 2025:

What it is?

- The **flagship global competition** for para-athletes, organised biennially by World Para Athletics (under IPC).
- Serves as the highest platform (after Paralympics) for **track & field events** for differently-abled athletes.

Host for 2025:

- New Delhi, India – first time India is hosting the Championships.
- **Venue:** Jawaharlal Nehru Stadium, with newly built **world-class Mondo track**.

Mascot:

- **"Viraaj" – a young elephant with a blade prosthesis**.
- Symbolises strength, optimism, inclusivity, courage, and resilience of para-athletes.

History:

- Para athletics first appeared at the **Stoke Mandeville Games (1952)**, later included in the **Rome 1960 Paralympics**.
- World Para Athletics Championships began in **1994 (Berlin, Germany)**.

Features of 2025 Championship:

- **Inclusivity**: Participation by high-support needs athletes and mixed-gender relay events.

- **Logo & Symbols**: Represent India's heritage, inclusivity, courage, and sporting excellence.
- **Message**: Highlights India's rising global sporting ambitions and commitment to diversity, equality, and accessibility.

HOCKEY ASIA CUP 2025

Context:

India defeated Korea 4-1 in the final of the Men's Hockey Asia Cup 2025 in Rajgir, Bihar, clinching their fourth title.

- With this victory, India also sealed direct qualification for the **2026 FIH Men's Hockey** World Cup **in Belgium and the Netherlands.**

About Hockey Asia Cup 2025:

- **What it is?**
  - A quadrennial international men's hockey tournament organised by the Asian Hockey Federation.
  - Considered the most prestigious continental hockey championship in Asia, offering a World Cup berth to the winner.
- **Host:**
  - Held in **Rajgir, Bihar**, from 29th August to 7th September 2025.
  - India hosted the tournament for the first time in Bihar, showcasing the state's growing role in global sports.
- **Mascot:**
  - **Chaand**, a fierce tiger draped in a red cape and crowned with a magician's hat.
  - Symbolises skill, courage, agility, and pride, inspired by Bihar's Valmiki Tiger Reserve.
- **Winner (2025 Edition):**
  - **India** lifted the trophy by defeating defending champions Korea 4-1 in the final.
  - This marked India's **4th Asia Cup title**, joining Pakistan (3 titles) and Korea (5 titles) among the top winners.
- **Features:**
  - 12th edition of the Men's Asia Cup.
  - Acts as a **qualifier for the FIH Men's Hockey World Cup**.
  - Highlights India's unbeaten run in the tournament, with strong wins over China (7-0) and Malaysia.

Miscellaneous

OPERATION WEED OUT

Context:

The Directorate of Revenue Intelligence (DRI) has seized 108.67 kg of hydroponic weed in less than 20 days under its ongoing "Operation Weed Out" across India.

About Operation Weed Out:

What It Is?

- A **nationwide anti-drug enforcement drive** targeting trafficking syndicates smuggling hydroponic cannabis into India.

Launched By:

Directorate of Revenue Intelligence (DRI) under the Central Board of Indirect Taxes and Customs (CBIC), Ministry of Finance.

Objective:

- Curb the **illegal inflow of hydroponic weed** (high-potency cannabis) from Southeast Asia.
- Disrupt **drug syndicates** and prevent the circulation of narcotics in India.
- Support the government's mission of **Nasha Mukt Bharat Abhiyan** (Drug-Free India).

Key Features

- **Intelligence-Driven Operations:** Targeted interception based on specific intelligence inputs.
- **Pan-India Coverage:** Simultaneous crackdowns in airports and cities across the country.
- **Multi-Agency Coordination:** Cooperation with airport security, customs, and state police.

- **Financial Trail Investigations:** Seizure of drug money and identification of financiers/masterminds.
- **Legal Action:** Arrests under **NDPS Act, 1985** with strict prosecution.

Significance:

- **Protects Public Health:** Prevents large-scale drug abuse, especially among youth.
- **National Security:** Disrupts international narco-networks that exploit India as a market.
- **Economic Impact:** Cuts off illegal proceeds fueling organized crime.

DRAFT CIVIL DRONE (PROMOTION AND REGULATION) BILL, 2025

Context:

The Ministry of Civil Aviation released the draft Civil Drone (Promotion and Regulation) Bill, 2025 for public consultation.

About Draft Civil Drone (Promotion and Regulation) Bill, 2025:

What It Is?

- A comprehensive legislation to **regulate, promote, and secure unmanned aircraft systems (UAS)** in India.
- Seeks to **repeal the Drone Rules, 2021** and create a robust legal framework.

Ministry: Ministry of Civil Aviation (MoCA) – with DGCA as the primary regulator.

Objective:

- Ensure **safe, secure, and responsible use of drones**.
- Promote **innovation, industry growth**, and integration of drones into civil airspace.
- Protect **public safety and privacy** through stricter compliance and penalties.

Key Features:

- **Mandatory Registration:** Unique Identification Number (UIN) required for all drones.
- **Type Certification:** DGCA approval mandatory for manufacturing, sale, and operation.
- **Remote Pilot Requirement:** Valid remote pilot certificate compulsory.
- **Digital Sky Zones:**
  - **Green Zone:** Free flying allowed.
  - **Yellow Zone:** ATC clearance needed.
  - **Red Zone:** Central govt. permission mandatory.
- **Compulsory Insurance:** Third-party coverage for all drone operators.
- **Safety & Security Features:** Anti-tampering, traceability, and airworthiness compliance.
- **Strict Penalties:**
  - Jail term: 3 months – 3 years.
  - Fine: Up to ₹1 lakh.
  - Cognisable offences for restricted zone violations.
- **Confiscation Powers:** DGCA/police can seize drones, electronic records, and devices in case of violations.
- **Victim Compensation:**
  - ₹2.5 lakh for death, ₹1 lakh for grievous injury.
  - Claims handled by **Motor Accident Claims Tribunal**

BHARAT RATNA DR. BHUPEN HAZARIKA

Context:

Assam has launched year-long celebrations marking the birth centenary of Bharat Ratna Dr. Bhupen Hazarika, with tributes from national leaders and cultural events across the state.

About Bharat Ratna Dr. Bhupen Hazarika:

- **What it is?**
  - Dr. Bhupen Hazarika (1926–2011), known as *Sudhakantha* (nectar-voiced) and the *Bard of Brahmaputra*, was an iconic Indian singer,

composer, lyricist, poet, filmmaker, and public intellectual.

- **Birth & Background:**
  - Born on **8 September 1926** in Sadiya, Assam.
  - Grew up in Assam's folk traditions, recording his first song at age 10 on All India Radio, Kolkata.
  - Completed **MA in Political Science (BHU)** and **PhD in Mass Communication (Columbia University, 1952)**, where he was inspired by Paul Robeson and global civil rights movements.
- **Contributions:**
  - **Music & Lyrics**: Created evergreen songs like *Manuhe Manuhar Babe*, *Moi Eti Jajabor*, *Bistirno Parore*, blending Assamese folk with universal messages of humanity, justice, and harmony.
  - **Cinema**: Directed/produced Assamese films (*Era Bator Sur, Chameli Memsaab*), and composed music for Hindi and Bengali films (*Rudaali, Daman, Saaz*).
  - **Social Voice**: His art addressed poverty, inequality, caste, and marginalisation, making him a cultural unifier of Northeast India with the rest of the country.
  - **Public Service**: Served as **Chairman, Sangeet Natak Akademi** and was elected as an MLA in Assam (1967).
- **Significance:**
  - **Cultural Icon**: Redefined Assamese identity and integrated Northeast's voice into India's mainstream.
  - **Global Influence**: His works carried universal themes of brotherhood and equality, resonating beyond India.
  - **Awards & Recognition**: Dadasaheb Phalke Award, Padma Bhushan, Padma Vibhushan, and posthumously, **Bharat Ratna (2019)**.

CABINET CLEARS ₹1,500 CR SCHEME TO PROMOTE CRITICAL MINERAL RECYCLING

Context:

The Union Cabinet has approved a ₹1,500 crore scheme under the National Critical Mineral Mission (NCMM) to promote recycling of e-waste, lithium-ion batteries, and catalytic converters for recovery of critical minerals.

About *Cabinet clears ₹1,500 cr scheme to promote critical mineral recycling:*

What it is?

- A government incentive scheme worth ₹1,500 crore to promote **recycling of e-waste and battery waste** for recovery of critical minerals.
- It will serve as a **near-term solution** until mining and exploration projects begin to yield results.

Launched under: National Critical Mineral Mission (NCMM).

Ministry: Ministry of Mines.

Aim:

- To **strengthen India's supply chain resilience** for critical minerals.
- To create a **domestic recycling ecosystem** for securing raw materials needed for clean energy, EVs, and electronics industries.

Features:

- **Duration**: Six years (2025-26 to 2030-31).
- **Eligible feedstock**: e-waste, lithium-ion battery scrap, catalytic converters from end-of-life vehicles.
- **Beneficiaries**: Both large recyclers and startups; 1/3rd of financial outlay earmarked for small/new recyclers.
- **Incentives**:
  - 20% capital subsidy on plant, machinery, and utilities.
  - Operating expense subsidy linked to incremental sales over the base year.
  - Subsidy disbursal in two parts: 40% (2nd year) + 60% (5th year).
- **Cap**:
  - Large units – ₹50 crore (₹10 crore for OPEX).
  - Small units – ₹25 crore (₹5 crore for OPEX).
- **Support** for new units as well as expansion, modernization, and diversification of existing ones.

Significance:

- Expected to create **270 kilo tons annual recycling capacity**.
- Yield **~40 kilo tons of critical minerals** annually.
- Attract **₹8,000 crore investment**.
- Generate **~70,000 jobs (direct + indirect)**.

MAPPING

NAURU

Context:
Australia has signed a $267 million deportation deal with Nauru to relocate non-visa holders, sparking criticism from refugee and human rights groups.

About Nauru:

- **What it is?**
  - Officially the **Republic of Nauru**, a sovereign island country and microstate in the South Pacific Ocean.
  - Known historically as "Pleasant Island."
- **Located in:**
  - Micronesia subregion of Oceania.
  - About **300 km west of Banaba (Kiribati)**.
- **Capital:** Yaren District (de facto capital, as Nauru has no official capital).
- **Neighbouring:**
  - Surrounded by the Pacific Ocean; nearest land is Banaba (Kiribati).
  - **Other distant neighbours**: Solomon Islands, Marshall Islands, and Tuvalu.
- **Features:**
  - **Area:** Only **21 sq km** (third-smallest country after Vatican and Monaco).
  - **Population:** ~10,800 (world's third-smallest sovereign state).
  - **Economy:** Once rich in **phosphate mining**, now environmentally degraded and economically dependent on Australia.
  - Member of the **United Nations, Commonwealth of Nations, and ACP Group**.
  - Known for hosting **Australia's offshore refugee processing centre** since 2001.
- **Australia–Nauru Agreement (2025):**
  - Australia will pay **A$408 million ($267M) upfront** and **A$70M annually** after deportees arrive.
  - Targets individuals released after Australia's 2023 High Court ruling ending indefinite immigration detention.
  - Criticised as violating **international refugee protections**.

AFGHANISTAN

Context:
A 6.0-magnitude earthquake struck eastern Afghanistan near Jalalabad, killing over 800 people and injuring at least 2,800, with widespread destruction across Kunar, Nangarhar, and Laghman provinces.

About Afghanistan:

- **What it is?**
  - A **landlocked, multi-ethnic country** in south-central Asia, historically at the crossroads of trade routes linking South Asia, Central Asia, the Middle East, and Europe.
  - Known for its strategic location in the "Great Game" between Britain and Tsarist Russia, and later as the theatre of Cold War conflicts.
- **Capital:** Kabul
- **Neighbouring Nations:** Pakistan, India, Iran, Turkmenistan, Uzbekistan, Tajikistan, and short border with Xinjiang (China) via Wakhan Corridor.
- **Geographic & Natural Features:**
  - **Mountains**
    - **Hindu Kush range** dominates, forming part of the greater Himalayan chain.
    - Peaks rise above 6,000 m; important passes: **Khyber Pass, Shebar Pass**.
    - Frequent earthquakes due to tectonic activity at the **Eurasian–Indian plate junction**.
  - **Rivers**
    - **Amu Darya** (north) – frontier with Central Asia.
    - **Kabul River** – flows into the Indus (Pakistan).

- **Helmand River** – longest (715 miles), drains southwest into Sistan Basin.
- **Hari Rud** – forms part of Afghanistan–Iran border.

- **Regions**
  - **Central Highlands**: rugged mountains, seismic zone.
  - **Northern Plains**: fertile, densely populated, with gas reserves.
  - **Southwestern Plateau**: deserts (Registan, Margow), arid climate, scattered rivers.

SEYCHELLES

Context:

The Indian Navy's First Training Squadron (INS Tir, INS Shardul, and ICGS Sarathi) docked at Port Victoria, Seychelles, for a long-range training deployment, strengthening maritime ties between India and Seychelles.

About Seychelles:

- **What it is?**
  - A small **island nation** and **archipelagic state** in the Indian Ocean.
  - Known for its diverse cultural blend and high human development in Africa.
- **Location:**
  - Northeast of **Madagascar** and about **1,500 km east of mainland Africa**.
  - Lies in the **Southwest Indian Ocean Region**, strategically close to key sea lanes.
- **Capital:** Victoria, one of the world's smallest capitals.
- **Neighbours:**
  - Island countries and territories nearby include **Maldives, Mauritius, Comoros, Madagascar**, and French territories like **Réunion and Mayotte**.
- **Key Features:**
  - **Geography** – An archipelago of **115 islands**, only a few are inhabited.
  - **Society** – Multicultural mix (French, British, Indian, African, Chinese) reflected in Creole language, festivals, cuisine, and architecture.
- **Significance for India:**
  - **Maritime Security** – Strategic location in the Indian Ocean; key partner in ensuring freedom of navigation and countering piracy.
  - **Defence Partnership** – India provides capacity-building, naval training, and equipment support to Seychelles' Defence Forces.

SUDAN

Context:

A massive landslide in Sudan's Darfur region has killed over 1,000 people, flattening an entire mountain village in the **Marra mountains.**

About Sudan:

- **What it is?**
  - A country in **northeastern Africa**, historically called *bilād al-sūdān* ("land of the blacks") by medieval Arab geographers.
  - Independent since **1956**; currently ruled under a **transitional government** led by President Gen. Abdel Fattah al-Burhan.
- **Location:**
  - Situated at the **junction of Africa and the Arab world**, influenced by both Mediterranean and African cultures.
  - Once the largest African country before **South Sudan's secession in 2011**.

- **Capital:** Khartoum, located at the confluence of the **White Nile and Blue Nile** rivers.
- **Neighbouring Nations:** Egypt, Red Sea, Eritrea, Ethiopia, South Sudan, Central African Republic, Chad, and Libya.
- **Key Physical Features:**
    - **Mountains:** Marra Mountains in Darfur (volcanic highlands, elevations up to 3,000 m), Nuba Mountains (inselbergs).
    - **Rivers:** Dominated by the **Nile system** – White Nile and Blue Nile joining at Khartoum.
    - **Landforms:** Vast deserts in the north, sand dunes (Qawz region), Red Sea Hills in the northeast, clay plains in the south-central region.
    - **Soils:** Fertile alluvial clays in Gezira plain, contrasting with barren sandy and rocky deserts.

LIPULEKH PASS

Context:
Nepal Prime Minister raised the Lipulekh Pass issue with Chinese President Xi Jinping during the SCO Summit 2025 in Tianjin, asserting Nepal's territorial claim.

About Lipulekh Pass:

- **What it is?**
    - A **high-altitude mountain pass** in the Himalayas, historically used for trade and pilgrimage between India and Tibet (China).
- **Location:** Situated in the **Pithoragarh district of Uttarakhand, India**, close to the **trijunction of India, Nepal, and China** in the Kumaon region.
- **Altitude:** Stands at around **5,334 meters (17,500 feet)**, making it one of the highest and most strategic passes in the region.
- **Features:**
    - Gateway for the **Kailash Mansarovar Yatra** pilgrimage.
    - Acts as a vital **trade route** between India and Tibet.
    - Opened as India's **first border trade post with China in 1992**, followed later by Shipki La (1994) and Nathu La (2006).
    - Known for its **rugged terrain and strategic positioning** in the Himalayas.
- **Significance:**
    - **Geopolitical importance** due to its location near the trijunction.
    - Critical for **Indo–China trade and border management**.
    - A key point of **India–Nepal boundary dispute**, especially after Nepal's 2020 map claim.
- **Issue surrounding Lipulekh Pass:**
    - **India** considers Lipulekh, Kalapani, and Limpiyadhura part of **Uttarakhand's Pithoragarh district** and has maintained administrative control for decades.
    - **Nepal** claims the area as part of its territory and in **2020 published a new political map** incorporating these regions, embedding it in its constitution.
    - **China**, while using Lipulekh for trade with India, treats it as an **India–Nepal bilateral dispute** and avoids direct involvement.

MAURITIUS

Context:
Mauritius Prime Minister Navinchandra Ramgoolam will undertake a state visit to India this September, his first overseas bilateral visit in his current term.

About Mauritius:

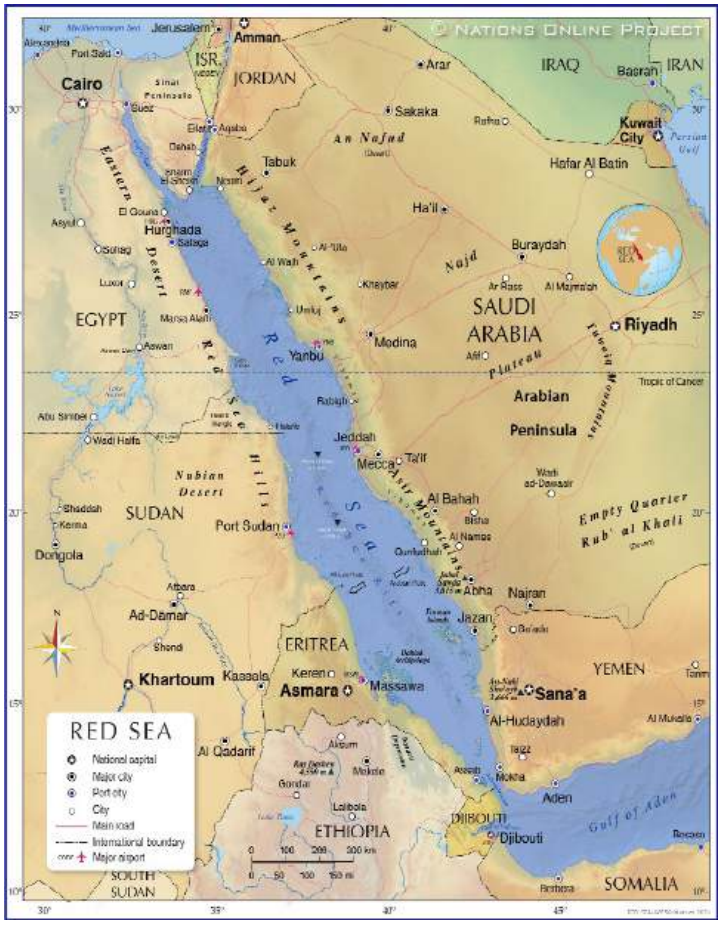
- **What it is?**
    - An **island country in the Indian Ocean**, part of the Mascarene Islands, known for its volcanic origin, multicultural society, and historical Indo-Mauritian connections.

- **Located in**:
  - About **800 km east of Madagascar** in the Indian Ocean.
  - Outlying territories include **Rodrigues Island, Cargados Carajos Shoals, and Agalega Islands.**
- **Capital**: Port Louis.
- **Features**:
  - **Volcanic origin**, encircled by coral reefs; highest point is **Piton de la Petite Rivière Noire (828 m)**.
  - **Rivers & lakes**: Grand River South East, Black River, and Lake Vacoas (chief water source).
  - **Climate**: Maritime subtropical with hot (Dec–Apr) and cool (Jun–Sep) seasons.
  - **Economy & land use**: Sugarcane dominates agriculture, also tea and vegetables.
  - **People**: ~1.23 million (2025 est.); majority Indo-Mauritian (descendants of indentured labourers), with Creole, Franco-Mauritian, Chinese minorities.

RED SEA

Context:

Cuts to undersea internet cables in the Red Sea disrupted connectivity across Asia and the Middle East, affecting major subsea systems like SMW4 and IMEWE, leading to slowdowns in India and neighbouring regions.



About Red Sea:

- **What it is?**
  - A **narrow inland sea** forming part of the rift valley system between **northeastern Africa and the Arabian Peninsula.**
  - Known for its strategic importance as a global trade and shipping route, linking to the Mediterranean Sea via the Suez Canal and to the Arabian Sea via Bab el-Mandeb Strait.
- **Neighbouring Nations:** Egypt, Sudan, Eritrea, Djibouti, Saudi Arabia and Yemen.
  - Extends about **1,930 km** southeastward from Suez (Egypt) to Bab el-Mandeb (Yemen).
  - Jordan and Israel have coastlines on the Gulf of Aqaba.
- **Features:**
  - **Geology:** Lies in a rift depression, still geologically active with volcanic and seismic activity.
  - **Unique water conditions:** Among the hottest and saltiest seas; supports rich coral reef ecosystems.
  - **Economic importance:** One of the world's busiest maritime corridors connecting Europe, Asia, and Africa.

About Undersea (Submarine) Cables:

- **What it is?**
  - Fiber-optic cables laid on seabeds that carry the vast majority (~95%) of international data traffic across continents.
- **Features:**
  - **Composition**: Bundles of glass fibers enclosed in protective layers and each fiber transmits data using pulses of light.
  - **Capacity**: High-speed, low-latency connectivity enabling global internet, cloud services, and international communication.
  - **Vulnerability**: Susceptible to breakage from natural disasters, anchor drags, earthquakes, or sabotage.

CARIBBEAN REGION

Context:

The US deployed F-35 fighter jets, naval warships, and thousands of Marines to the southern Caribbean amid rising tensions with Venezuela.

About Caribbean Region:

- **What it is?**
  - A **geographic and cultural region** comprising the **Caribbean Sea, its islands, and surrounding coasts**.
  - Often called the **West Indies**, it includes more than **7,000 islands, islets, cays, and reefs**.
- **Location:**
  - Lies southeast of the Gulf of Mexico, east of Central America & Mexico, and north of South America.
  - Surrounded by the **Atlantic Ocean to the north and east**, and the **Caribbean Sea to the south**.
- **Nations Found:**
  - **13 independent island nations** (e.g., Jamaica, Cuba, Haiti, Dominican Republic, Trinidad & Tobago, Barbados, Grenada, Saint Lucia).
  - Several **territories and dependencies** of the USA, UK, France, and the Netherlands (e.g., Puerto Rico, Martinique, Aruba).
- **History:**
  - Indigenous people (Taino, Carib, Arawak) lived here until **1492**, when **Christopher Columbus** arrived.
  - The region was colonised by European powers; African slaves were brought in for **sugar and tobacco plantations.**
  - Known historically for **piracy, colonial wars, and slave trade**, later evolving into a hub of **Afro-European cultural fusion**.
- **Features:**
  - **Strategic Location:** Lies at the crossroads of the Atlantic Ocean, Gulf of Mexico, and Panama Canal, making it vital for global maritime trade and naval presence.
  - **Geopolitical Significance:** A hotspot of US influence, Cold War rivalries, and ongoing tensions (e.g., Cuba crisis, current US–Venezuela standoff).
  - **Cultural Diversity:** Fusion of **African, European, indigenous, and Asian cultures**, with multiple languages (English, Spanish, French, Dutch, Creole).
  - **Security Concerns:** A hub for **drug trafficking routes**, organised crime, and maritime piracy, necessitating global naval patrols.
  - **Regional Cooperation:** Institutions like **CARICOM** promote economic integration, disaster management, and diplomatic voice of small island nations.

NEPAL

Context:

Nepal's President Ram Chandra Paudel has appealed for peaceful dialogue amid the ongoing Gen-Z protests triggered by political unrest following PM K.P. Sharma Oli's resignation.

About Nepal:

- **What it is?**
  - Nepal is a landlocked Himalayan country in South Asia, known for its unique cultural and geographical diversity.
- **Capital:** Kathmandu.
- **Neighbouring Nations:** Bordered by India (east, south, west) and China (north).
- **Geographic Features:**
  - **Rivers:** Kosi, Narayani (Gandak), Karnali—important for irrigation and hydropower.
  - **Mountains:** Contains world's highest peaks—Mount Everest, Kanchenjunga, Annapurna.
  - **Climate:** Ranges from subtropical Tarai to alpine Himalayan conditions.
- **Political Setup:**
  - **System:** Federal Democratic Republic (since 2008, monarchy abolished).
  - **Head of State**: President – ceremonial, elected by Electoral College, Commander-in-Chief.
  - **Head of Government**: Prime Minister – real executive authority, appointed by President, accountable to Parliament.

- **Legislature:** Bicameral Federal Parliament → House of Representatives (directly elected, 275) + National Assembly (indirect, provinces).

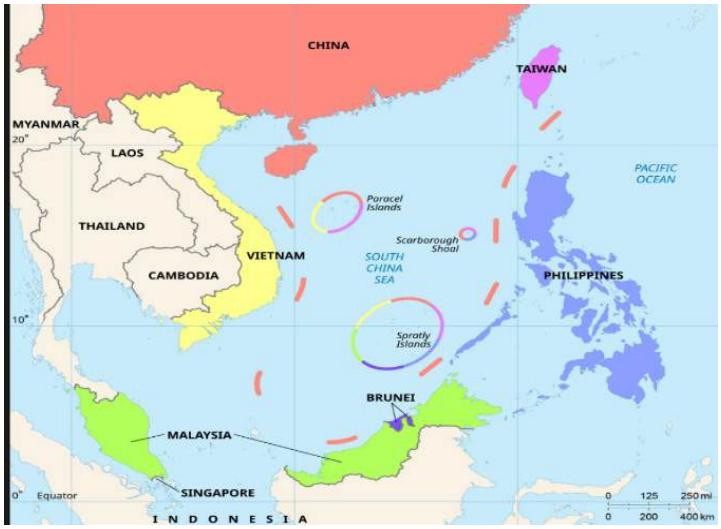
Gen-Z Protest in Nepal:

- **What it is?** A mass youth-led uprising, largely by Generation Z, demanding accountability, transparency, and democratic freedoms.
- **Reasons for Protest:**
  - Government's **ban on 26 social media platforms** (Facebook, Instagram, WhatsApp, YouTube) citing tax and cybersecurity concerns.
  - Rising frustration with **corruption, nepotism, and lack of governance transparency**.

HUANGYAN ISLAND (SCARBOROUGH SHOAL)

Context:

China announced the creation of a national nature reserve on Huangyan Island (Scarborough Shoal) in the South China Sea.



About Huangyan Island (Scarborough Shoal):

- **What it is?**
  - A **disputed coral atoll** in the South China Sea, also called Scarborough Shoal (English), Huangyan Island (China), and Panatag Shoal (Philippines).
- **Location:** About 220 km west of Luzon (Philippines) and near the Manila Trench.
- **History:**
  - First appeared on the **1734 Velarde Map** of the Philippines, claimed under Spanish rule and later the **Treaty of Washington (1900)**.
  - Named "Scarborough" after the British ship that grounded there in **1748**.
  - Subject of the **2012 Scarborough Shoal standoff** between China and the Philippines.
  - In **2016**, the **Permanent Court of Arbitration (PCA)** under UNCLOS invalidated China's "nine-dash line" claims but did not rule on sovereignty.
- **Dispute:**
  - Claimed by China, Taiwan, and the Philippines.
  - Strategic for fisheries, hydrocarbon resources, and military presence.

About South China Sea:

- **Location:**
  - A marginal sea of the **western Pacific Ocean**, bounded by:
    - **Northeast**: Taiwan Strait, linking to East China Sea.
    - **East**: Philippines.
    - **South**: Borneo, Gulf of Thailand, Malay Peninsula.
    - **West/North**: Asian mainland (China, Vietnam).
- **Features:**
  - Contains **Spratly Islands, Paracel Islands, Scarborough Shoal, and Macclesfield Bank**.
  - Vital trade route – ~1/3rd of global shipping passes through.
  - Rich in oil, gas, and fisheries resources.
  - **Strategic chokepoints:** Luzon Strait, Malacca Strait, Taiwan Strait.

THE PHILIPPINE ISLAND OF PUGAD

Context:

The Philippine Island of Pugad is facing severe land subsidence (up to 11 cm/year) and rising sea levels, putting its 2,500 residents at risk of displacement.

- Scientists warn that parts of **Bulacan province** could sink completely, as sea levels in the Philippines are rising three times faster than the global average.

About Philippine Island of Pugad:

- **What it is?**
  - A small, 7-hectare island in Manila Bay, part of Hagonoy municipality in Bulacan province.
  - Densely populated, with ~2,500 residents, primarily engaged in fishing & aquaculture.
- **Location:**
  - Lies at the **mouth of the Angat–Pampanga River Delta**, historically surrounded by mangroves and marshlands.
- **Issues & Challenges:**
  - **Land Subsidence:** Sinking at **~11 cm/ year**, fastest in the Philippines due to groundwater over-extraction.
  - **Sea-Level Rise:** Philippines' sea level rise is **3× global average (3.6 mm/yr)**; may accelerate to **13 mm/yr**.
  - **Climate Hazards:** Frequent floods, typhoons, and storm surges disrupt lives & livelihoods.
  - **Loss of Mangroves:** Conversion to fishponds reduced natural protection, increasing vulnerability

About Philippines:

- **What it is?**
  - A Southeast Asian **archipelago nation** comprising **7,000+ islands** in the western Pacific Ocean.
- **Location & Neighbours:**
  - Situated about **800 km east of Vietnam**, bounded by **Philippine Sea (east)**, **South China Sea (west)**, and **Celebes Sea (south)**.
- **Capital:** Manila (Quezon City is most populous).
- **Features:**
  - **Coastline:** 22,550 miles (36,290 km) → highly vulnerable to climate change.
  - **Mountains & Volcanoes:** ~50 volcanoes (active & dormant), Mount Apo is the highest (2,954 m).
  - **Climate:** Tropical, prone to typhoons, floods, earthquakes & volcanic eruptions.

GANDHI SAGAR WILDLIFE SANCTUARY

Context:
Madhya Pradesh has initiated a cheetah mating programme in Gandhi Sagar Wildlife Sanctuary to create a second viable home for cheetahs after Kuno National Park.

About Gandhi Sagar Wildlife Sanctuary:

- **What It Is?**
  - A protected sanctuary known for its rich biodiversity and mixed deciduous forests.
- **Location:** Situated on the northern boundary of **Mandsaur and Neemuch districts**, Madhya Pradesh, adjoining Rajasthan.
- **Established:** Notified in **1974** and expanded in **1983**.
- **Geography:** Spread over **368.62 sq. km**, bisected by the **Chambal River**, with grasslands and dry forests — ideal cheetah habitat.
- **Flora & Fauna:**
  - Dominated by **Khair, Salai, Kardhai, Tendu, Palash** trees.
  - Fauna includes **chinkara, sambar, nilgai, leopard, wild dog, otter, peacock** and **mugger crocodile**.
- **Cultural Significance:**
  - Houses Chaturbhujnath temple, Hinglajgarh Fort, Bhadkaji rock paintings, Dharmrajeshwar caves, showcasing heritage importance.

About Cheetah Mating Programme at Gandhi Sagar:

- **What It Is?**
  - A scientific breeding initiative to mate relocated female cheetahs with existing male coalition in Gandhi Sagar.
- **Aim:** Build a **self-sustaining cheetah population**, reduce overdependence on Kuno, and restore India's grassland ecology.
- **Features:**
  - **Pre-Mating Monitoring:** Male and female kept in separate enclosures; behaviour observed to avoid aggression (learning from Kuno's 2023 incident).
  - **Safe Denning Sites:** Relocation of 17 leopards done to reduce predation risk.
  - **Nutritional Management:** Prey

supplementation and 15–20 kg feed provided every 3–4 days during gestation.
- **Veterinary Surveillance:** Biweekly pregnancy checks, remote den monitoring, and cub health assessments post-birth.

SALAMIS BAY

Context:
INS **Trikand**, a stealth frigate of the Indian Navy, reached **Salamis Bay, Greece**.

- It will participate in the **first-ever bilateral maritime exercise between India and Greece** to boost interoperability and naval cooperation.

About Salamis Bay:

- **What it is?**
  - A natural bay on the west coast of Salamis Island, Greece, connected to the Saronic Gulf.
- **Location:** Situated in the Aegean Sea region, about 16 km from Athens, near Salamis town.
- **Features:**
  - Maximum length ~9 km, Cape Petriti forms its southwestern end.
  - Historically significant — site of the famous **Battle of Salamis (480 BCE)** where the Greeks defeated the Persians.

About Greece:

- **Location:** Southeastern Europe, southern tip of the Balkan Peninsula.
- **Capital:** **Athens** (largest city), followed by Thessaloniki and Patras.
- **Neighbouring Nations:** Shares borders with Albania, North Macedonia & Bulgaria, Turkey.
- **Key Features:**
  - Known as the **cradle of Western civilisation** and **birthplace of democracy**.
  - Possesses the **longest Mediterranean coastline** with thousands of islands.
  - Home to **20 UNESCO World Heritage Sites**, preserving ancient temples, theatres, and Byzantine monuments.

TIPESHWAR WILDLIFE SANCTUARY (TWS)

Context:
Five individuals were arrested for poaching an Indian Pangolin in Tipeshwar Wildlife Sanctuary (TWS), Yavatmal, Maharashtra.

About Tipeshwar Wildlife Sanctuary (TWS):

- **What it is?**
  - A protected wildlife sanctuary **and tiger reserve** in Maharashtra.
  - Known for its **high tiger density** and rich biodiversity.
  - Offers a lesser-crowded safari experience compared to Tadoba.
- **Location:**
  - Situated in **Pandarkawada region of Yavatmal district, Maharashtra**.
  - Covers an area of **148.63 sq. km**.
  - Named after **Goddess Tipai** whose shrine lies in Tipeshwar village.
- **History & Conservation:**
  - Declared a **Wildlife Sanctuary** under the Wildlife (Protection) Act, 1972.
  - Gained attention as the home of **Tigress Avni**, on whom Vidya Balan's film *Sherni* was loosely based.

- Dedicated conservation efforts since 2010 have increased tiger population from **3 to 20**.

- **Key Features:**
  - **Flora:**
    - Teak covers ~60% of vegetation; Red Sandalwood ~15%.
    - Rich in Mahua, Achar, Lendia, Tiwas, and ~250 species of bamboo.
  - **Fauna:**
    - Hosts tigers, leopards, sloth bears, hyenas, jackals, chital, sambar, wild boar, and Indian pangolins.
    - Home to **26 reptile species** and rare mammals like Rusty Spotted Cat & False Vampire Bat.
  - **Avifauna:**
    - Birdwatcher's paradise with **256 bird species** — resident, migratory, and rare.
    - Painted Francolin, Rain Quail, Lesser Whistling Duck, and Eurasian Wryneck are highlights.
  - **Butterfly Diversity:** 97 butterfly species, including rare ones like Black Rajah & Peacock Royal.
  - **Ecotourism Potential:** Offers jeep safaris, nature trails, and rural tourism opportunities supporting local livelihoods.

QATAR

Context:

India condemned the recent attacks in Doha at the UNHRC, calling it a violation of Qatar's sovereignty.

- India reiterated support for Qatar's security and regional peace, without naming Israel, which has claimed responsibility.

About Qatar:

- **What It Is?**
  - A **sovereign country in West Asia**, officially known as the **State of Qatar**.
  - Ruled as a **hereditary monarchy** by the **House of Thani** since 1868; gained independence in **1971**.
- **Borders:** Shares a single land border with Saudi Arabia and surrounded by the **Persian Gulf** on other sides.
- **Nearby:** Separated from Bahrain by the Gulf of Bahrain.
- **Topography:** Mostly flat, low-lying desert peninsula.
- **Capital:** Doha (home to 80%+ of population).
- **Key Features:**
  - **Economy:**
    - High-income economy, backed by **3rd-largest natural gas reserves** and significant oil reserves.
    - One of the **largest exporters of LNG** globally.
    - Among the world's highest GDP (PPP) per capita and GNI per capita.
  - **Politics:**
    - Emir holds executive, legislative, judicial powers and partially elected Consultative Assembly can block legislation.
  - **Strategic Role:**
    - Member of **GCC** and a major **non-NATO ally of the U.S.**
    - Hosts major U.S. military base at Al Udeid.
    - Influential through **Al Jazeera Media Network** and active in regional diplomacy.

MACHU PICCHU

Context:

Peru evacuated 1,600 tourists from Machu Picchu after protests blocked train access, demanding inclusion in the bidding process for a new bus operator.

About Machu Picchu:

What It Is?

- A **15th-century Inca citadel** and one of the **New Seven Wonders of the World**.
- A **UNESCO World Heritage Site (1983)** and Peru's most iconic tourist destination, attracting ~4,500 visitors daily.
- Known for its remarkable preservation and engineering brilliance, combining **ceremonial, residential, and agricultural areas**.

Location:

- Situated ~80 km northwest of Cusco, Peru, in the Cordillera de Vilcabamba, Andes Mountains.
- Perched at 2,350 m (7,710 ft) above sea level, overlooking the Urubamba River Valley.
- Lies between two peaks – **Machu Picchu ("Old Peak")** and **Huayna Picchu ("New Peak")**.

Origin & History:

- Built during reign of **Pachacuti Inca Yupanqui (c. 1438–1471)** as a royal estate or retreat.
- Abandoned in the mid-16th century, likely due to Spanish conquest and lack of water.
- **Rediscovered in 1911** by Yale professor **Hiram Bingham**, guided by local Melchor Arteaga.

Key Features:

- **Urban Layout:** Divided into ceremonial, agricultural, and residential sectors connected by thousands of stone-cut steps.
- **Agricultural Terraces:** Ingenious aqueduct system for irrigation.
- **Notable Structures:**
  - **Temple of the Sun** – Sacred ceremonial site.
  - **Temple of the Three Windows** – Features trapezoidal Inca architecture.
  - **Intihuatana Stone** – A carved ceremonial sundial.
  - **Royal Tombs & Palaces** – Indicate its use as a royal estate.
- **Access:** By train to Aguas Calientes + bus ride or hiking the **Inca Trail (3–6 days)**.

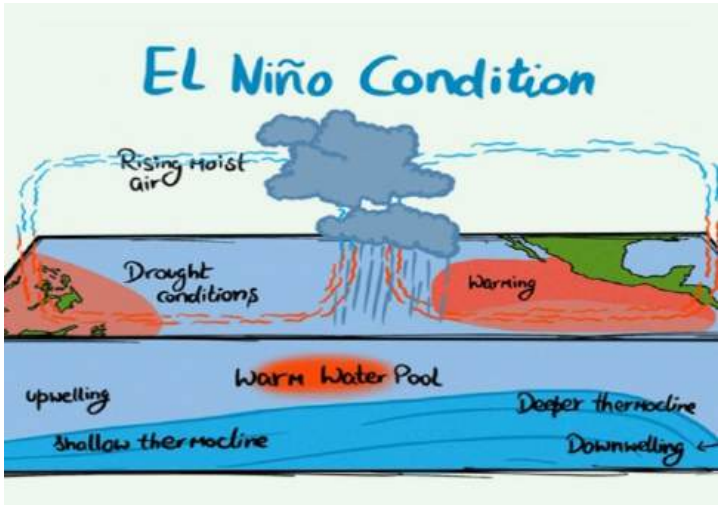
Significance:

- **Cultural Heritage:** Symbol of Inca civilisation's architectural and engineering mastery.
- **Tourism:** Peru's most economically vital tourist site; generates major foreign exchange.

EL NIÑO

Context:

A new study shows El Niño raises the probability of extreme daily rainfall across central India by nearly 50%, even though it suppresses overall monsoon rainfall, raising fresh concerns about flood hazards and climate resilience planning.



About El Niño:

What It Is?

- El Niño is the **warm phase of the El Niño–Southern Oscillation (ENSO)** phenomenon.
- It refers to the **unusual warming of sea surface temperatures** in the **central and eastern tropical Pacific Ocean**, disrupting global weather patterns.

How It Forms?

- Normally, **trade winds push warm water westward** towards Indonesia, allowing cold water upwelling off South America.
- During El Niño, **trade winds weaken**, warm water shifts eastwards, **deepening the thermocline** and suppressing nutrient-rich upwelling.
- This alters **Pacific jet streams** and global atmospheric circulation, creating weather anomalies worldwide.

Factors Favouring El Niño:

- **Weakening of easterly trade winds** (natural variability).
- **Positive sea surface temperature anomaly** (≥0.5 °C above normal for ≥5 consecutive overlapping 3-month seasons).
- Influence of **westerly wind bursts**, Madden–Julian Oscillation (MJO), and background **global warming** trends.

Key Features:

- **Periodic occurrence:** Every 2–7 years, irregular cycle.
- **Measured by ONI (Oceanic Niño Index)** using Sea Surface Temperature anomalies.
- **Global teleconnections:** Alters rainfall, storm tracks, fisheries, and temperature worldwide.
- Often accompanied by **droughts in Indonesia & Australia** and **floods in South America**.

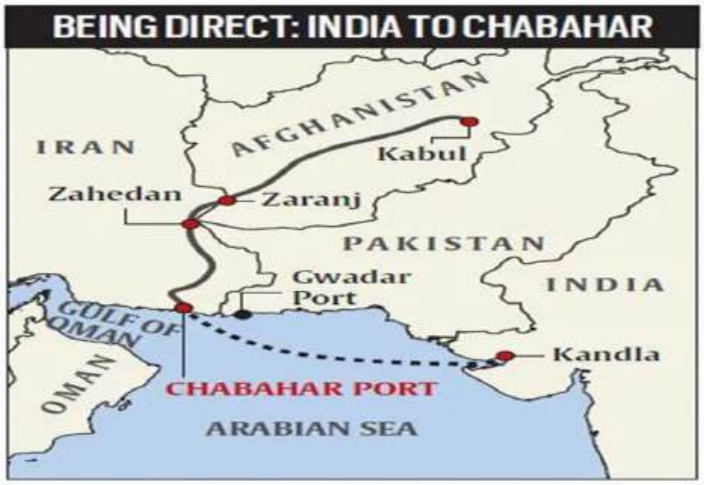
Impact on Indian Monsoon

- **Seasonal Rainfall:** Generally, **suppresses SW monsoon** → droughts more likely
- **Rainfall Distribution:** Reduces number of rainy

days, but **increases intensity of extreme rain events** in wetter regions (as per new study).
- **Monsoon Onset/Withdrawal:** Often causes **delayed onset** and erratic withdrawal.

CHABAHAR PORT

Context:
The United States has withdrawn the sanctions waiver for India's development of Iran's Chabahar Port, ending the 2018 carve-out under the Iran Freedom and Counter-Proliferation Act (IFCA).



About Chabahar Port:
- **What it is?**
  - Chabahar Port is Iran's only deepwater oceanic port, developed jointly by India and Iran. It is a key connectivity hub aimed at bypassing Pakistan to access Afghanistan, Central Asia, and Russia.
- **Location:**
  - Situated on the **Gulf of Oman**, in southeastern Iran's Sistan-Baluchestan province.
  - Roughly **170 km west of Gwadar Port** (Pakistan), which is developed by China under CPEC.
  - **Comprises two ports:** Shahid Beheshti (India's investment focus) and Shahid Kalantari.
- **History:**
  - **1973:** First proposed by the Shah of Iran.
  - **1983:** First phase opened during Iran-Iraq War to reduce reliance on Persian Gulf ports.
  - **2003:** India–Iran agreement to develop the port signed during President Khatami's visit.
  - **2016:** India, Iran, Afghanistan signed **Trilateral Agreement** to operationalize the port.
  - **2017:** Phase-I of Shahid Beheshti inaugurated; India sent its first wheat consignment to Afghanistan.
  - **2018:** India Ports Global Limited (IPGL) took partial charge of operations.
- **Aim:**
  - Provide India a **bypass route to Afghanistan and Central Asia**, avoiding Pakistan.
  - Anchor the **International North-South Transport Corridor (INSTC)** linking Indian Ocean to Russia & Europe.
  - Enhance Iran's trade connectivity despite Western sanctions.
- **Key Features:**
  - **Four-phase development plan** with ultimate capacity of **82 million tonnes/ year** and **32 jetties** (16 multipurpose, 10 containers, 3 oil, 3 dry bulk).
  - First phase currently handles **5.8 million tonnes capacity**.
  - Strategic location close to energy shipping lanes (Hormuz Strait).
  - Equipped to handle containers, bulk cargo, and cruise terminals.
- **Significance:**
  - **Strategic:** Counters China-Pakistan Gwadar Port axis, strengthens India's foothold in Indian Ocean.
  - **Economic:** Reduces transport cost/time to Central Asia, Russia, Europe via INSTC.
  - **Geopolitical:** Boosts India-Iran ties and gives New Delhi leverage in Afghanistan's reconstruction.

SUPER TYPHOON RAGASA

Context:
The Philippines has halted work and classes as Super Typhoon Ragasa barrels toward northern Luzon with winds up to 250 km/h.

About Super Typhoon Ragasa:
- **What It Is?**
  - A **Category 5 Super Typhoon** with sustained winds of 205 km/h and gusts up to 250 km/h.

- Locally called **"Nando"**, it is one of the strongest typhoons to hit the region in recent years.

- **Origin:**
  - Formed over the **western Pacific Ocean**, where warm waters and low wind shear created ideal conditions for intensification.
  - Moving across the **Luzon Strait**, expected to impact the Babuyan Islands before heading toward southern China.

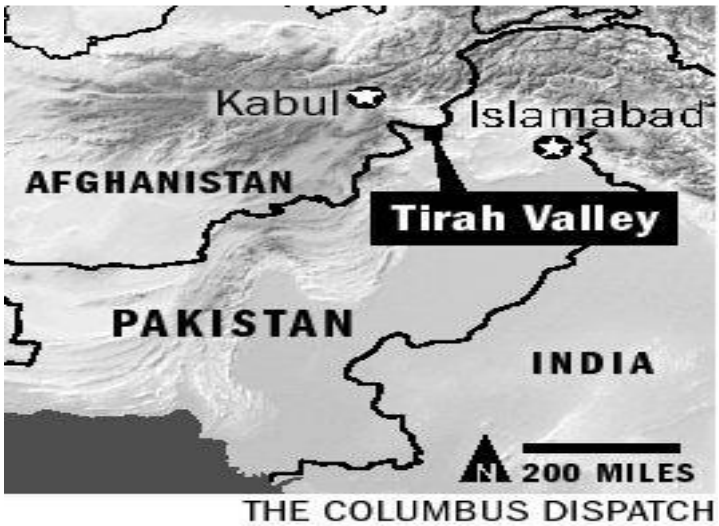
About the Philippines:

- **Location:**
  - **Archipelago nation** in Southeast Asia, western Pacific Ocean, consisting of **7,000+ islands**.
  - Lies about **800 km east of Vietnam**, forming part of the Pacific "Ring of Fire".
- **Capital:** Manila (political centre).
- **Neighbours:** All of its neighbors are separated by **sea channels or straits**:
  - **North:** Taiwan – across the **Luzon Strait**
  - **West:** Vietnam – across the **South China Sea**
  - **South:** Malaysia (Sabah, Borneo) and Indonesia – across **Sulu Sea, Celebes Sea**
- **Key Features:**
  - **Geography:** Three main island groups – Luzon (north), Visayas (central), Mindanao (south).
  - **Mountains & Volcanoes:** Includes active volcanoes like Mayon & Taal, prone to earthquakes and eruptions.
  - **Culture:** Mix of Asian and Western influences, one of only two Roman Catholic-majority nations in Asia.

TIRAH VALLEY

Context:

At least 23 people were killed in a blast in Pakistan's Tirah Valley (Khyber Pakhtunkhwa).



About Tirah Valley:

What it is?

- A **mountainous region and tribal stronghold** historically known for resistance to external control.
- Noted for fertile valleys, terraced agriculture, and as a hub of militant activity in recent decades.

Located in:

- Lies in Khyber District and Orakzai District of Khyber Pakhtunkhwa Province, Pakistan.
- Positioned between Khyber Pass and Khanki Valley.

Neighbouring Nations:

- Close to the **Afghanistan–Pakistan border**, making it strategically sensitive.
- Serves as a corridor between **South Asia and Central Asia**, historically contested by Mughals, British, and modern Pakistan.

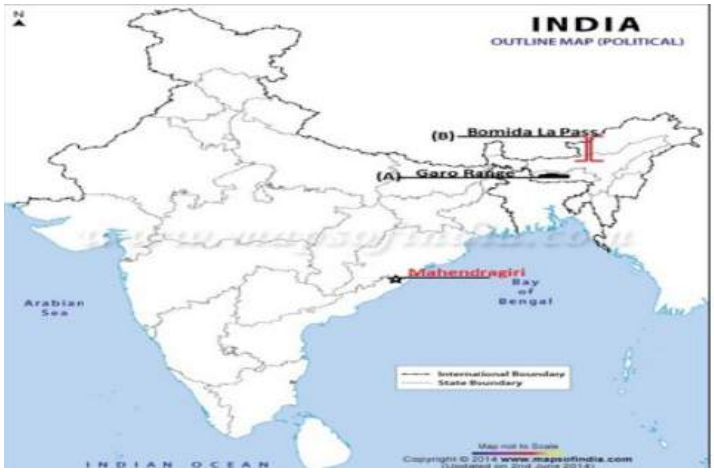
Features:

- **Geography:** About **600–700 sq miles**, with five main valleys – Maidan, Rajgul, Waran, Bara, and Mastura.
- **Terrain:** High passes (Sampagha, Tseri Kandao, Saran Sar), fertile alluvial soil, walnut and mulberry trees, summer pastures.
- **Population:** Predominantly **Pashtun tribes** – Afridis and Orakzais; with minority Sikh traders and Hamsaya communities.
- **History:** Site of the **1897 Tirah Campaign** by the British; frequent uprisings against Mughal and later Pakistani rule.

MAHENDRAGIRI HILLS

Context:

Environmentalists have raised concerns over unchecked tourism and construction projects in the ecologically fragile Mahendragiri hills of Odisha, threatening its biodiversity despite its Biodiversity Heritage Site status since 2022.



About Mahendragiri Hills:

What it is?

- A mountain range of the Eastern Ghats, revered for its mythological, cultural, and ecological

significance.
- Declared a Biodiversity Heritage Site in 2022 due to its rich flora and fauna.

Location:
- Situated in **Gajapati district, Odisha**, at an elevation of **1,501 meters (4,925 ft)**.
- About **175 km from Berhampur**, in the middle of the **Eastern Ghats**.

Features:
- **Biodiversity:** Home to **1,348 plant species** and **388 animal species**, many endemic and threatened.
- **Cultural heritage:** Known as *Mahendra Parvata* in Ramayana and Mahabharata; believed to be the site of **Lord Parashurama's penance**.
- **Temples:** Houses **Panchpandava temples** and shrines dedicated to Shiva, attracting thousands of pilgrims during **Maha Shivaratri**.
- **Tribal presence:** Inhabited by **Saora (Saura) and Kondh tribes**, dependent on the forests for livelihoods.
- **Scenic ecology:** A fragile mountain ecosystem prone to stress from deforestation, tourism pressure, and wildlife decline (e.g., elephants and tigers).

ESTONIA

Context:
NATO condemned Russia for violating Estonian airspace with three MiG-31 fighter jets.
- Estonia invoked Article 4 of NATO treaty to seek urgent consultations on territorial security.

About Estonia:
- Situated in **northeastern Europe**, northernmost of the **Baltic States**.
- **Capital:** Tallinn.
- **Neighbouring Nations:** Russia (via Narva River, Lake Peipus), Latvia, Baltic Sea.
- **Key Features:**
  - **Relief:** Mostly low-lying glacial plains, mean elevation ~50m.
  - **Highest Point:** Suur Munamägi (318m).
  - **Rivers:** Narva, Pärnu, Pedja, Kasari.
  - **Climate:** Temperate, humid and mild coasts due to North Atlantic air masses, colder inland.
- **Flora & Fauna:**
  - Forests cover ~50% land (pines, birches, firs).
  - **Rich biodiversity:** elk, deer, lynx, bears and migratory birds common.
- **NATO Articles:**
  - **Article 4:** Members consult whenever territorial integrity, political independence, or security is threatened.
  - **Article 5:** Collective defence clause – attack on one is considered an attack on all (invoked only once, post-9/11).
  - Estonia joined **NATO & EU in 2004**, ensuring security umbrella against external threats.

IUCN RECOGNISES DUGONG CONSERVATION RESERVE IN PALK BAY

Context:
The IUCN World Conservation Congress 2025 (Abu Dhabi) adopted a resolution recognising India's first Dugong Conservation Reserve in Palk Bay, Tamil Nadu as a global model for marine biodiversity conservation.

About IUCN Recognises Dugong Conservation Reserve in Palk Bay:

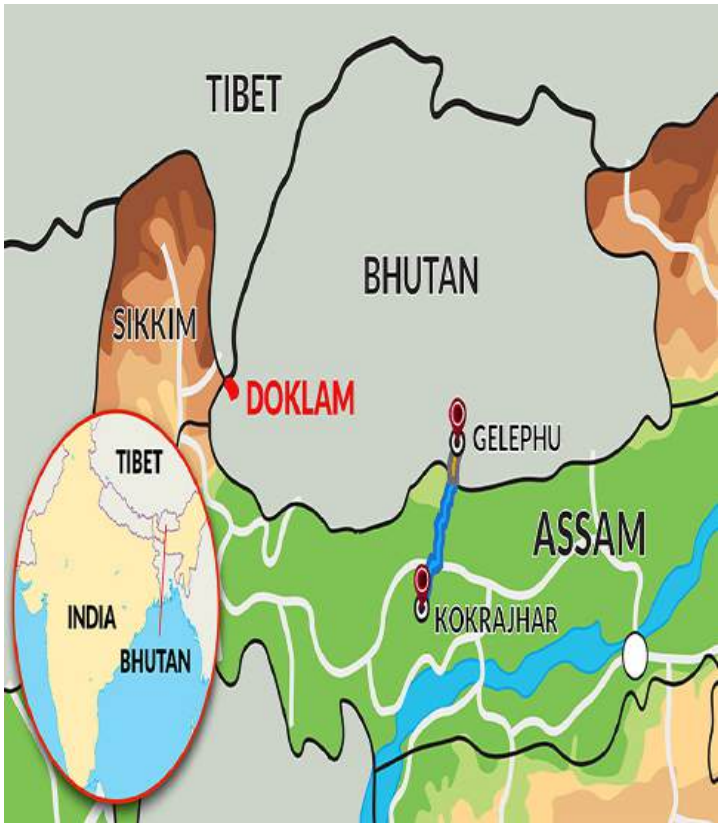
- **What it is?**
  - India's first Dugong Conservation Reserve, notified in September 2022 under the Wildlife Protection Act, 1972.
  - Recognised by IUCN in 2025 as a pioneering step for marine biodiversity and community-led conservation.
- **Located in:**
  - Covers **448.34 sq km** across **Thanjavur and Pudukkottai districts**, Tamil Nadu.
  - Situated in the **northern Palk Bay**, harbouring **12,250 hectares of seagrass meadows**.
- **Features:**
  - Protects **Dugong dugon (sea cows)**, listed as *Vulnerable* on the IUCN Red List.
  - Seagrass beds here also support **commercial fish, crabs, shrimps**, benefitting **marginal fishermen**.

About Dugong:

- **What it is?**
  - A large marine herbivorous mammal, commonly called "sea cow".
  - Only strictly herbivorous marine mammal in existence.
- **Scientific name:** *Dugong dugon*
- **Region found in:**
  - Distributed across **tropical and subtropical seagrass meadows** of the Indian Ocean and western Pacific.
  - In India → major populations in Palk Bay, Gulf of Mannar, Andaman & Nicobar Islands, and Gulf of Kutch.
- **Features:**
  - **Physical**:
    - **Size:** 3–3.5 m long, weight > 300 kg.
    - Paddle-like flippers, dolphin-like tail.
    - Grey-brown skin, rounded snout for grazing seagrass.
  - **Biological**:
    - **Diet:** Consumes **30–40 kg of seagrass daily** (species like *Halodule*, *Halophila*, *Cymodocea*).
    - **Lifespan:** Up to 70 years, but very low reproductive rate (long calving intervals).

KOKRAJHAR–GELEPHU SPECIAL RAILWAY PROJECT (SRP)

Context:
The proposed 69-km Kokrajhar–Gelephu rail line, India's first-ever railway link to Bhutan, has been declared a Special Railway Project (SRP) by the Indian Railways.



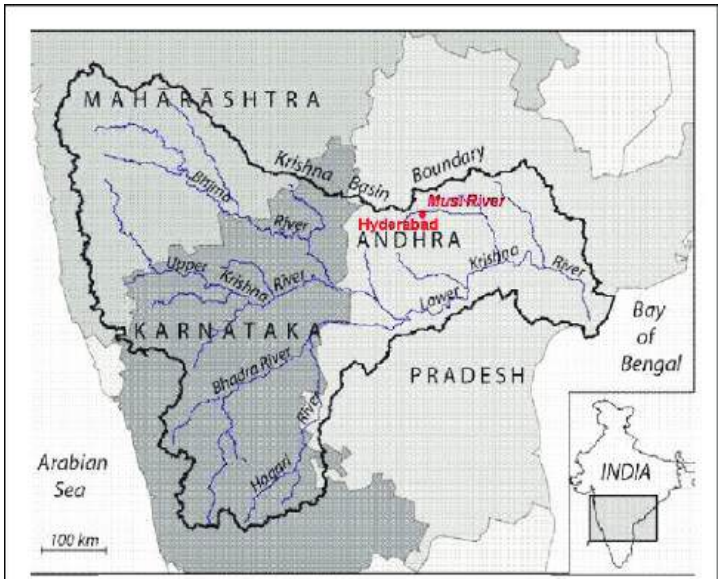
About Kokrajhar–Gelephu Special Railway Project (SRP):

- **What it is?**
  - A **cross-border railway project** connecting Kokrajhar in Assam (India) with Gelephu in Bhutan.
  - Aims to provide Bhutan its **first railway connectivity** and deepen bilateral ties.
- **Organisation involved:**
  - Implemented by the **Northeast Frontier Railway (NFR)** under the **Railways Act, 1989**.
  - Supported by the **Government of India** in alignment with the **Act East Policy**.
- **Aim:**
  - **Strategic importance:** Enhance cross-border connectivity with Bhutan.
  - **Economic growth:** Facilitate trade, tourism, and people-to-people contact.
  - **Security:** Strengthen India's frontier infrastructure in the Northeast.

- **Features:**
  - **Project cost:** Approx. **₹3,500 crore**.
  - **Stations:** Six new stations – Balajan, Garubhasa, Runikhata, Shantipur, Dadgiri, Gelephu.
  - **Road connectivity:** 1 Road Over Bridge and 39 Road Under Bridges.
  - **Viaducts:** Two viaducts of 11 metres each for safe passage across difficult terrain.
- **Significance:**
  - **First rail link for Bhutan:** Historic step in Bhutan's infrastructure development.
  - **Boost to Act East Policy:** Improves Northeast India's integration with South Asia.
  - **Regional trade hub:** Facilitates faster goods movement between India and Bhutan.

MUSI RIVER

Context:
Musi river in spate after heavy rains and water release from Osman Sagar & Himayat Sagar caused flooding in Hyderabad, submerging localities and bus stations.



About Musi River:

- **What it is?**
  - A major tributary of the Krishna River, also called Muchukunda or Musunuru River.
  - Passes through **Hyderabad**, dividing the **historic Old City** and the newer city.
- **Origin:** Originates from the **Ananthagiri Hills** near **Vikarabad, Telangana**.
- **Flow Through:**
  - Flows **eastward** across Telangana, turning **south at Chittaloor**.
  - Joins the **Krishna River at Vadapally**, near **Miryalaguda in Nalgonda district**.
- **Tributary of:** Krishna River (Deccan Plateau River system).
- **Features:**
  - **Reservoirs:** Forms **Osman Sagar** and **Himayat Sagar**—artificial lakes created as reservoirs to supply drinking water to **Hyderabad & Secunderabad**.
  - **Urban Role:** Runs through **Hyderabad city**, historically shaping its settlement pattern.
  - **Flood-Prone:** Vulnerable to heavy rains and sudden reservoir releases, as seen in recent floods.

VENEZUELA

Context:
Venezuelan President is preparing to declare a state of emergency in response to what he calls US "aggression," after American forces destroyed suspected Venezuelan drug boats and deployed warships near its coast

About Venezuela:

- **Located in:** Northern end of South America, occupying a triangular area larger than France and Germany combined.
- **Capital:** Caracas.
- **Border Nations:** Guyana, Brazil, Colombia, Caribbean Sea and Atlantic Ocean.

- **Key Features**:
  - **Physiographic Diversity:**
    - **Andes Mountains** – Includes **Bolívar Peak (4,978 m)**, highest in Venezuela.
    - **Orinoco River Basin & Llanos** – Core for agriculture, cattle ranching, hydro-power.
    - **Lake Maracaibo** – Largest Lake in South America; major **oil hub**.
    - **Guiana Highlands & Angel Falls** – Mineral-rich plateaus; **world's tallest waterfall (979 m)**.
  - **Natural Resources:**
    - World's largest proven oil reserves (economic backbone).
    - Rich in iron ore, gold, diamonds and hydroelectric potential.
  - **Strategic Location:**
    - Long **Caribbean coastline** with key islands (**Margarita, Los Roques, La Tortuga**).
    - Acts as a gateway between South America and the Caribbean/North America.