NITIN SIR
CLASSES

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NITIN SIR
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Current Affairs

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HISTORY & CULTURE

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
- 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.

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 is it?

- 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.

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 donate 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.

Sarnath

Context:

India has nominated Sarnath for the UNESCO World Heritage List (2025–26 cycle), aiming to secure global recognition for one of Buddhism's most sacred sites. A new plaque will also acknowledge Babu Jagat Singh (1787–88) for his role in its rediscovery, correcting earlier attributions to colonial-era officials.

Location:

- Situated about 10 km northeast of Varanasi, Uttar Pradesh.
- Lies at the confluence of cultural and spiritual heritage, making it a key Buddhist pilgrimage site.

Religious Significance:

- One of the four holiest Buddhist sites, along with:
- Lumbini (birth)
- Bodh Gaya (Enlightenment)
- Kushinagara (parinirvana)
- It is revered as the place where Gautama Buddha delivered his first sermon – the Dhammachakkappavattana Sutta, initiating the Buddhist Sangha.

Historical Background:

Ancient Names:

- Referred to as Mrigadava (Deer Park) and Rishipatana in Buddhist literature.

Ashokan Patronage (3rd century BCE):

- Emperor Ashoka visited and commemorated the site with:
- The Lion Capital Pillar (now India's National Emblem).
- Construction of monasteries and stupas.

Later Dynasties:

- The Kushana and Gupta periods (1st–6th century CE) saw expansion of monasteries, art, and sculpture, turning Sarnath into a vibrant learning and religious centre.
- Flourished until the 12th century CE.

Decline and Ruin:

- The site was sacked around 1193 CE, likely during Qutb-ud-din Aibak's invasion.
- Some suggest internal religious shifts and Islamic raids caused the downfall.
- Monasteries were abandoned; the area lay in ruins for over 700 years.

Modern Rediscovery:

- 1787–88: Jagat Singh's workers unearthed Buddha idols while collecting building material.
- 1799: Reported by Jonathan Duncan, sparking British interest.
- 1835–36: Alexander Cunningham identified the site as Sarnath.
- 1904–05: Friedrich Oertel's excavations recovered 476 artefacts and 41 inscriptions.

Key Structures & Attractions Today:

1. Dhamek Stupa

- Massive cylindrical structure marking the sermon site.

2. Ashokan Pillar & Lion Capital

- The Lion Capital is India's national emblem.
- Original fragments of the pillar remain near the site.

3. Sarnath Archaeological Museum

- Houses artefacts, sculptures, and inscriptions.
- Includes the iconic Seated Buddha in Dharmachakra Mudra.

UNESCO Nomination Importance:

- Recognises India's Buddhist heritage on a global platform.
- Could revive tourism, scholarship, and conservation efforts.
- Ends Sarnath's 27-year wait on the tentative UNESCO list.

Why it Matters:

- Sarnath blends religious, historical, and artistic value.
- It symbolises India's role in the spread of Buddhism to Asia.
- Restoration of Jagat Singh's contribution corrects historical narratives often dominated by colonial explorers.

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 the state's commitment to universal education.

Way Forward:

Judicial Rebalancing

- Larger benches 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.

Gender Imbalance in the Supreme Court of India

Context:

With the retirement of Justice Sudhanshu Dhulia in August 2025, only one woman judge (Justice B.V. Nagarathna) remains in the Supreme Court out of 34.

- The acute gender imbalance raises questions about diversity, representation, and inclusivity in India's top court.

About Gender Imbalance in the Supreme Court of India:

What it is?

- Gender imbalance refers to the gross under-representation of women judges in the Supreme Court, despite constitutional guarantees of equality (Articles 14, 15, 16).

Current Status:

- Since 1950, only 11 women judges (3.8%) out of 287 have been appointed.
- Presently, just 1 out of 34 judges is a woman.
- First woman judge: Justice Fathima Beevi (1989).
- Women judge often serve shorter tenures due to late appointments, limiting chances of rising to the Chief Justice position.

Causes of Gender Imbalance:

- Structural Barriers – Collegium system lacks institutionalised diversity criteria; gender not prioritised in appointments.
- Societal Factors – Gender stereotypes in the legal profession discourage women from leadership roles.
- Institutional Inertia – Late elevation of women judges limits tenure and prevents entry into the Collegium.
- Barriers from the Bar – Very few women Senior Advocates elevated directly to SC (only Justice Indu Malhotra so far).
- Opaque Processes – Collegium lacks transparency, making selection discretionary and exclusionary.

Challenges in Correcting Gender Imbalance:

- Opaque Collegium System – No written policy on diversity; reasons for appointments not disclosed consistently.
- Seniority & Tenure Limitations – Women are often elevated late, leaving them little time to serve in senior positions.
- Male-Dominated Legal Culture – Women face resistance in both High Courts and the Bar, limiting their pipeline to SC.
- Lack of Political & Institutional Will – Gender not treated as an "appointment criterion" unlike caste, region, or religion.
- Absence of Accountability – No mechanism to monitor or ensure gender diversity in higher judiciary.

Implications of Gender Imbalance:

On Judiciary:

- Narrow Perspectives – Lack of diverse viewpoints in judgments reduces inclusivity.
- Weaker Legitimacy – Undermines the Court's claim to represent all sections of society.

- Missed Jurisprudential Growth – Women's lived experiences enrich interpretation of rights (e.g., gender justice, workplace equality).
- Short Tenures = Limited Leadership – Late appointments deny women chances to serve as CJI or influence Collegium decisions.

On Society:

- Trust Deficit – Citizens may question judiciary's sincerity in advancing equality while failing to reflect it internally.
- Discouragement for Women Lawyers – Aspiring women see fewer role models at the highest level.
- Undermining Constitutional Morality – Violates the spirit of Articles 14 and 15 that promote substantive equality.
- Democratic Deficit – Judiciary fails to mirror India's gender diversity, weakening its representative legitimacy.

Way Forward:

Institutional Reforms

- Collegium resolutions must mandate gender diversity as a criterion.
- Transparent criteria for appointments with public disclosure of reasons.

Pipeline Development

- Greater appointments of women in High Courts.
- Encourage women from the Bar through structured mentorship and reservation in judicial services.

Policy & Ethical Anchoring

- Adopt a written diversity policy for higher judiciary (as suggested by 2nd ARC).
- Embed constitutional morality and substantive equality in judicial appointments.

Global Lessons

- Countries like Canada and the UK actively pursue diversity in top courts.
- India can adapt similar institutionalised approaches.

Conclusion:

The Supreme Court's credibility as the custodian of equality depends not just on its judgments but also on its own composition. Bridging the gender gap is not tokenism; it is an ethical imperative and a constitutional necessity. A judiciary that reflects the diversity of society will deepen public trust and make justice more inclusive.

Building Climate-Resilient Cities in India

Context:

India's urban population is expected to approach a billion by 2070, putting immense pressure on cities already vulnerable to climate-related threats such as floods, heatwaves, cyclones, and seismic events. This growing risk highlights the urgent need for cities to adopt climate-resilient planning and infrastructure.

Urban Challenges and Climate Threats:

- Flooding: Rapid urbanisation without proper drainage systems has left nearly two-thirds of city dwellers at risk. If left unaddressed, flood-related damages could exceed $30 billion by 2070.
- Rising Temperatures: Urban landscapes dominated by concrete and lacking green spaces trap heat, raising temperatures by 3–5°C above surrounding areas. This worsens health outcomes, increases death rates, and reduces productivity.
- Transport Issues: Many roads in Indian cities are susceptible to flooding. Even moderate rainfall can disrupt major transport networks, severely affecting mobility and daily functioning.
- Housing Concerns: A majority of future urban housing is yet to be constructed. Without climate-focused planning, these developments could embed vulnerabilities for decades.
- Inadequate Services: Weak systems for managing waste, drainage, and energy make cities more prone to climate shocks and less capable of effective response.

Why Resilient Cities Matter:

- Saving Lives: With more frequent and intense disasters, climate adaptation can help prevent loss of life and large-scale displacement.
- Economic Protection: Urban areas are economic engines, contributing significantly to national output. Resilient infrastructure keeps businesses running and jobs secure.
- Supporting the Vulnerable: Poor and marginalised groups often suffer the most in disasters. Inclusive city planning ensures better protection for these communities.
- Reducing Future Costs: Investing in resilience today helps avoid larger costs from disaster recovery and rebuilds in the future, while also attracting long-term investment.

Key Obstacles to Building Resilient Cities:

- Limited Capacity in Local Governments: Many urban local bodies lack skilled personnel, adequate funds, and technical resources to address climate risks effectively.
- Governance Gaps: Poor coordination and overlapping roles among various government agencies often delay critical climate actions.
- Financial Constraints: Cities often struggle with limited revenues and face hurdles in accessing international climate financing.
- Poor Land Use Planning: Construction on ecologically sensitive zones like wetlands and floodplains increases vulnerability to floods and disrupts natural ecosystems.
- Social Disparities: Low-income and informal settlements are usually located in the most disaster-prone areas, with limited protection or access to emergency services.

What India Has Done So Far:

- Climate Action Plans: National and state-level policies (NAPCC & SAPCCs) provide frameworks for adapting to climate challenges.
- Sustainable Habitat Mission: Focuses on eco-friendly urban development, including green buildings and low-carbon transportation systems.
- Smart Cities and AMRUT Missions: Aim to embed resilience into the core design and development of urban infrastructure.
- Heat Preparedness Plans: Beginning in Ahmedabad, several cities have introduced early warning systems, public cooling zones, and awareness campaigns to reduce the impacts of extreme heat.
- PMAY-Urban: Offers a chance to integrate climate-smart features into mass housing projects under the goal of "Housing for All."

Strategies to Build Climate-Resilient Cities:

- Smart Urban Planning: Encourage compact growth, avoid construction in high-risk zones, and enforce disaster-safe building regulations.
- Flood Risk Management: Invest in efficient drainage systems, restore natural wetlands, and implement technology-driven flood forecasting tools.
- Addressing Heat Stress: Increase urban greenery, promote reflective roofing, create shaded public spaces, and adjust working hours during extreme heat.
- Resilient Transport Networks: Construct elevated roads and diversify transport systems to maintain operations during climate emergencies.
- Strengthening Urban Services: Upgrade systems for waste management, water supply, and sanitation to withstand climate impacts and adopt circular economy practices.
- Financing and Collaboration: Explore options like green bonds, climate funds, and public-private partnerships, while involving citizens in local solutions.
- Skill Development and Data Use: Train municipal staff in climate planning, use GIS and AI tools for hazard mapping, and build institutional capacity at the local level.

Conclusion:

As Indian cities grow, their ability to adapt to climate threats will shape the country's future. Building resilience is not just about disaster preparedness — it's a foundation for sustainable economic growth, social justice, and environmental protection. With limited time to act, cities must move swiftly and decisively toward a climate-resilient future.

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 the 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.

130th Constitutional Amendment Bill: Accountability or Constitutional Overreach?

Context:

The 130th Constitutional Amendment Bill, 2025 proposes the automatic removal of Ministers, including the Prime Minister or Chief Ministers, if they are in custody for 30 consecutive days in cases involving offences punishable with five years or more.

What the Bill Proposes:

- Scope: Applies to Union, States, Delhi, and UTs (via separate amendments for J&K and Puducherry).

Ground for Removal:

- The individual must be in custody for 30 days.
- The offence must carry a punishment of ≥ 5 years.

Mechanism:

- Union Ministers: Removed by President on PM's advice.
- State Ministers: Removed by Governor on CM's advice.

- Delhi Ministers: Removed by President on CM's advice.
- PM/CM themselves: Must resign by the 31st day, failing which they cease to hold office.
- Reappointment Clause: No lifetime ban; reappointment is possible post-release.

Intended Objectives:

- Promote clean governance.
- Reinforce public trust in democratic institutions.
- Enhance constitutional morality and reduce criminalisation in politics.

Key Concerns & Criticism:

Violates Basic Structure Doctrine:

- Shifts power away from Parliament and courts, risking erosion of parliamentary democracy.
- Violates Kesavananda Bharati (1973) principle – Parliament cannot alter foundational features like rule of law and separation of powers.

Guilt by Custody:

- Equates pre-trial detention with guilt, violating due process and Article 21.
- Maneka Gandhi Case (1978): Emphasised that liberty can only be curtailed by a fair, just, and reasonable law.

Departure from Existing Legal Norms:

- Representation of People Act, 1951: Disqualifies MPs/MLAs only upon conviction, not mere arrest.
- A.R. Antulay (1988): Decried procedural shortcuts that bypass fair trial principles.

Disrupts Cabinet Collegiality:

- Ministers can be removed unilaterally based on PM/CM's advice, threatening the principle of collective responsibility.
- Contradicts S.R. Bommai (1994), which upheld Cabinet collegiality as a pillar of parliamentary democracy.

Tool for Political Targeting:

- Underlaws like PMLA, pre-trial custody can extend beyond 30 days.
- Investigative agencies (ED, CBI) may be used to target Opposition leaders, compromising political fairness.

Democratic Mandate Undermined:

- Elected representatives can be ousted without trial, bypassing voters' choice.
- May cause governance instability, especially in coalition or fragile governments.

Comparative Global Perspective:

Country	Approach
UK	Ministers are expected to resign on moral grounds, but there's no legal compulsion before conviction.
USA	Removals are driven by political pressure, not custody (e.g. Watergate). No formal pre-trial removal.
South Africa	Ministers are removed only after conviction or impeachment, preserving due process.

Potential Consequences:

- Frequent Cabinet Reshuffles → disrupt policy continuity.
- Judicial Overload → surge in litigation over arbitrary removals.
- Morality Politicised → parties could misuse the provision for short-term gains.
- Public Cynicism → accountability diluted if used selectively.

Way Forward: A Balanced Reform Approach

1. Link Removal to Charge Framing:

- Removal should be triggered after charges are framed by a court, not just on arrest.

2. Judicial Oversight:

- Any removal decision must undergo review by the High Court within 7 days.

Protect Cabinet Principle:

- Ensure collective Cabinet advice, not just unilateral action by the PM or CM.

3. Neutral Mechanism:

- Consider an independent Ethics Commission or Lokpal to assess such cases.

Promote Moral Accountability:

- Encourage voluntary resignations based on moral conscience (e.g., Lal Bahadur Shastri, 1956) instead of mandatory disqualifications.

Conclusion:

The 130th Amendment seeks to strengthen integrity in governance but does so through procedural shortcuts that may violate the Constitution's basic structure. Equating custody with culpability risks undermining due process, federal principles, and democratic choice.

True reform must be anchored in judicial safeguards, institutional neutrality, and respect for liberty—only then can accountability and democracy coexist without one destroying the other.

Geotagging of Buildings in Census

Context:

The 2027 Census of India will, for the first time, include geotagging of all buildings during the Houselisting Operations.

What is Geotagging?

- Geotagging assigns latitude and longitude coordinates to each building.

These coordinates are mapped on a Geographic Information System (GIS), giving each structure a precise digital identity.

Implementation Details:

- To be conducted during the Houselisting Operations (HLO), 2026, the first phase of Census 2027.
- Enumerators will use smartphones with a dedicated Census mobile app and enabled GPS to mark every building digitally.
- Buildings will be classified as residential, non-residential, mixed use, or landmarks.
- Data on houses and households will be collected simultaneously.

Key Features:

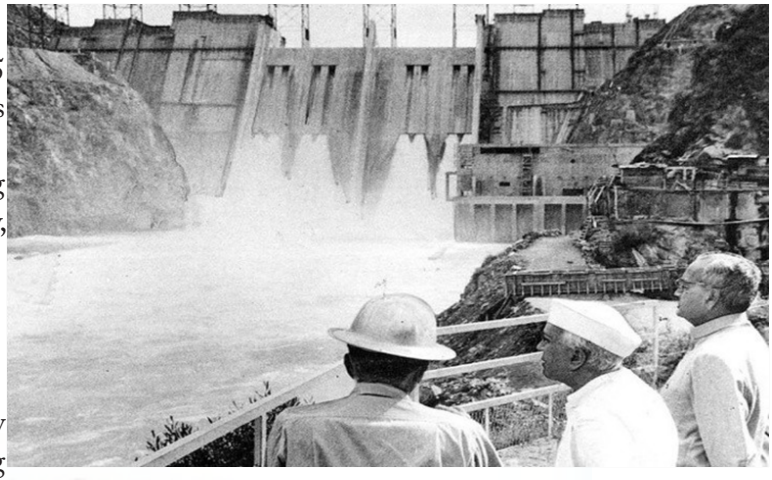
- Replaces traditional hand-drawn sketch maps with Digital Layout Mapping (DLM).
- Unlike SECC 2011 (where tablets were provided), enumerators will use their own smartphones.
- Geotagged data will integrate with other Census datasets such as population and socio-economic profiles.

Significance:

- Accuracy: Minimizes errors like duplication or omission of houses.
- Efficiency: Facilitates better workload management for over 34 lakh enumerators.
- Policy Impact: Enables targeted delivery of welfare schemes related to housing, urban planning, and rural development.
- Transparency: Provides verifiable, geospatial data to improve governance and planning.

Ageing Dams in India

Context:



India faces an ageing dam challenge — over 1,065 dams are 50–100 years old and 224 are 100+ years old (2023 data).

- Experts warn that many dams are nearing the end of their design life, raising safety, irrigation, and hydropower

About Ageing Dams in India:

History of Dams in India:

- Pre-Independence: Kallanai (2nd century CE) is one of the world's oldest functioning dams, built for irrigation; Mettur (1934) and Nizam Sagar (1931) were among the earliest large modern reservoirs.
- Colonial Era: British built Krishna and Godavari anicuts to boost canal irrigation; conceptualised Damodar Valley Corporation on the Tennessee Valley model.
- Post-Independence Era: Bhakra-Nangal (1963), Hirakud (1957), Rihand, Tungabhadra and Koyna dams symbolised Nehru's "temples of modern India," fueling Green Revolution.
- 1951–1971 Expansion: India started work on 418 large dams in two decades, marking a massive nation-building push for irrigation, power, and flood control.
- Modern Era: Shift to multipurpose projects integrating irrigation, power, tourism, navigation, and inland fisheries for holistic water resource development.
- Current Phase: Focus on rehabilitation, modernization, and climate resilience to extend lifespan and ensure safety of ageing infrastructure.

Laws & Policies for Dams in India:

- Dam Safety Act, 2021: Provides a legal framework for dam surveillance, operation, and maintenance; establishes NDSA, National Committee on Dam Safety, and State Dam Safety Organisations (SDSOs).
- Mandatory Inspections: Requires pre- and post-monsoon inspections, Emergency Action Plans, and inundation maps to prevent disasters and ensure preparedness.
- Dam Rehabilitation and Improvement Project (DRIP I–III): Covers 736 dams across 19 States with World Bank & AIIB funding for structural strengthening, gate replacement, monitoring equipment, and staff training.
- Central Water Commission (CWC) Guidelines: Issue technical protocols for periodic safety reviews, risk assessment, and remedial action to maintain dam health.
- No Formal Decommissioning Policy: India currently focuses on extending lifespan; lacks a structured framework to safely retire obsolete or unsafe dams.

Challenges to Dams in India:

Ageing Infrastructure:

- Over 4,200 dams will cross the 50-year mark by 2050, raising risks of structural fatigue and safety lapses.
- Old spillway designs are inadequate to handle present-day floods, increasing overtopping risk.

Sedimentation & Loss of Capacity:

- Bhakra, Hirakud, and Lower Bhavani lost 20–30% storage due to siltation.
- Reduced live storage hits irrigation potential, hydro generation, and drinking water supply.

Climate Change & Extreme Events:

- Cloudbursts, GLOFs (Sikkim 2023), and intense monsoons strain ageing dams.
- Flood routing capacities often lag behind probable maximum flood estimates.

Seismic & Geotechnical Risks:

- Dams like Mullaperiyar & Koyna lie in seismically active zones; cracks & seepage are recurring concerns.
- Foundation erosion and piping threaten earth-fill dams' stability.

Institutional & Governance Gaps:

- Inadequate data transparency and limited citizen participation.
- Absence of decommissioning policy and slow implementation of rehabilitation projects.

Case Studies:

- Mullaperiyar Dam (1895): 120+ years old, inter-state safety dispute between Kerala & TN, seismic vulnerability flagged by experts.
- Hirakud Dam (1957): Lost 25% capacity and near-overtopping in 1982 prompted auxiliary spillway creation.
- Bhakra Nangal (1963): Sedimentation reduced reservoir capacity by 23%; seismic reanalysis underway.
- Tiware Dam Failure (2019): Breach killed 19 people and highlighted need for robust inspection regime.

Way Forward:

Risk-Based Prioritisation

- Focus on high-consequence dams first (downstream population, economic value).
- Independent third-party safety audits.

Strengthening Infrastructure

- Retrofit spillways, reinforce structures per latest seismic & climate standards.
- Catchment area treatment to slow silt inflow.

Decommissioning & Repurposing

- Develop formal policy for safe decommissioning when risk > benefit.
- Explore alternate water storage systems (aquifer recharge, check dams).

Community Engagement & Transparency

- Downstream hazard mapping, public warning systems, mock drills.
- Open-access dam safety database for citizen oversight.

Climate-Resilient Design

- Incorporate probable maximum flood (PMF), GLOF risk, glacial retreat modelling in dam management plans.

Conclusion:

India's dams are both lifelines and liabilities as they age. A science-based, risk-informed, and climate-resilient approach to dam management is vital. Long-term sustainability lies not just in preserving dams, but in prioritizing safety, minimizing risks, and ensuring intergenerational water security.

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.

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.

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 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.

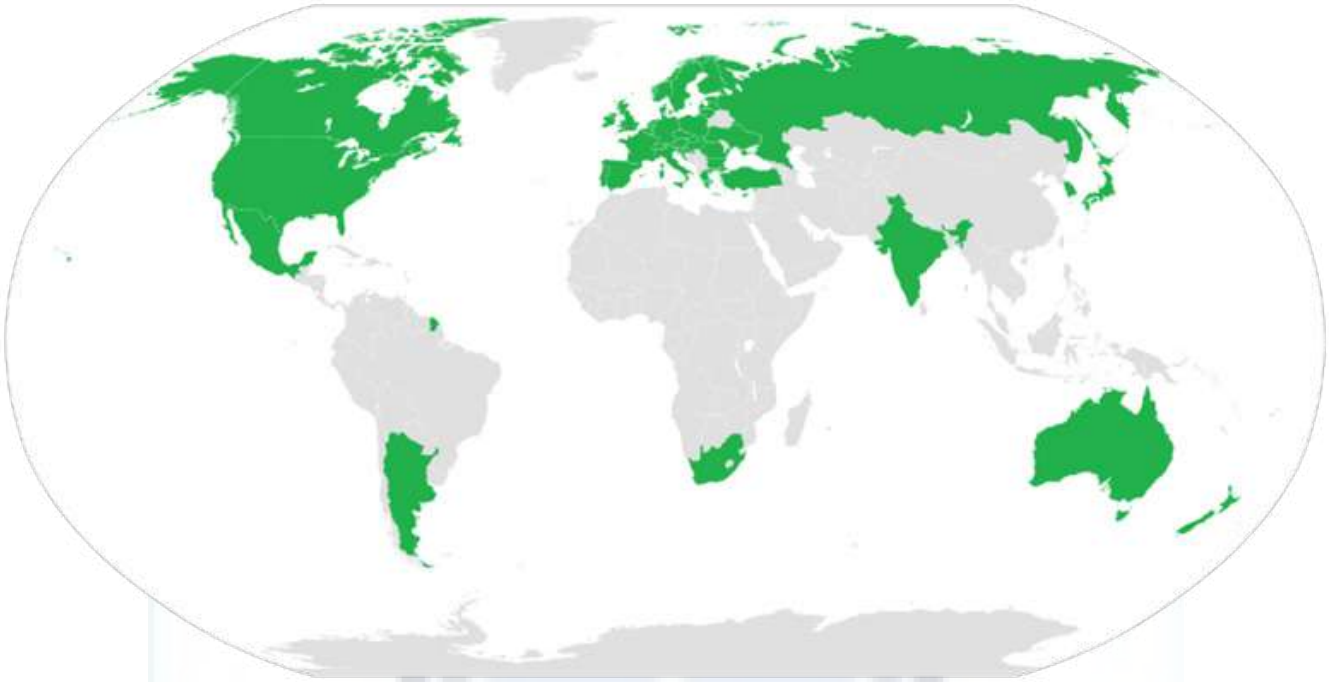
Key Provisions:

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.

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 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.

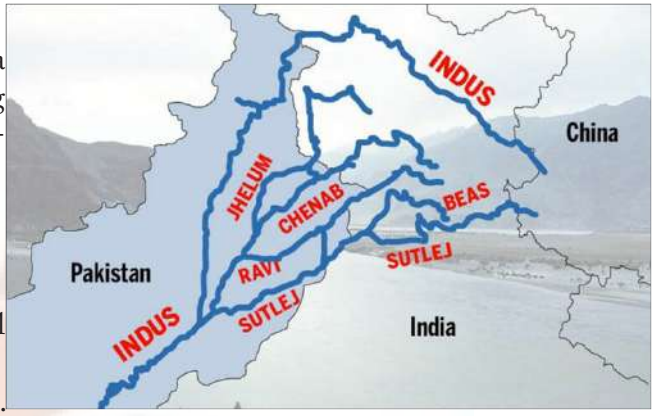
Key Features:

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."

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.

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.

Nilgiri Tea

Context:

Tea growers in the Nilgiris region of Tamil Nadu are facing a prolonged pricing crisis, driven by falling rates for green tea leaves, oversupply, and inefficiencies in the auction system. This situation is putting pressure on small-scale farmers and threatening the long-term sustainability of the local tea industry.

What is Nilgiri Tea?

- Nilgiri tea comes from the Camellia sinensis var. sinensis plant, cultivated in the Nilgiri Hills of Tamil Nadu.
- It is famous for its aromatic, brisk, and full-bodied liquor, making it popular in both domestic and international markets.
- The tea is often found in iced teas, masala chai, and is a component in blends used by well-known global brands.

Region of Cultivation:

- Primary Area: Nilgiris district in Tamil Nadu.
- Other Areas: Grown to a lesser extent in parts of Kerala and Karnataka.
- Recognised as a Geographical Indication (GI) product since 2008, marking its unique regional identity and quality.

Distinct Features of Nilgiri Tea:

- Offers both orthodox teas (rolled leaves) and CTC (crush-tear-curl) varieties.
- Has a light yet robust flavour, with citrusy and floral notes.
- Retains its clarity and taste even when cooled, making it ideal for iced tea blends.
- Commonly used in commercial products by brands like Nestea.

Favourable Growing Conditions:

- Altitude: Grown at heights between 1,000 to 2,500 metres in the Western Ghats.
- Climate: Benefits from both southwest and northeast monsoons, along with alternating fog, sunlight, and rain—ideal for high-quality tea.
- Soil: Grows best in lateritic loam, a rich and well-drained soil type.
- Harvest Cycle: Tea is plucked frequently—up to 32 times a year. The first harvest after winter dormancy, called frost tea, is especially prized for its distinct flavour.

Challenges Facing the Nilgiri Tea Industry:

1. Price Crisis:

- The market price of green tea leaves (GTL) is often lower than the production cost, pushing small growers into financial distress.

2. Overproduction:

- There are too many processing factories relative to the quantity of tea produced, resulting in lower quality output and intense competition.

3. Market Dependence:

- Heavy reliance in the past on exports to the former USSR and Russia without adequate market diversification has created vulnerability.

4. Auction System Issues:

- Auctions suffer from price manipulation, pre-arranged deals, and inefficient price discovery, failing to offer fair value to growers.

5. Quality Concerns:

- Some tea batches face problems like adulteration and inconsistent standards, affecting reputation and demand.

6. Rising Costs:

- The cost of labour and agricultural inputs is increasing, putting additional pressure on small-scale producers who already earn low returns.

Conclusion:

Nilgiri tea, with its unique flavour and heritage, is a key agricultural product of southern India. However, small growers now face significant economic and structural hurdles. Without policy intervention, improved auction mechanisms, and better price realisation, the future of this GI-tagged tea industry remains uncertain.

Himalayan Fragility and Unsustainable Development

Context:

Recent floods and landslides in Punjab, Himachal Pradesh, Uttarakhand, and Kashmir have highlighted the consequences of rampant construction, deforestation, and unregulated development in the fragile Himalayan region. Experts and the Supreme Court have warned that such unsustainable growth is pushing the Himalayas toward ecological collapse.

About the Himalayas

Geography:

- The Himalayas are the youngest and highest fold mountains globally, stretching ~2,400 km across India, Nepal, Bhutan, China, and Pakistan.
- Average width: 150–400 km; average elevation over 6,000 meters.
- Home to the world's tallest peaks, including Mount Everest (8,849 m) and Kanchenjunga (8,586 m).
- They form a natural, climatic, ecological, and cultural boundary for the Indian subcontinent.

Formation:

- Originated from the collision between the northward-moving Indian Plate and the Eurasian Plate about 50 million years ago.
- This ongoing collision causes the Himalayas to rise approximately 5 mm annually.
- The region was once the Tethys Sea, where sediments accumulated before uplift.

Fragility of the Himalayas

- Young and Unstable: Being geologically young, the Himalayas are prone to earthquakes, landslides, and soil erosion.
- Climate Sensitive: Higher warming rates lead to accelerated glacier melt and unpredictable rainfall.

- High-Energy Landscape: Steep slopes and fast rivers intensify disaster risks like floods and landslides.
- Glacial Lakes: Presence of over 25,000 glacial lakes increases the risk of sudden Glacial Lake Outburst Floods (GLOFs).
- Biodiversity Hotspot: Unique ecosystems are vulnerable, affecting local livelihoods.

Causes of Himalayan Degradation

- Unregulated Infrastructure: Construction of roads, tunnels, and hydroelectric projects destabilize fragile slopes.
- Deforestation: Removal of native trees (like deodar) for tourism and urbanization weakens soil stability.
- Hydropower Projects: Excessive damming disrupts natural river systems and raises flood risks.
- Weak Environmental Oversight: Environmental Impact Assessments (EIA) are often bypassed or compromised.
- Tourism Pressure: Growing infrastructure demands accelerate land degradation.

Consequences

- Human Tragedies: Catastrophic events like the 2013 Kedarnath flood and 2021 Chamoli disaster caused significant loss of life and displacement.
- Ecological Damage: Forest loss, soil erosion, and declining biodiversity reduce the region's resilience.
- Disaster Amplification: Poorly planned development turns heavy rains into devastating floods and landslides.
- Economic Loss: Damage to infrastructure and agriculture hurts state economies and tourism.
- Social Distrust: Communities lose faith in governance due to unsafe development practices.

Way Forward

- Mountain-Specific Development Policies: Incorporate carrying capacity and ecological sensitivity in planning.
- Strengthen EIAs: Mandate rigorous, independent environmental and disaster impact assessments.
- Nature-Based Solutions: Promote afforestation, slope stabilization, and watershed management.
- Community Participation: Empower local governance, enhance climate literacy, and promote eco-tourism.
- Diversify Energy Sources: Reduce reliance on hydropower; encourage solar, wind, and decentralized energy systems.

Conclusion

The Himalayas are at a critical juncture where unchecked development and climate change threaten their stability and the lives dependent on them. Sustainable, ecologically sensitive, and community-driven development is vital to preserving these "living mountains" for future generations.

Great Nicobar Island Project

Context:

The Government of India has approved the Great Nicobar Island Project, a major multi-sector development plan aimed at enhancing India's strategic and economic presence in the Indian Ocean Region.

What is the Project?

A large-scale integrated development initiative to transform Great Nicobar Island into a logistics, trade, and defence hub. Designed with environmental safeguards and tribal welfare protections under EIA Notification 2006 and the Shompen Policy 2015.

Key Components:

- International Container Transhipment Terminal (ICTT): Capacity of 14.2 million TEU to reduce India's dependence on Colombo and Singapore ports, establishing the island as a global shipping hub.
- Greenfield International Airport:To improve air connectivity, boost tourism, and facilitate rapid military deployment.
- 450 MVA Gas + Solar Power Plant: Ensures reliable energy supply using a mix of fossil fuel and renewable sources.
- Integrated Township: Spread over 16,610 hectares, providing housing and modern amenities for residents and workers.
- Phased Development (2025–2047): Spread over three phases to manage ecological impact and adapt plans over time.

Strategic & Economic Importance:

- Location: Near the Malacca Strait, a critical global shipping route, enhancing India's maritime surveillance and naval power projection.
- Blue Economy: Supports Sagarmala and Maritime India Vision 2030 to boost India's shipping and transhipment capabilities in the Indo-Pacific.
- Defence: Strengthens the Andaman & Nicobar Command (India's only tri-service command) for maritime security.
- Trade Efficiency: Expected to reduce transhipment costs by $200–300 million annually.
- Employment & Local Development: Creates direct and indirect jobs, promotes skill development and eco-tourism-based livelihoods.

Challenges:

- Ecological Sensitivity: Impact on forests, endemic species, and nesting grounds of leatherback turtles.
- Tribal Welfare: Ensuring protection of Shompen and Nicobarese PVTGs without displacement.
- Disaster Risk: High seismicity and vulnerability to tsunamis and cyclones require resilient infrastructure.
- Logistics: Remote location increases costs and supply chain complexity.
- Global Scrutiny: Environmental concerns and biodiversity impacts may invite international criticism.

Way Forward:

- Strengthen Environmental Impact Assessment (EIA) monitoring with satellite data and independent audits.
- Engage tribal communities in planning and livelihood through eco-tourism, mangrove restoration, and crafts.
- Promote green infrastructure—solar/wind energy, rainwater harvesting, low-carbon buildings.
- Incorporate disaster-resilient planning (early warnings, cyclone shelters).
- Leverage strategic partnerships with Quad, BIMSTEC, and SAGAR partners for investment and maritime security cooperation.

Conclusion:

The Great Nicobar Island Project is crucial for India's strategic and economic aspirations in the Indo-Pacific. Balanced implementation respecting ecology and tribal rights can make it a model for sustainable island development while enhancing India's regional influence.

India Targets 2028 for Swadeshi Solar Cells

Context:

India has set a target to build a fully indigenous solar manufacturing ecosystem by 2028, covering the entire supply chain—from modules to cells, wafers, and ingots.

What is the Plan?

- A national roadmap to achieve end-to-end "Swadeshi" solar manufacturing.
- Led by the Ministry of New and Renewable Energy (MNRE).
- Supported by Production-Linked Incentive (PLI) schemes, policy reforms, and reduced GST.

Objectives:

- Reduce Import Dependence: Especially on China for solar cells, wafers, and modules.
- Energy Security: Control supply chains for a reliable energy future.
- Boost Make in India: Establish India as a global solar manufacturing hub.
- Job Creation: Both in core manufacturing and ancillary industries.
- Attract Investment: Leverage 24,000 crore PLI + FDI in renewables.

Key Features & Progress:

Parameter	Status
Solar Module Capacity	100 GW (achieved), expansion underway
PLI Scheme	50,000 crore investment attracted, 12,600+ direct jobs created
Surya Ghar Muft Bijli Yojana	2 million households benefited; 50% report 0 electricity bills
PM-KUSUM Scheme	1.6 million solar pumps installed; 1.3 billion litres of diesel saved
GST Cut	Reduced from 12% to 5% on solar equipment
Ease of Doing Business	Single-window clearances, fast-track land allotment

Significance:

- Energy Transition: Supports India's 2030 target of 500 GW non-fossil capacity.
- Strategic Autonomy: Reduces overdependence on foreign tech and pricing shocks.
- Green Economy: Boosts circular economy and sustainable industrialisation.
- Employment: Massive job potential in both rural and urban India.

Challenges Ahead:

- High capital cost for upstream manufacturing (wafer/ingot).
- Technology gap with global leaders.
- Need to develop ancillary ecosystems (glass, backsheets, EVA films).
- Global competition & WTO scrutiny on protectionist policies.

Way Forward:

- R&D in solar PV, storage, and hybrid systems.
- Incentivise joint ventures and tech transfers.
- Strengthen grid infrastructure for solar integration.
- Focus on quality control and certification to compete globally.

Conclusion:

India's 2028 "Swadeshi Solar" goal is key to energy sovereignty, climate leadership, and industrial growth. If executed effectively, it can make India not just Atmanirbhar in solar, but a net exporter of clean energy technology.

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.

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.
- Behavioral 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.

Grey Rhino Event

Context:

The devastating landslide in Wayanad, Kerala (July 2024), has been termed a grey rhino event, underlining how repeated warnings about the region's ecological vulnerability and extreme rainfall were overlooked.

What is a Grey Rhino Event?

A grey rhino refers to a highly likely, high-impact threat that is clearly visible and foreseeable, yet often ignored until it causes major damage.

It stands in contrast to a black swan event, which is rare and unpredictable. Grey rhinos are obvious dangers, hiding in plain sight.

Key Characteristics:

Feature	Description
Predictable	Risks are well-known and repeatedly flagged.
Visible	Early warning signs are clear and measurable.
Neglected	Authorities or institutions fail to act, often due to inertia, competing interests, or short-term priorities.
High Impact	Leads to severe consequences across society, economy, and environment.
Actionable	Can be prevented or mitigated through early intervention and policy action.

Why It Matters:

- Risk Awareness: Encourages governments and planners to focus on obvious but ignored threats like deforestation, unstable slopes, poor drainage, etc.
- Disaster Management: Highlights the importance of proactive governance, zoning regulations, and early warning systems.
- Sustainability: Supports eco-sensitive planning and strengthens climate resilience in vulnerable regions.

Relevance to Wayanad Landslide:

- The area was already marked as geologically fragile.
- Rainfall forecasts and slope instability were publicly known.
- Lack of enforcement of zoning and building norms contributed to the disaster.
- The event showcases systemic neglect of known ecological risks, making it a textbook example of a grey rhino.

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.

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.

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.

Chapter-
5

SCIENCE & TECHNOLOGY

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.

First Overseas Atal Innovation Centre

Context:

In September 2025, India's first overseas Atal Innovation Centre was inaugurated by the Union Education Minister at the IIT Delhi–Abu Dhabi campus during his UAE visit.

About the Overseas Atal Innovation Centre

What it is:

A premier innovation hub established outside India under the Atal Innovation Mission (AIM) framework.

Location:

IIT Delhi–Abu Dhabi campus, UAE.

Objectives:

- Promote innovation, research, and entrepreneurship among students and young professionals.
- Strengthen India–UAE collaboration in education, sustainability, and technology-driven solutions.

Functions:

- Incubation and mentoring of start-ups.
- Provide infrastructure and labs for cutting-edge research.
- Facilitate joint student exchanges, teacher training, and skill development.
- Serve as a bridge for global knowledge-sharing and innovation networks.

About Atal Innovation Mission (AIM)

Nature:

A flagship Government of India initiative, implemented by NITI Aayog, to foster a culture of innovation and entrepreneurship across the country.

Key Components:

Atal Tinkering Labs (ATLs):

Over 10,000 labs in schools for students (Class 6–12) to learn robotics, IoT, 3D printing, electronics, etc.

Atal Incubation Centres (AICs):

72 incubators supporting 3500+ start-ups and creating 32,000+ jobs.

Sector Focus:

HealthTech, FinTech, AgriTech, EdTech, Food Processing, Drone & Space Tech, AR/VR, etc.

- Support for over 1,000 women-led start-ups.

Significance:

- Marks India's first international expansion of AIM, showcasing global outreach of India's innovation ecosystem.
- Deepens educational and technological collaboration between India and the UAE.
- Provides Indian and UAE students access to a world-class innovation ecosystem, fostering entrepreneurship and sustainable solutions.

ISRO Signed 100th Technology Transfer Agreement with HAL for SSLV Production

Context:

ISRO has signed its 100th technology transfer agreement, this time with Hindustan Aeronautics Limited (HAL), empowering HAL to independently produce Small Satellite Launch Vehicles (SSLVs).

About Small Satellite Launch Vehicle (SSLV):

What is SSLV?

A 3-stage, cost-effective launch vehicle designed specifically to deploy small satellites rapidly and economically.

Configuration:

- Three solid propulsion stages.
- A terminal liquid-based Velocity Trimming Module (VTM) for precise orbit insertion.
- Developed by:Indian Space Research Organisation (ISRO).
- Objective:To meet growing global demand for small satellite launches with quick turnaround and minimal infrastructure.

Specifications:

- Height: Approximately 34 meters (about 11 storeys).
- Diameter: About 2 meters.

- Liftoff weight: ~120 tonnes.
- Payload capacity: Up to 500 kg to a 500 km orbit.

Propulsion Details:

- First, Second, and Third stages: Solid-fueled engines.
- Final stage (VTM): Small liquid-fuel engines (MMH + MON-3) with 16 thrusters for precise orbit correction.

Capabilities:

- Can launch single or multiple satellites simultaneously.
- Designed for nanosatellites, microsatellites, and minisatellites (10–500 kg).
- Offers flexible, low-cost, and quick launch options to domestic and international customers.

Significance of Technology Transfer to HAL:

- Atmanirbharta (Self-reliance): HAL can now manufacture SSLVs independently.
- Boost to Industrial Ecosystem: Expands participation of public and private Indian industry in space technology.
- Global Competitiveness: Strengthens India's position in the international small satellite launch market.
- Milestone: Marks ISRO's 100th successful technology transfer, highlighting its role in tech dissemination.

NASA Discovers Potential Biosignatures on Mars

Context:

NASA's Perseverance rover has discovered the strongest potential biosignatures on Mars in a sample named Cheyava Falls, located in Sapphire Canyon.

What is Sapphire Canyon?

- Rocky outcrop near Neretva Vallis river valley in Jezero Crater, Mars.
- Named by NASA's Perseverance rover science team.
- Features Cheyava Falls, where the sample was drilled in July 2024.

Cheyava Falls Sample:

Contains:

- Clay, silt, organic carbon, iron oxides, sulphur, phosphate
- White calcium sulfate veins → evidence of ancient water flow

Shows:

- "Leopard spot" textures and black mottling (likely formed by water-rock interactions)
- Signs of organic molecules & electron-transfer reactions

Analysed using:

- SHERLOC (Scanning Habitable Environments with Raman & Luminescence)
- PIXL (Planetary Instrument for X-ray Lithochemistry)

What are Biosignatures?

- Definition: Any substance, structure, or pattern that indicates past or present life.
- Includes organic molecules, microbial textures, redox gradients, etc.
- This is closest evidence yet for ancient microbial life on Mars.

Significance:

- Boosts hope of extraterrestrial life discovery.
- Strengthens need for Mars Sample Return Mission.
- Advances astrobiology and our understanding of early Earth-like conditions.

Light-Based (Optical) Computers

What Are They?

Computers that use photons (light) instead of electrons to process and transmit data.

- Developed by: Tampere University (Finland) + Université Marie et Louis Pasteur (France)
- Breakthrough: Achieved AI image recognition using light pulses in fibre optics.

How It Works:

1. Convert data into a light pulse (e.g., image).
2. Send the pulse through non-linear optical fibre.
3. Light undergoes changes (spectrum/fingerprint) → acts like a neural network.
4. Decode light at the end to get the AI output (e.g., number identification).

Key Features:

Feature	Optical Computers
Speed	Light travels faster than electricity
Efficiency	Low power use, minimal heat generation
Parallelism	Multiple wavelengths (colours) = simultaneous data
AI Accuracy	~91–93% in image recognition tasks
Scalability	Increases with fibre length & light strength

Applications:

- AI & ML: Accelerate neural network training, edge computing
- Supercomputing: Efficient simulations (weather, genomics)
- Telecom: Faster data transfer, low-latency networks
- Defence & Space: Real-time satellite image processing
- Quantum Computing: Potential synergy with light-based quantum systems

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.

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.

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.

Meta Display Smart Glasses:

Context:

Meta has unveiled its first-ever Ray-Ban smart glasses featuring an integrated Augmented Reality (AR) display, marking a major leap in wearable technology.

What Are They?

These are AR-enabled eyeglasses that project digital content—such as text, images, or video—onto the lens, allowing users to view virtual information overlaid on the real world. This is the first widely available AR eyewear with a built-in display since the era of Google Glass.

How They Work:

- Micro Display: A small screen projects content onto the inside of the right lens, positioned just below the user's line of sight.
- Sensors & Cameras: Capture the user's environment to support contextual AR experiences.
- Processors: Power the device, handling real-time rendering of digital overlays.
- Connectivity: Bluetooth connects the glasses to a smartphone for data, calls, and app integration.
- Controls: Operated via touch-sensitive arms, voice commands, and a neural wristband that detects subtle finger movements.

Key Features:

- Heads-Up Display (HUD): Shows real-time text, images, directions, and translations without needing to check a phone.
- AI Chatbot: Offers smart answers to voice queries, with visual responses embedded in the display.
- Live Translations: Real-time captions and language translation for conversations.
- Hands-Free Capture: Allows users to take photos and videos and share them directly via messaging apps and social media.
- Battery Life: Up to 6 hours of active usage and 30 hours with the charging case.
- Privacy Indicator: An LED light alerts others when the camera is recording.

Real-World Applications:

- Navigation: Provides turn-by-turn walking directions and real-time landmark information.

- Communication: Enables live translated conversations and video calls with hands-free convenience.
- Education & Training: Offers visual learning through AR overlays in professional or academic settings.
- Workplace Use: Supports remote assistance and on-site problem-solving in industries like manufacturing or field services.
- Fitness Integration: Real-time data tracking (pace, heart rate) through pairing with wearables like Garmin.
- Entertainment: Offers immersive experiences such as AR games or watching content on a virtual screen.

Limitations & Challenges:

- Limited Battery: Frequent charging required for extended use.
- Privacy Concerns: Public use of the camera can raise ethical and surveillance questions.
- Connectivity Dependency: Functions optimally only when connected to a smartphone and internet.
- Distraction Risk: Potential to divert attention in sensitive situations like driving or crossing roads.

Significance:

This innovation pushes the boundary of wearable tech, combining artificial intelligence, AR, and connectivity in a single device. It has the potential to redefine how people interact with digital content in everyday life but also raises new questions around ethics, usage norms, and digital well-being.

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 it 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.

AI-enabled Centre at Betla National Park

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.

Artificial Intelligence and India's Global Race

Context:

India is emerging as a key player in the global Artificial Intelligence (AI) landscape, with growing applications across sectors like healthcare, agriculture, education, and finance. However, the country faces challenges in research depth, infrastructure, regulation, and global competitiveness.

India's Current AI Position:

- Government Backing: The India AI Mission has been launched with a budget exceeding 10,000 crore to build compute power, research ecosystems, and AI-based services.
- Digital Strength: India boasts over 1 billion smartphone users and records 20 billion+ monthly UPI transactions — a strong base for AI integration.
- Global Standing: While India shows potential, countries like the US and China lead with investments over $20–30 billion, indicating India's funding and innovation gap.
- Human Capital: With a massive tech workforce and AI being introduced in school education, India has quantity but still lacks high-quality AI researchers.

AI Opportunities in India:

1. Healthcare

- AI can assist in cancer diagnostics, rural telemedicine, and epidemic forecasting.
- Personalised treatment models using patient data are becoming possible.

2. Education

- Projects like Bhashini provide real-time translation for classrooms and government use.
- AI-driven ed-tech can offer adaptive learning in regional languages.

3. Agriculture

- Precision farming tools and satellite-based advisory systems improve crop planning.
- AI aids in drought prediction, pest control, and disaster preparedness.

4. Financial Services

- Rural banking gets a boost through AI-powered tools like "Hello UPI".
- Fraud detection and alternative credit scoring help improve financial access.

5. Disaster Management

- States like Odisha use AI for early cyclone warnings.
- AI-based geospatial tools help manage floods, landslides, and forest fires.

Challenges in India's AI Ecosystem:

Infrastructure Deficit

- Lack of timely access to GPUs and limited data centre capacity.
- Inadequate high-performance computing facilities at national scale.

Weak R&D Output

- India contributes less than 2% to global AI research.
- Scarcity of advanced AI doctoral programmes and innovation hubs.

Regulation & Ethics

- The outdated IT Act (2000) still governs digital technologies.
- Rising concerns over privacy, algorithmic bias, misinformation, and mental health.

Talent Shortfall

- Rapid growth of short-term courses has created shallow skillsets.
- Shortage of expert faculty and researchers slows foundational learning.

Geopolitical Lag

- Global AI leadership is dominated by the US, EU, and China.
- Without breakthroughs in foundational models (like LLMs), India risks remaining a user, not a creator.

Way Forward:

1. Strengthen Research

- Boost funding for core AI research in universities and national labs.
- Create incentives for private sector innovation and patent filing.

2. Skilling & Education

- Integrate deep AI learning across universities, not just elite institutions.
- Train educators and invest in long-term fellowships and PhDs.

3. Policy & Regulation

- Enact a modern Digital India Act with AI-specific provisions.
- Define ethical principles for AI based on transparency, safety, and accountability.

4. Public–Private Collaboration

- Set up AI innovation clusters in health, agriculture, and green tech.
- Encourage startups and MSMEs to adopt AI through subsidies and incubation.

5. Global Cooperation

- Engage with global research platforms and AI alliances.
- Use platforms like G20, BRICS, and Quad to shape AI standards and governance.

Conclusion:

AI offers transformative potential for India's socio-economic development. While digital readiness and human capital are India's strengths, challenges in research, ethics, and strategic investment remain. To lead in the AI era, India must shift from being a consumer to a creator—combining innovation with responsibility and inclusive growth.

India's Fusion Energy Roadmap

Context:

Researchers at the Institute for Plasma Research (IPR), Gandhinagar, unveiled a roadmap for India's fusion energy programme.

- It proposes developing SST-Bharat, a superconducting tokamak aiming for a demonstration reactor by 2060.

About India's Fusion Energy Roadmap:

What is Nuclear Fusion?

- Fusion vs. Fission: Unlike fission (splitting heavy atoms), fusion joins light nuclei (e.g., isotopes of hydrogen) to form heavier atoms, releasing massive energy.

Advantages:

- Minimal radioactive waste compared to fission.
- Abundant fuel (deuterium from water, tritium from lithium).
- No greenhouse gas emissions.
- Inherent safety — no meltdown risk.

India's Fusion Power Plans:

1. Current Research Base:

- SST-1 Tokamak (IPR, Gandhinagar): Research reactor, plasma duration up to 650 ms.
- Participation in ITER (France): India contributes technology and funding to the world's largest magnetic confinement experiment.

2. Roadmap Highlights:

- SST-Bharat: A fusion-fission hybrid reactor, producing ~130 MW (100 MW fission, 30 MW fusion) at estimated cost 25,000 crore.
- Demonstration Reactor (by 2060): 250 MW output, with Q=20 (20x more power output than input).

Innovations Proposed:

- Digital twinning for plasma simulation.
- Machine learning-assisted plasma confinement.
- Development of radiation-resistant materials.

3. International Benchmarks:

- UK STEP programme: Prototype by 2040.
- US Start-ups: Grid-connected fusion targeted by 2030s.
- China's EAST tokamak: World record in plasma duration.
- France WEST Tokamak: Maintained plasma for 22 minutes (2025).

Key Features of India's Fusion Strategy:

- Magnetic confinement using tokamaks: India relies on tokamak reactors, which use powerful magnetic fields to confine plasma at ultra-high temperatures, mimicking stellar conditions for fusion.
- Focus on steady-state superconducting technology: Superconducting magnets enable continuous plasma confinement with minimal energy loss, ensuring stability and efficiency in long-duration operations.
- Fusion-fission hybrid as a bridge to pure fusion: The proposed SST-Bharat will combine fission and fusion, generating partial power from fusion while using fission as a stabilising backup source.
- State-led R&D with limited private-sector involvement: Most funding and projects are led by the Institute for Plasma Research and Department of Atomic Energy, unlike the US and Europe where start-ups drive progress.
- Alignment with Net Zero 2070 energy roadmap: Fusion research is part of India's long-term clean energy strategy, complementing solar, wind, and fission to reduce dependence on fossil fuels.

Challenges Ahead:

Technological:

- Sustaining high-temperature plasma for longer durations.
- Achieving Q>1 consistently (ITER aims for 10, India targets 20).
- Developing durable superconducting magnets and radiation-resistant materials.

Financial:

- SST-Bharat alone costs 25,000 crore.
- Competes with cheaper renewables (solar, wind).
- Lack of private investment unlike US/Europe.

Policy & Governance:

- No clear legislative or regulatory framework for fusion.
- India's energy priorities currently lean on solar, wind, and nuclear fission.

Global Competition:

- Western and Chinese projects target earlier timelines (2030s–40s).
- India's 2060 target risks technological lag.

Economic Viability:

- Fusion electricity affordability remains unproven.
- Potential cost overruns and long gestation periods.

Way Forward:

- R&D Boost: Increase funding for plasma physics, superconductors, and AI-based simulations.
- Public-Private Partnerships: Encourage Indian start-ups to enter fusion R&D.
- International Cooperation: Deepen engagement with ITER, collaborate with UK STEP, US start-ups, and China's EAST programme.
- Policy Framework: Create a National Fusion Energy Mission under NITI Aayog/Department of Atomic Energy.
- Skill Development: Train engineers, physicists, and technicians in fusion sciences.
- Strategic Value: Use spin-off technologies (superconducting magnets, radiation-resistant alloys) to upgrade India's defence, space, and industrial sectors.

Conclusion:

India's fusion roadmap balances ambition with fiscal caution, aiming for a 2060 prototype. Even if commercial fusion is distant, spin-offs in superconductivity, plasma modelling, and materials science will strengthen technology. This ensures India emerges as a co-creator, not just a consumer, in the future energy revolution.

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).

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.

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.

Rationalising Tariffs for a Competitive India

Context:

- The US recently imposed 50% tariffs on Indian goods.

- India is labelled a "Tariff King" due to high average import duties.
- Raises debate on how tariffs impact competitiveness, trade, and growth.

India's Tariff Landscape:

Metric	Status
Simple Avg. Tariff (G20)	2nd highest (16.2%) – after Turkey
Agricultural Tariffs	Highest globally – 64.3% (trade-weighted)
Non-Agricultural Tariffs	9.2% (above EU, China)
Tariff Dispersion	Highly irrational (e.g. cotton = 0%, food prep = 150%)
Impact on Trade Talks	Hurdle in India-UK FTA, EU BTIA

Why Rationalise Tariffs?

1. Economic Efficiency

- Promotes competitiveness & innovation (e.g. post-1991 auto sector success).
- Reduces production costs for MSMEs.

2. Consumer Welfare

- Lower prices for essentials (edible oils, electronics, fertilizers).
- Helps fight inflation and improve nutritional security.

3. Global Integration

- Encourages entry into Global Value Chains (GVCs).
- Attracts FDI, boosts "China + 1" strategy.

4. Trade Diplomacy

- Builds credibility in WTO, FTAs.
- Prevents retaliatory duties (like recent US tariffs).

5. Innovation & R&D

- Competitive pressure pushes firms towards better tech, productivity.
- Challenges in Tariff Rationalisation:

Challenge	Details
Farmer Protests	Fear of import-led price crashes (esp. dairy, pulses, sugar).
Revenue Loss	Customs duties form a sizeable part of government revenue.
MSME Fear	Vulnerable to cheap imports without productivity upgrades.
Infrastructure Gaps	Poor cold chains, logistics weaken competitiveness.
Political Economy	Lobby resistance (e.g. poultry, dairy) to tariff cuts.

Suggested Reforms:

1. Tiered Tariff Structure

Item Type	Suggested Duty
Raw Materials	0–10%
Non-sensitive goods	10–20%
Sensitive goods	20–35%
Luxury goods	35–50%

- Use Tariff Rate Quotas (TRQs) to allow limited imports at lower rates.

2. Agriculture Reform

- Increase agri-R&D to 1% of Agri-GDP (vs current ~0.3%).
- Promote precision farming, micro-irrigation, and value chains.
- Reform fertiliser subsidy – shift to DBT (Direct Benefit Transfer).

3. Logistics & Infrastructure

- Invest in cold chains, storage to cut 15–20% post-harvest losses.
- Strengthen Farmer Producer Organisations (FPOs).

4. Simplify Tariff Code

- Align tariff logic with GST: clear, uniform, and digital.
- Implement paperless customs, faceless assessments.

Conclusion:

"Imports are not threats but tools of growth."
India must transition from being a "Tariff Maharaja" to a globally competitive economy.

- Rationalising tariffs will:
- Enhance competitiveness,
- Empower farmers through productivity,
- Benefit consumers,
- Improve trade ties.

By aligning with comparative advantage (Ricardo's theory) and embracing open, strategic trade, India can become self-reliant yet globally integrated.

Indian Dairy Sector

Context:

Recent trade negotiations between India and the U.S. have hit a roadblock, as India maintains its position against opening its dairy sector to foreign imports, citing risks to rural livelihoods and national self-sufficiency.
Overview of India's Dairy Sector

Transformation Journey:

India transitioned from a milk-deficient country to the world's largest milk producer, primarily due to Operation Flood (1970–1996). Today, it contributes nearly one-fourth of global milk production.

Current Production (2024–25):

- Milk Output: ~248 million metric tonnes
- Consumption: ~243 million metric tonnes
- Self-Sufficient: Surplus production ensures domestic demand is met.

Sector Composition:

- 80 million+ smallholders are involved.
- Average herd size: 3–4 animals per farmer.
- Milk yield per cow is just 1/8th that of developed countries like the U.S. or New Zealand.
- 70% of milk is marketed through the unorganised sector.

Importance of the Dairy Sector in India

Top Contributor to Agri-GDP:

- Accounts for 31% of agricultural GDP, ahead of traditional crops.

Rural Livelihood Security:

- Provides stable income, especially for women and landless households.

Nutritional Support:

- Essential source of affordable protein and micronutrients for a largely vegetarian population.

Employment Generator:

- One of the largest rural employment providers after crop farming.

Socio-Economic Equaliser:

- Helps reduce rural poverty by enabling income for marginalised communities.

Why India Resists Liberalising Dairy Trade

Protecting Farmers:

- Lower tariffs could lead to cheap imports, harming domestic prices and driving smallholders out.

Maintaining Self-Sufficiency:

- Dependency on foreign dairy products risks future supply disruptions and price volatility.

Preventing Rural Unrest:

- Sudden policy shifts could destabilise rural livelihoods, sparking protests.

Infant Industry Concern:

- India's dairy sector lacks economies of scale and is not ready to compete with global giants.

Political Sensitivity:

- Cooperatives like Amul, Nandini, and Verka are deeply embedded in regional politics.

India's Dairy Sector in Global Trade Context

Export Potential:

- Indian dairy exports have surged, with major buyers being Bangladesh and the UAE.

Global Pressure:

- U.S., EU, and NZ have surplus production and see India as a large, untapped market.

Trade Negotiation Deadlock:

- Dairy access remains a major hurdle in Free Trade Agreements with Western nations.

MNC Competition:

- Foreign giants can undercut Indian producers due to better productivity and scale.

Key Challenges

Challenge	Description
Low Productivity	Indian cows produce far less milk compared to global averages.
Inadequate Feed & Housing	Poor-quality diets and unsanitary sheds reduce milk output.
Breeding Limitations	Weak adoption of artificial insemination and low genetic yield.
Cold Chain Gaps	Majority of milk is handled informally, leading to spoilage and low margins.
Underinvestment	Dairy gets just 4% of the agri-budget despite its large contribution.

Reform Agenda for a Stronger Dairy Ecosystem

Productivity Boost

- Promote high-quality feed, region-specific breeds, and animal supplements.
- Scale up use of IVF and sex-sorted semen to improve yield and reduce infertility.

Infrastructure Development

- Establish dairy parks, chilling units, and encourage mechanised milking.
- Support Farmer Producer Organisations (FPOs) for aggregation and better market access.

Policy & Financial Support

- Align budget allocation with the sector's contribution to agriculture.
- Expand insurance and credit access for small dairy farmers.

Value Addition & Export Focus

- Increase processing capacity for cheese, butter, whey, and organic dairy.
- Build global demand for Indian dairy under unique tags like A2 milk.

Farmer Orientation

- Help farmers treat dairy as a main income activity, not just a side business.
- Invest in training and extension services to upgrade dairy knowledge and practices.

Conclusion

India's dairy sector is a lifeline for millions and a cornerstone of rural resilience. While global trade integration is important, it must not come at the cost of farmer livelihoods or self-sufficiency. With smart investments, innovation, and farmer empowerment, India can build a globally competitive yet locally rooted dairy ecosystem.

GST 2.0

Context:

The Government rolled out GST 2.0 from September 22, 2025, termed the "GST Bachat Utsav" by the 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 is it?

- 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 the 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 the 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.

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 the 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:

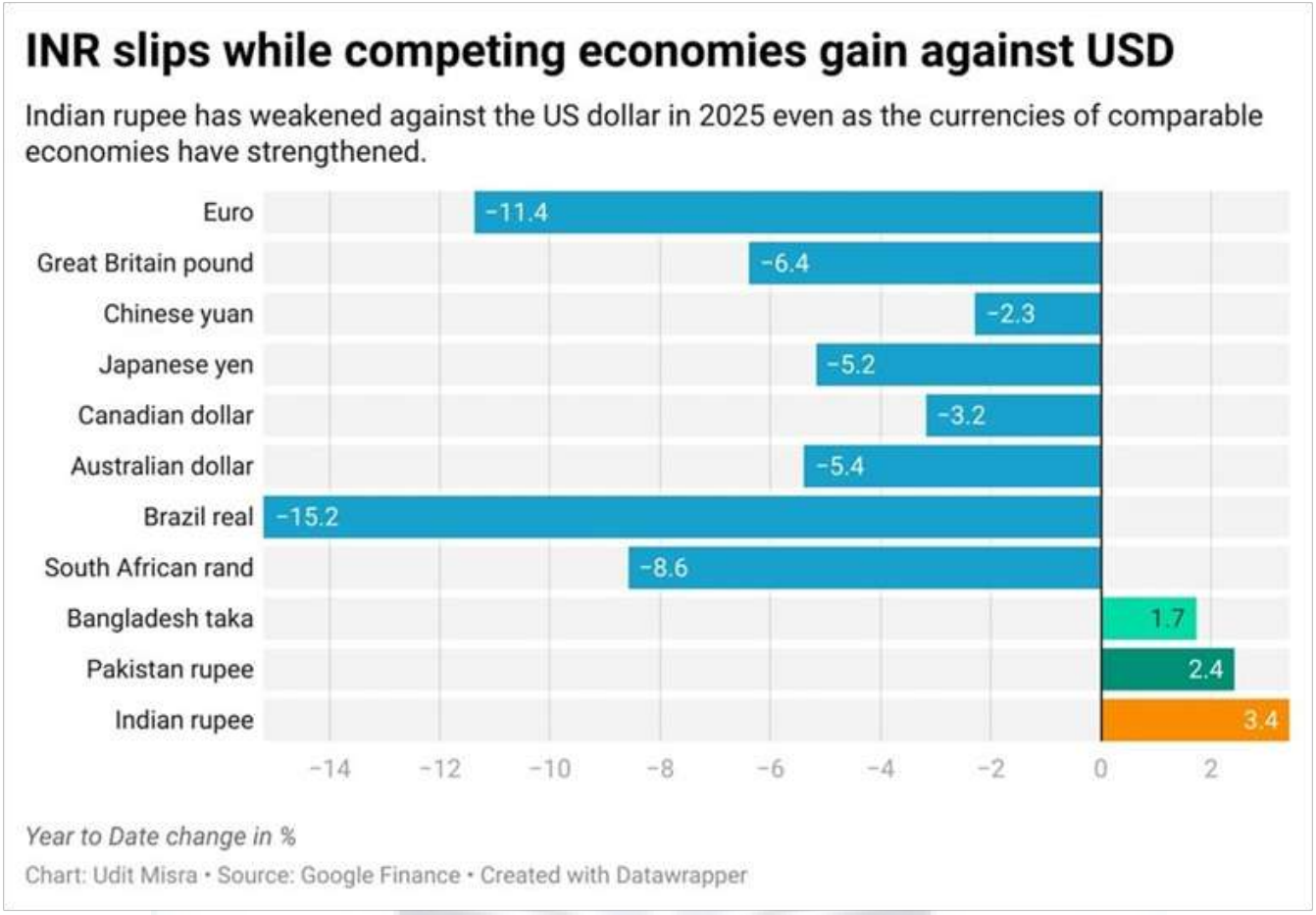
The Indian Rupee's recent weakness against the dollar stems from a persistent trade imbalance and sluggish investment inflows, compounded by global financial tightening.

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 de-dollarisation 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.

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 the Sun's surface).
- Located in the 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).

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.

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.

Two New Species of Aspergillus section Nigri from the Western Ghats

Context:

Scientists at the MACS–Agharkar Research Institute (Pune), under the Department of Science & Technology (DST), have discovered two new species of black fungi (Aspergillus section Nigri) in the Western Ghats, highlighting the region's rich fungal biodiversity.

About Aspergillus Section Nigri

- Commonly known as black aspergilli, these fungi are widespread in soil and plants.
- Industrially significant for their role in producing citric acid, fermentation processes, and applications in food and agriculture.
- Referred to as "workhorses of biotechnology" due to their versatile commercial uses.

Newly Discovered Species

1. Aspergillus dhakephalkarii

- Rapid growth with brown spores and orange sclerotia (resting structures).
- Spores are smooth and oval-shaped, differing from the rough or spiny spores of related species.

2. Aspergillus patriciawiltshireae

- Also fast-growing with abundant sclerotia.
- Spores are spiny with branching structures forming multiple columns.
- Additionally, two species, A. aculeatinus and A. brunneoviolaceus, were reported for the first time in India.

Significance

- Confirms the Western Ghats as a hotspot for hidden fungal diversity.
- Potentially benefits biotechnology, industrial fermentation, citric acid production, and agriculture (soil nutrient cycling).
- Enhances India's role in fungal taxonomy, ecology, and biotech research.

Samudra Pradakshina: World's First Tri-Service All-Women Sailing Circumnavigation

Context:

What is it?

- Samudra Pradakshina is India's first-ever tri-service all-women circumnavigation sailing expedition.
- Involves sailing around the globe, meeting global norms of true circumnavigation (as per World Sailing Speed Record Council).
- Flagged off: September 2025, Gateway of India, Mumbai
- Duration: Sept 2025 – May 2026 (~8 months)
- Distance: ~26,000 nautical miles

Vessel & Route Details

- Vessel: IASV Triveni, a 50-foot indigenous Class A yacht, built in Puducherry.

Route:

- Easterly circumnavigation
- Crosses Equator twice
- Rounds major Capes: Leeuwin (Australia), Horn (South America), Good Hope (Africa)

Crew Composition

- 10 women officers from the Army, Navy, and Air Force

Led by:

- Lt Col Anuja Varudkar (Indian Army)
- Sqn Ldr Shraddha P Raju (Indian Air Force)

Aims & Objectives

- Nari Shakti: Celebrate courage, endurance, and leadership of women in uniform.
- Tri-service Integration: Strengthen jointness and interoperability among armed forces.

Science & Research:

- Partnering with National Institute of Oceanography (NIO)
- Study microplastics, ocean biodiversity, and marine health.
- Strategic & Diplomatic Outreach:
- Use port calls to promote military diplomacy and cultural engagement.

Historical Context

Name	Achievement	Year
Capt. Dilip Donde	1st Indian to solo circumnavigate the globe	2009–10
Cmde. Abhilash Tomy	1st non-stop Indian circumnavigation	2012–13
INSV Tarini – Navika Sagar Parikrama I	All-women Navy team circumnavigation	2017–18
Navika Sagar Parikrama II	Second Navy-led women expedition	2024–25

Significance

- Women Empowerment: First global tri-service, women-led maritime expedition—milestone in gender inclusion in Indian defence.
- Aatmanirbhar Bharat: Showcases indigenous shipbuilding, sailing, and maritime R&D capabilities.
- Blue Economy & Maritime Vision: Aligns with India's SAGAR policy (Security and Growth for All in the Region).
- Strategic Messaging: Demonstrates India's maritime strength, expeditionary capabilities, and global presence.

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.

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.

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.

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.

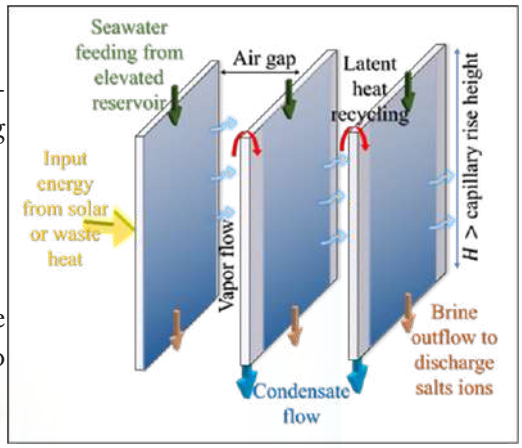
Significance:

- 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.

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/m^2/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).

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).

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.

Chapter-
8

INTERNATIONAL RELATION

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.

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 is it?

- 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.

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.
- The power of Siberia 2 is big, but still much smaller than Europe's old demand.

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:

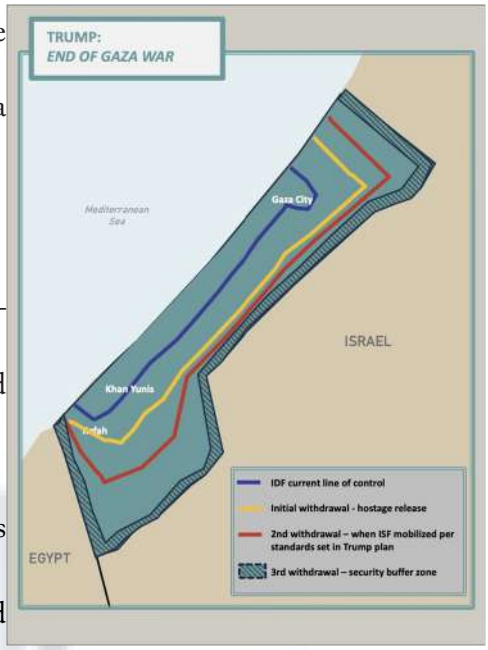
India–Mauritius relations are evolving from a traditional partnership to a comprehensive, future-ready strategic alliance. With health, education, infrastructure, and maritime cooperation forming the core, this partnership embodies the Neighbourhood First policy in action.

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.

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.

9 DISASTER MANAGEMENT

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.

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.

Chapter-
10

SOCIAL ISSUES

Ageing and Health Burden in India

Context:

India is facing a growing challenge with its ageing population, especially in terms of healthcare. As more people enter their senior years, issues like multiple health conditions, low insurance coverage, and financial insecurity are becoming increasingly significant.

Current Situation:

India had around 149 million people aged 60 and above in 2022. This number is expected to more than double, reaching approximately 347 million by 2050—making up over 20% of the population. This shift brings a dual burden for the elderly:

- Health-related: Older individuals often suffer from several chronic illnesses simultaneously, such as diabetes, high blood pressure, heart conditions, joint problems, and strokes.
- Financial-related: With reduced earnings and weak social security systems, many seniors face economic hardship, especially when medical expenses are high.
- Out-of-pocket health spending is alarmingly high, with nearly half of the total healthcare expenses being paid directly by individuals. This often leads to people borrowing money or selling assets to afford treatment.

Main Health Issues Faced by the Elderly:

- Outpatient Care: Many seniors frequently visit doctors for ongoing issues like pain, fever, diabetes, breathing problems, and heart conditions—most of which are linked to non-communicable diseases.
- Hospital Care: Hospitalisation is commonly needed for serious problems such as heart attacks, strokes, infections, or surgery, which adds both financial pressure and emotional stress.
- Post-Treatment Challenges: Older people often take longer to recover due to repeated infections, expensive medicines, and the need for intensive care—making the healing process harder.

Insurance Coverage – Gaps and Issues:

- Existing Schemes: Various programs like PM-JAY, CGHS, ESIC, and some state-specific ones aim to provide health cover. However, only around 20% of elderly people are actually insured.
- Unequal Access: Men and urban residents have better access to insurance compared to women and those in rural areas.
- Major Barriers: Many elderly people are unaware of available schemes. High premiums and complicated sign-up processes also keep them from enrolling.
- Limited Coverage: Important services like physiotherapy, rehabilitation, palliative care, and home-based support are often not included, forcing people to pay from their own pockets.

Why Healthcare Becomes Costlier with Age:

- Chronic Conditions: Diseases like hypertension or diabetes require continuous care and medications.
- Critical Care Needs: Older patients often need expensive ICU treatments due to multiple health problems.
- Insurance Limitations: Even when insured, many seniors face partial reimbursement, leaving them to cover a large part of the bill themselves.
- Recovery and Home Care: Services after hospital discharge, like rehabilitation or home nursing, are costly and typically not covered.
- End-of-Life Expenses: The absence of a structured policy for terminal care means families often bear the full financial load.

Steps Taken So Far:

- PM-JAY Expansion: Starting 2024, all citizens over 70 years of age are eligible for free healthcare under this scheme, regardless of income.

- State-Level Efforts: Some states, like Tamil Nadu, have merged their local health schemes with PM-JAY to broaden coverage.
- Elderly Health Programs: Special geriatric clinics and regional care centres are being established to cater specifically to older adults.
- Insurance Improvements: Efforts are underway to simplify the insurance process and widen what's covered.
- Better Public Hospitals: States like Kerala and Tamil Nadu have invested in strengthening facilities for senior citizens in government hospitals.

Remaining Challenges:

- High Personal Expenses: With many seniors not earning, paying for treatment themselves can lead to debt or worse.
- Rural Disadvantage: While urban elderly can access private healthcare, rural seniors largely depend on limited public resources and savings.
- Insurance Shortfalls: Low awareness, high costs, and limited benefits keep most elderly people from getting proper insurance.
- Lack of Specialists: India has a very small number of doctors trained in geriatric care—nowhere near what's needed.
- Ignored Areas: Preventive healthcare and palliative support continue to receive little attention.
- Gender Disparity: Elderly women are particularly vulnerable due to lower insurance coverage and weaker financial support.

The Way Ahead:

Better Financial Support:

- Expand government schemes to include home-based and rehabilitative care.
- Set caps on insurance premiums for seniors.
- Encourage people to save for healthcare in their working years through tax breaks and health savings bonds.

Improved Access:

- Invest in public health infrastructure modeled after successful states like Tamil Nadu and Kerala.
- Increase rural outreach using Health & Wellness Centres.

Preventive Focus:

- Launch a national vaccination program for older adults.
- Promote early detection of lifestyle diseases at local health centres.

More Awareness:

- Run large-scale campaigns to inform seniors about their rights and available insurance.
- Make sign-up processes simpler, and use mobile health units for remote areas.

Build Human Resources:

- Open geriatric departments in medical colleges.
- Train grassroots health workers to address elderly-specific health needs.

Conclusion:

As India transitions into an ageing society, it must prioritise the health and wellbeing of its senior citizens. The rising number of elderly people demands urgent attention to make healthcare more affordable, accessible, and inclusive. Ensuring that older adults live with dignity, good health, and financial security is essential for a fair and compassionate society.

Particularly Vulnerable Tribal Groups (PVTGs)

Context:

The Ministry of Tribal Affairs has requested that the upcoming national Census includes a separate count for Particularly Vulnerable Tribal Groups (PVTGs), aiming to improve the focus and reach of development initiatives.

Who Are PVTGs?

PVTGs are a special segment within the broader category of Scheduled Tribes (STs), recognised as being the most underprivileged and marginalised among tribal communities. This classification was first suggested by the Dhebar Commission in the early 1960s, which highlighted the need for targeted attention towards tribes facing deeper socio-economic challenges.

Initially, 52 tribal groups were identified during the Fifth Five-Year Plan (1974–79). In 2006, 23 more were added, bringing the total to 75.

Where Do They Live?

These communities are scattered across 18 states and also reside in the Andaman and Nicobar Islands. They are often located in remote and difficult-to-reach areas such as forests, hilly terrains, or isolated islands, where basic infrastructure and services are limited.

Some well-known PVTG communities include:

- Baigas – found in Madhya Pradesh and Chhattisgarh
- Abujh Marias
- Jarawas, Onges, Sentinelese, and Shompens – in the Andaman & Nicobar Islands

Key Features of PVTGs:

- Population Trends: Many of these groups have either stagnant or declining population numbers.
- Isolation: They typically live away from mainstream society and have limited contact with the outside world.
- Traditional Livelihoods: Most still rely on age-old practices like hunting, food gathering, and shifting cultivation.
- Education & Health: Literacy levels are low, and access to healthcare is minimal, making them more vulnerable than other tribal groups.
- Cultural Identity: These groups maintain unique customs, languages, and lifestyles that are often untouched by modern influences.

Why a Separate Enumeration Matters:

- First-Time Count: So far, PVTGs have not been distinctly identified in Census data; they've only been counted as part of the broader Scheduled Tribes category.
- Better Planning: Accurate data will help tailor welfare schemes in areas like healthcare, education, housing, and livelihood support.
- Improved Infrastructure: Identifying where PVTG communities live will allow better planning and implementation of infrastructure schemes like PM JANMAN, which was launched in 2023 with a 24,104 crore outlay.
- Cultural and Habitat Protection: Recognising and documenting these groups separately can aid in safeguarding their land rights and preserving their distinct cultural heritage.
- Policy Reassessment: Updated data will also help evaluate whether the criteria used to define PVTGs still hold, as some communities may have progressed while others continue to struggle.

The Apatani Tribe

Context:

In Arunachal Pradesh's Ziro Valley, elderly Apatani women represent the final generation to wear the tribe's distinctive facial tattoos and wooden nose plugs—an age-old tradition that was officially discontinued in the 1970s but still lives on in the memories and bodies of these women.

Who Are the Apatanis?

- The Apatani people, also referred to as Tanw or Apa Tani, are an indigenous tribe of Arunachal Pradesh.
- They are known for their rich cultural identity, deep ecological understanding, and unique customs that distinguish them from other tribal groups in the region.

Where They Live:

- The tribe resides mainly in the picturesque Ziro Valley, situated in the Lower Subansiri district.
- This high-altitude valley, surrounded by the eastern Himalayas, features fertile lands and a scenic, bowl-shaped landscape that supports agriculture and community life.

The Tradition of Facial Tattoos and Nose Plugs:

Origins and Purpose:

- Originally, facial tattoos and large wooden nose plugs served a practical purpose—protecting Apatani women from being abducted during tribal conflicts or raids by rival groups.
- Over time, this custom evolved into a cultural marker of identity, pride, and belonging within the community.

Symbolism:

- Protection: The tattoos and nose plugs were intended to reduce the perceived attractiveness of Apatani women to outsiders, acting as a form of self-defense.
- Cultural Identity: These features became a badge of honour and womanhood, representing dignity and social standing.
- Beauty Ideal: Within the tribe, these markings were not seen as disfigurements but as elements of traditional beauty and strength.

Tattooing Process and Design:

- Age of Tattooing: Girls typically received their tattoos around the age of 10.
- Tattooists: The procedure was carried out by experienced elder women in the tribe.

Design (Tippei):

- A single vertical line was tattooed from the forehead to the tip of the nose.
- Five lines were added across the chin.
- Nose Plugs (Yaping Hullo): After the tattooing, large wooden plugs were inserted into both nostrils. The wood was cleaned and treated to prevent infection.

Community Perception:

- Women who bore these marks were seen as dignified and respected, regarded as guardians of tradition and family honour.

Decline of the Practice:

- In the 1970s, the Indian government officially prohibited the practice, linking it to social stigma and concerns over limiting women's modern career opportunities.
- As a result, the custom faded over time, and today, only the elderly women of the tribe still carry these visible symbols of Apatani heritage.

Conclusion:

The facial tattoos and nose plugs of the Apatani women are more than just body modifications—they tell a story of survival, identity, and cultural pride. Though no longer practiced, these traditions live on through the women who wear them, offering a powerful reminder of the tribe's rich heritage in a rapidly changing world.

Loneliness Among India's Working Young

Context:

A growing emotional crisis is emerging among India's urban working youth, particularly those aged 25–35. Despite bustling city lives and social appearances, many face deep loneliness—an outcome of migration, work stress, and shifting social norms.

Understanding the Issue:

- Loneliness refers to a state of emotional detachment and social isolation, even in the midst of crowded offices or city life.
- It is increasingly visible in cities like Bengaluru, Gurugram, Pune, Hyderabad, and Chennai, where many young professionals live away from their families.

Key Observations & Data:

- In a study across 14 organisations:
- 56% of participants openly admitted feeling lonely.

- 23% acknowledged it privately but did not admit it.
- Only 21% said they did not feel lonely.
- Gender Gap: More women (64%) than men (36%) reported loneliness.
- Technology Use: Higher dating app usage among men (19%) compared to women (4%).
- The issue is most acute among migrants aged 25–35, who often lack support systems in new cities.

Causes of Rising Loneliness:

1. Urban Migration: Leaving behind familiar surroundings, families, and hometown cultures leads to disconnection.
2. Work–Sleep–Party Cycle: Long work hours, limited downtime, and surface-level socialising hinder meaningful connections.
3. Decline of Traditional Bonds: Kinship, neighbourly interactions, and local communities are fading in urban life.
4. Tech-Driven Relationships: Dating apps and speed-socialising often replace deeper, more organic friendships.
5. Rise of Individualism: A strong focus on career, image, and personal goals sometimes overshadows emotional needs and long-term bonds.

Impact of Loneliness:

1. Mental Health Struggles:

- Triggers anxiety, depression, and a sense of emptiness.
- Lack of emotional support weakens one's ability to handle stress.

2. Erosion of Social Capital:

- With fewer real-life connections, participation in community life drops.
- Trust, cooperation, and social engagement decrease, weakening society's collective strength.

3. Delayed Family Formation:

- Many delay marriage or starting families due to the absence of meaningful relationships.
- This alters demographic patterns and changes traditional family structures.

4. Cultural Shifts:

- As personal relationships become less stable, arranged marriages are making a comeback, offering more certainty through family involvement.

5. Workplace Challenges:

- Lonely employees are more likely to feel burned out, take frequent leaves, or quit jobs.
- Collaboration, innovation, and team productivity suffer in low-trust environments.

Way Forward:

Sociological Solutions:

- Rebuild community ties through local groups, clubs, and associations.
- Encourage youth participation in neighbourhood collectives.

Workplace Support:

- Implement HR policies that promote team bonding, mental health support, and a better work-life balance.

Digital Balance:

- Reduce overreliance on superficial connections through apps.
- Promote platforms that encourage genuine interactions and friendships.

Cultural Anchoring:

- Celebrate festivals, shared rituals, and local traditions to strengthen group identity and social bonding.

Policy Interventions:

- Urban planning must include parks, youth centres, and social spaces.
- Special support services for migrants to help them integrate socially.

Conclusion:

Loneliness among India's young workforce is more than a personal emotion—it reflects deeper societal changes tied to urbanisation, migration, and modern work culture. Solving it requires a holistic approach that strengthens community life, supports mental well-being, and balances the drive for individual success with the need for human connection. A truly thriving society must care for both the minds and relationships of its youth.

The Domestic Sphere in India

Context:

Recent discussions around dowry deaths, domestic violence, marital rights, and the undervalued unpaid labour of women have brought renewed focus on the domestic sphere as a site of structural inequality in India.

Current Realities:

- Gendered Violence and Inequality

Intimate Partner Violence (NFHS-5):

- 30% of women face domestic violence.
- Only 14% report or lodge complaints.

Dowry Deaths:

- Around 7,000 women die annually (2017–2022) due to dowry-related violence.

Unpaid Labour Burden (Time Use Survey 2024):

Women:

- Spend ~7 hours/day on household chores.
- Spend ~2.5 hours/day on caregiving.

Men:

- Contribute only 26 minutes to housework and 16 minutes to caregiving.

Invisible Economic Contribution:

SBI Report (2023):

- Estimated value of women's unpaid domestic work equals 7% of GDP (~ 22.5 lakh crore).

Essential Service Providers:

- Anganwadi, ASHA, and mid-day meal workers are considered volunteers, lacking formal status or benefits.

Ethical and Constitutional Dimensions:

- Article 14 & 15: Gender bias in the domestic sphere violates equality and non-discrimination principles.
- Article 21: Dignity is compromised through domestic violence and denial of rights in marriage.

Directive Principles:

- Article 39(d): Equal pay for equal work — not realised for care workers.
- Article 42: Just working conditions remain aspirational.
- 2nd ARC (Ethics in Governance): Identified patriarchy as a major threat to justice, accountability, and governance.

Why the Domestic Sphere Matters:

- Economic Impact:
- Women's unpaid labour reduces the cost of labour and subsidises the formal economy.

Social Reproduction:

- Women's caregiving ensures the next generation's health, education, and workforce readiness.

Democratic Health:

- Violence and inequality at home undermine social trust, productivity, and active citizenship.

Key Challenges:

1. Deep Patriarchy:

- Cultural glorification of sacrifice and "adjustment" in marriage.

2. Legal Gaps:

- Marital rape remains non-criminalised.
- Domestic Violence Act implementation is weak.

30. Economic Invisibility:

- Unpaid care work lacks recognition or compensation.

4. Labour Divide:

- Disproportionate burden across gender, class, and caste.

5. Institutional Apathy:

- Absence of strong political advocacy or robust policy attention.

Way Forward:

Legal & Structural Reforms:

- Recognise marital rape as a criminal offence.
- Strengthen the implementation of domestic violence laws.
- Provide formal employment, wages, and benefits to ASHA, Anganwadi, and other frontline women workers.

Economic Measures:

- Include unpaid labour in national accounts.
- Offer social security and pensions for unpaid caregivers.

Cultural Transformation:

- Campaigns promoting shared domestic duties between men and women.
- Gender sensitisation in schools and public platforms.

Policy Interventions:

- Universal child and elderly care services.
- Expand maternity and paternity benefits to redistribute caregiving roles.

Data-Driven Governance:

- Conduct regular Time Use Surveys to support gender-aware policymaking.

Conclusion:

The household is not just a private domain—it shapes public life, the economy, and democracy. Until women's invisible labour is acknowledged, their dignity ensured, and responsibilities fairly distributed, India's promise of equality and justice will remain incomplete. Real progress lies in transforming the domestic sphere into a space of shared responsibility, recognition, and respect.

Manki-Munda System

Context:

- Ho tribals of Jharkhand's Kolhan region staged protests against government interference in the Manki-Munda self-rule system after some traditional heads (Mundas) were removed.

What is the Manki-Munda System?

A traditional self-governance model of the Ho tribe in Jharkhand, based on customary laws, community participation, and hereditary leadership.

Origin & Historical Background:

Period	Details
Pre-British	Community-led governance, no tax or external rulers.
British Era	After Ho/Kol revolts, British recognised tribal autonomy.
1833	Captain Thomas Wilkinson codified 31 customary rules (Wilkinson's Rules).
1837	Implemented in Kolhan Government Estate (KGE); system legally integrated under British rule. Mankis & Mundas became intermediaries between the colonial government and the tribal population, preserving tribal autonomy within a colonial framework.

How the System Works:

Role	Description
Munda	Head of a single village; resolves local disputes.
Manki	Head of a pidh (cluster of 8–15 villages); hears appeals and broader issues.

- Based on customary tribal laws, not formal legislation.
- Continues post-Independence in many areas with limited state interference.

Key Features:

- Hereditary Leadership: Passed father to son within tribal families.
- Community-Based Justice: Involves village elders, similar to Gram Sabha functioning.
- Cultural & Land Autonomy: Preserves Ho tribal identity, rituals, and land rights.
- Legal Recognition: Wilkinson's Rules still hold legal weight, as upheld in multiple court rulings due to lack of modern governance alternatives in these areas.

Recent Issues:

- Alleged state interference in the appointment/removal of Mundas.
- Seen as a threat to tribal self-rule and autonomy.
- Sparked protests by Ho tribal groups in 2025.

Why It Matters (Significance):

Area	Significance
Tribal Governance	Offers a successful example of customary self-governance in India.
Legal Pluralism	Co-existence of tribal and formal legal systems.
Decentralisation	Empowers grassroots leadership and dispute resolution.
Tribal Rights	Important for Fifth Schedule Areas, tribal identity, and land preservation.

Swasth Nari, Sashakt Parivar Abhiyaan

Context:

The Prime Minister is set to launch India's largest women and child health campaign alongside the 8th edition of Poshan Maah (Nutrition Month) in 2025.

What is it?

A nationwide health and nutrition mobilisation drive focused on empowering women and families through early disease detection, nutrition awareness, and preventive healthcare.

- Led by: Ministry of Health & Family Welfare (MoHFW) and Ministry of Women & Child Development (MoWCD).
- Integrated with: Poshan Maah 2025 for a unified outreach effort.
- Approach: Whole-of-government and whole-of-society model.

Objectives:

- Ensure early detection and treatment of key health conditions
- Non-communicable diseases (NCDs)
- Cancer (breast, cervical, oral)

- Tuberculosis
- Anaemia
- Sickle Cell Disease

Promote awareness around:

- Nutrition and dietary diversity
- Menstrual hygiene
- Mental well-being
- Healthy lifestyle choices

Key Features:

Health Camps (17 Sept – 2 Oct 2025):

- Over 1 lakh health camps across India.
- Locations: Community Health Centres (CHCs), District Hospitals, Ayushman Arogya Mandirs.

Specialist Services:

- Gynaecology, Paediatrics, Eye, ENT, Dental, Skin, Mental Health.

Screening & Diagnostics:

- Blood Pressure, Blood Sugar, BMI
- Cancer screenings (breast, cervical, oral)
- Oral hygiene and visual health checks

Anaemia & Nutrition Focus:

- Haemoglobin testing
- Iron and folic acid supplementation
- Deworming
- Annaprashan ceremonies for infants
- Nutrition recipe demonstrations
- Awareness via FSSAI's Eat Right campaign

Maternal & Child Health Services:

- Antenatal care (ANC)
- Growth monitoring
- Immunisation drives
- Distribution of Mother-Child Protection (MCP) cards

Significance:

- Enhances health literacy among women and caregivers.
- Fosters a preventive health culture.
- Improves early intervention for diseases often ignored in rural and underserved areas.
- Strengthens convergence between health and nutrition programmes.

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.

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

Context:

Members of the Development and Welfare Board for DNT, NT, and SNT communities have urged the Prime Minister to grant the board permanent commission status with adequate funding, staffing, and decision-making authority.

Who Are They?

De-notified Tribes (DNTs):

These are communities that were once labelled as "criminal tribes" under a colonial-era law, which treated them as hereditary offenders.

Nomadic Tribes (NTs):

Groups that move from place to place to sustain their livelihoods — often engaged in activities like salt trading, animal rearing, folk performances, or artisan crafts.

Semi-Nomadic Tribes (SNTs):

These communities migrate less frequently than full nomads, often covering shorter distances and living semi-settled lives.

Historical Background:

- During British rule, the Criminal Tribes Act (1871) categorised nearly 200 communities as "criminal by birth."

- In 1952, the Act was repealed, and the communities were officially de-notified.
- A commission in 2008 highlighted the deep marginalisation faced by these groups.
- Another commission in 2017 identified over 1,200 such communities, some already recognised as SC/ST/OBC, while many remained outside any formal classification.

Present Situation:

- Estimated to make up about 10% of the population, around 13 crore people.
- Spread across the country with about 150 de-notified tribes and 500+ nomadic/semi-nomadic groups.

Cultural Identity:

- These communities have rich cultural traditions, including distinct religious practices, festivals, oral storytelling, and customary dispute resolution.
- Traditionally, they travelled in small family-based groups, with annual gatherings used for social bonding, marriages, and economic exchanges like livestock trade.

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

What It Is:

A government body formed to advise and coordinate welfare schemes aimed at these communities, functioning under the Ministry of Social Justice and Empowerment.

When Formed:

Established in February 2019, based on recommendations of a national-level commission.

Why It Was Created:

Instead of forming a separate constitutional commission, this board was created to avoid duplication with existing commissions for Scheduled Castes, Scheduled Tribes, and Other Backward Classes.

Structure:

- Chairperson: Secretary of the Ministry (ex-officio).
- Members: Two nominated individuals, with three seats currently vacant.
- Also includes representatives from other relevant departments like Tribal Affairs and School Education.

Key Roles and Functions:

- Policy Advice: Recommends legal classification and recognition of communities.
- Scheme Oversight: Monitors implementation of schemes like scholarships, hostels, and skill development under initiatives such as SEED.
- Grievance Handling: Acts as the central authority to address issues faced by the communities.
- Research & Data: Supports data collection, research, and surveys for evidence-based policymaking.
- Coordination with States: Works with state governments to facilitate community certificates, housing, land rights, and educational access.

Need for Strengthening the Board:

- The current board lacks financial autonomy, permanent staff, and decision-making authority.
- Strengthening it could improve service delivery and ensure focused, long-term support for these historically excluded communities.

From Promises to Participation: Reimagining Transgender Rights in India

Context:

Recently a 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.

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).
1. 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.
1. 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.
1. 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.
1. 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%).
1. 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.

1. 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.
1. 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.
1. 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.

1. Swachh Bharat Mission (Grameen) and Jal Jeevan Mission

The Government of India's launch of Swachh Bharat Mission (Grameen) [SBM-G] in 2014 and Jal Jeevan Mission (JJM) in 2019 marked two defining interventions in rural governance. These initiatives go beyond service delivery in sanitation and drinking water.

- They represent a shift towards participatory governance, community-led behavioral change, and institutional resilience, aligned with the vision of "Sabka Saath, Sabka Vikas, Sabka Vishwas, Sabka Prayas."
- Together, they form a continuum of rural transformation—where sanitation and water converge to advance public health, uphold dignity, empower women, and lay the foundations for Viksit Bharat @ 2047.

Achievements of Swachh Bharat Mission (Grameen)

- Sanitation Coverage: Rural sanitation coverage expanded from 39% in 2014 to 100% in 2019, declaring India Open Defecation Free (ODF).
- Phase II (2020-21 onwards): Focus shifted to ODF Plus, i.e., sustaining ODF gains, managing solid & liquid waste, and visual cleanliness. As of July 2025:
- 96% of villages are ODF Plus.
- 4.70 lakh villages are ODF Plus Model villages.
- Health Impact: WHO (2018) estimated 3 lakh diarrheal deaths avoided by SBM-G in 2019 compared to 2014. UNICEF-BMGF studies confirmed improvements in Suvidha (convenience), Suraksha (safety), and Swabhimaan (self-respect) of women.
- Sanitation was reframed not just as infrastructure but as a symbol of dignity, equity, and citizen–state partnership.

Achievements of Jal Jeevan Mission

- Household Tap Connections: As of July 2025, JJM has provided 15.67 crore functional household tap connections (over 80% coverage).
- Public Institutions: All schools and Anganwadis now covered with piped water supply.
- Women Empowerment: Over 24 lakh women trained to test water quality using Field Testing Kits; emergence of Jal Sakhis and Jal Sahiyas.
- Governance Innovation: Panchayats and Village Water and Sanitation Committees empowered for planning, operation, and maintenance.

A WHO report projects JJM's outcomes as:

- Preventing 4 lakh diarrhoeal deaths annually.
- Saving 5.5 crore person-hours daily (mainly women's time).
- Generating economic benefits of 8.28 lakh crore.

Profound Socio-Economic Impacts

- A Nature (2024) study highlighted SBM's contribution to reducing infant and under-five mortality rates, averting 60,000–70,000 infant lives annually.
- JJM is projected to create 60 lakh person-years of direct jobs and over 2 crore person-years of indirect employment during its implementation phase.
- Groundwater quality: ODF villages were found to be 12.7 times less contaminated than non-ODF ones (UNICEF study, 2018-19).

Together, these missions have improved public health, gender equity, rural productivity, and environmental sustainability.

Towards a SMART Future of SBM-G

The future trajectory of SBM-G and JJM is guided by a SMART approach:

- Sustainability: Transition from infrastructure creation to system management, robust O&M protocols, and climate-linked sanitation solutions.
- Making Women Central: Institutionalizing women's leadership through SHGs, Rani Mistris, Swachhagrahis, and women-led O&M enterprises.
- Accelerating Private Sector Involvement: Scaling up GOBARdhan, circular economy models, and CSRbacked sanitation ventures.
- Re-establishing Communication Protocols: Driving deeper behavioural change around waste segregation, menstrual hygiene, and digital awareness campaigns.
- Training & Technology: Smart sanitation villages, IoT-based monitoring, solar-powered STPs, and realtime water quality systems.

Jal Jeevan Mission 2.0: Beyond the Tap

The Mission has been extended till 2028, with a shift from coverage to sustainability. Four strategic directions define its next phase:

1. From Tap Coverage to Water Security: Source sustainability via Catch the Rain campaign, spring shed management, aquifer recharge, and rainwater harvesting.
2. From Infrastructure to Innovation: IoT, real-time monitoring dashboards, and climate-smart villages.
3. From Beneficiaries to Co-Creators: Institutionalizing Gram Panchayat ownership, powered by Jal Doots and Jal Sakhis.
4. From Silos to Synergy: Ensuring cross-sector linkages between water, health, education, nutrition, and agriculture.

The vision is to enable every village to become a Swachh Sujal Gaon—with safe water, ODF Plus certification, and holistic well-being.

Alignment with SDGs and Governance Transformation

Both SBM-G and JJM are central to SDG 6 (Clean Water and Sanitation) and catalyze progress towards SDGs on health, education, gender equality, and poverty reduction.

Their deeper legacy lies in governance transformation:

- Decentralized, community-led planning.
- Empowerment of Panchayats and self-help groups.
- Institutionalization of Jan Bhagidari (people's partnership).

What began as infrastructure creation has evolved into a new paradigm of localized governance and citizen empowerment, reinforcing India's pathway towards Viksit Bharat by 2047.

2.WASH for Women, WASH for the Nation

India's rural transformation in the last decade has been shaped by two flagship schemes: Swachh Bharat Mission (Grameen) and Jal Jeevan Mission.

- While these missions have expanded sanitation and water access to unprecedented levels, their most enduring contribution lies in redefining the role of women in rural governance.
- From being passive users, women have become custodians, managers, and leaders of India's WASH revolution.

The Gendered Dimensions of WASH

Traditionally, women bore the invisible burden of water collection, household sanitation, and hygiene management. This restricted their education, health, mobility, and livelihoods. Inadequate WASH also deepened vulnerabilities during menstruation, pregnancy, and old age. Recognizing these gendered barriers, SBM-G and JJM embedded women's dignity, safety, and leadership as central design features.

Women's Leadership in WASH

Both missions institutionalized women's participation, mandating that 50% of Village Water and Sanitation Committee (VWSC) members be women, including leadership roles like president, secretary, and treasurer.

- Under SBM-G Phase I (2014-19): Women mobilized communities as Swachhagrahis and Nigrani Samitis, successfully leading the ODF campaign.
- Under SBM-G Phase II (2020 onwards): Women-led SHGs manage community sanitary complexes, solid and liquid waste management, and faecal sludge treatment.
- Under JJM: Over 24.8 lakh women trained in water quality testing; women serve as Jal Sakhis and Jal Sahiyas operating pumps, managing distribution lines, and ensuring daily water supply.

Notable examples include the Maa Narmada Jal Samiti in Madhya Pradesh, managed entirely by tribal women overseeing chlorination, maintenance, and billing of village water systems.

Impact of Women in WASH

Women's leadership has translated into measurable outcomes:

- Higher compliance with hygiene protocols and user fee collection.
- Sustainability of assets, with better O&M of water schemes and toilets.
- Behavioral change in taboo subjects like menstrual hygiene and pit emptying.
- Community trust and participation, as women-led committees resolve complaints faster and mobilise higher contributions for water user charges.

Contribution to SDGs

The empowerment of women through WASH has ripple effects across development goals:

- SDG 3 (Health): Reduction in diarrheal diseases, child mortality, and improved menstrual hygiene.
- SDG 4 (Education): Improved school attendance of girls due to functional toilets and safe water.
- SDG 5 (Gender Equality): Formal inclusion of women in WASH governance enhances dignity, decisionmaking powers, and socio-economic opportunities.
- SDG 6 (Clean Water & Sanitation): Ensures universal, sustainable access while making systems community-owned.
- SDG 8 (Livelihoods): Women-led enterprises in sanitation products, faecal sludge management, and greywater treatment create rural employment.

Way Forward: Institutionalizing Women-Led WASH

To sustain these gains and deepen inclusivity, the next phase must focus on:

- Institutionalizing leadership: Expanding women-led VWSCs and recognizing top-performing women Panchayats during Swachh Bharat Diwas.
- Capacity building: Modular e-learning through SBM Academy and JJM Digital Academy for training in finance, grievance handling, and technical operations.
- Sanitation enterprises: Supporting SHGs with capital and technical know-how to run MHM product units, FSTPs, and waste-to-energy plants.
- Convergence: Synergy with the National Rural Livelihood Mission, Ministry of Women & Child Development, and Panchayat Development Plans.

Conclusion

The story of WASH in India is, increasingly, the story of women. From walking miles to fetch water, to now managing piped water supply systems; from being silent sufferers of inadequate sanitation, to leading SHGs and governance committees—women have powered the transformation of SBM-G and JJM from schemes to Jan Andolans.

If sustained and scaled, women-led WASH is not only central to achieving Har Ghar Jal and ODF Plus villages, but also to advancing India's march towards Viksit Bharat @ 2047—where grassroots leadership and gender justice form the core of national development.

3. A Decade of WASH: Transforming Rural India

Over the past decade, India has witnessed a quiet but transformative revolution in the Water, Sanitation, and Hygiene (WASH) sector, led by the twin flagship missions: Swachh Bharat Mission-Gramin (SBM-G) and Jal Jeevan Mission (JJM). These programs have redefined rural development by integrating technology, empowering Gram Panchayats, and involving communities in planning, execution, and monitoring. The impact has been far-reaching—enhancing health, dignity, livelihoods, social inclusivity, and economic outcomes.

Historical Context

India's engagement with WASH issues is longstanding:

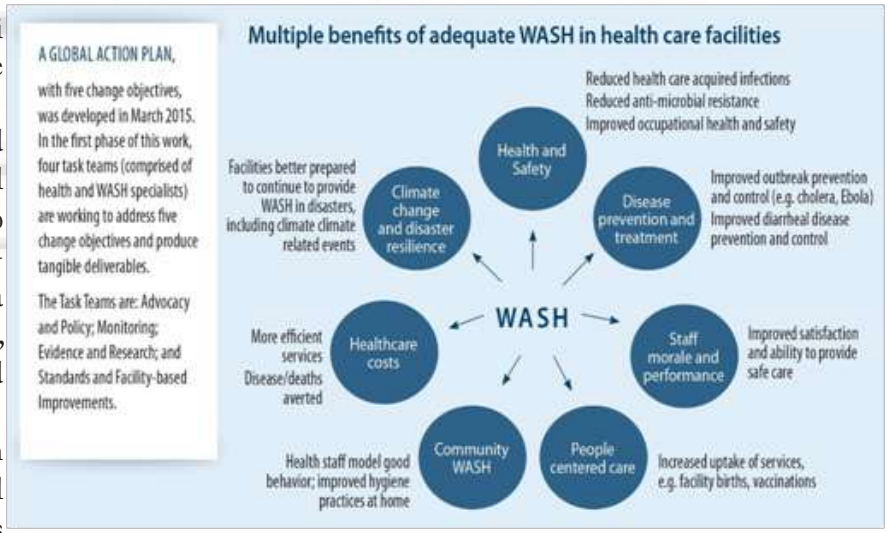
- Ancient Era: The Indus Valley Civilization (c. 2500 BCE) had advanced urban planning with covered drains and household toilets.
- Colonial & Post-Independence Periods: Sanitation became a neglected public priority, compounded by caste-based stigma around sanitation work.
- Post-1951 Planning: Health, water, and sanitation were gradually integrated into national plans, starting with the First Five-Year Plan and initiatives like the Central Rural Sanitation Programme (1986), the Total Sanitation Campaign (1999), and the Nirmal Bharat Abhiyan (2009).

Similarly, rural water supply initiatives evolved from the National Water Supply Programme (1954) to Accelerated Rural Water Supply Programme (1972), National Drinking Water Mission (1986), and later reforms like Swajaldhara (2002), NRDWP (2009-10), and NWQSM (2017). Despite these efforts, progress remained fragmented, with insufficient focus on community engagement and behavior change.

The Turning Point: 2014 Onwards

In 2014, Prime Minister Narendra Modi called for an Open Defecation Free (ODF) India, marking a paradigm shift:

- SBM-G: Over 10 crore household toilets constructed, raising rural sanitation coverage from 39% (2014) to 100% (2019). SBM-G Phase II focuses on Sampoorna Swachhata (ODF Plus), emphasizing solid and liquid waste management (SLWM).
- JJM: Launched in 2019 with the goal of providing Functional Household Tap Connections (FHTCs) to every rural household, ensuring safe, adequate, and continuous drinking water supply (≥55 litres per capita per day, BIS 10500 standards).



These missions have shifted WASH from infrastructure-centric to people-centric, with Gram Panchayats and Village Water & Sanitation Committees (VWSCs) playing central roles.

Community-Led Transformation

- Gram Panchayats prepare Village Action Plans (VAPs) covering water sources, supply, and greywater management.
- VWSCs ensure community participation, with ≥50% women members. Over 5.2 lakh VWSCs have been formed across 5.85 lakh villages.

- Women SHGs, schoolchildren, and retired personnel are key actors in behaviour change, sanitation maintenance, and water management.

Technological Innovations

- Twin Pit Toilets: Affordable, low-maintenance, eco-friendly.
- Solar-Powered Water Systems: Reduce dependency on grid electricity.
- Insulated Pipes in Ladakh: Ensure water supply in sub-zero temperatures.
- Floating Water Schemes (Gujarat): Resilient against floods.
- IoT & Real-Time Monitoring: Flow meters, chlorine analysers, dashboards for preventive maintenance and grievance redressal.

Water Quality:

- 2,183 laboratories test water samples; mobile testing vans enhance accessibility.
- WQMIS allows citizens to check water quality online.

Behaviour Change & Citizen Engagement

- IEC campaigns like Swachhagrahi, Darwaza Band, Jal Utsav, Swachh Sujal Gaon, Swachh Sujal Shakti Samman foster awareness.
- Women-led initiatives like Jal Saheli, Jal Sakhi, Jal Sahiya drive water conservation, maintenance, and community mobilization.
- Convergence with MGNREGS, NHM, Samagra Shiksha ensures sustainability and optimal resource use.

WASH in Schools and Anganwadis

Aligned with NEP 2020 and SDGs 4 & 6, WASH in educational institutions ensures health, dignity, and educational outcomes:

- Infrastructure: Separate toilets for girls, ramps, accessible toilets for children with disabilities, safe drinking water.
- Behaviour Change: Swachh Vidyalaya, Swachhata Pakhwada, Swachhata Hi Seva, mass handwashing campaigns.
- Sustainability: Rainwater harvesting, greywater reuse, rooftop systems, and kitchen gardens.
- Monitoring: UDISE+, PRABANDH portals, geo-tagged infrastructure, mobile apps, digital dashboards.

Way Forward

As India aims for Viksit Bharat @2047, WASH priorities include:

1. Sustaining ODF Plus & Swachh Sujal Gaons through institutionalized SLWM systems.
2. Universal and equitable access to safe drinking water, prioritizing marginalized communities.
3. Digital transformation using IoT, AI, GIS, and mobile-based monitoring for climate-smart infrastructure.
4. Capacity building of rural engineers, VWSCs, and barefoot technicians.
5. Strengthening Gram Panchayats as local service providers with inter-departmental coordination.

Conclusion

In ten years, India has progressed from sanitation deprivation to dignity, water scarcity to security, and top-down to community-driven governance. SBM and JJM have demonstrated that policy, technology, and people, when aligned, can transform the everyday lives of rural citizens. The WASH revolution embodies inclusive development, gender empowerment, public health, and participatory democracy, offering a model for sustainable growth in the Amrit Kaal.

4. Empowering Women & Nurturing Children

Access to clean water, adequate sanitation, and improved hygiene practices—collectively termed WASH—constitutes a fundamental human right. It is central to promoting gender equality, enhancing child development, and fostering inclusive socio-economic progress.

Gender Dimension of WASH

In India, the burden of water collection and sanitation management disproportionately falls on women and girls, often consuming several hours daily. This limits their educational opportunities, participation in economic activities, and engagement in community affairs. Inadequate sanitation facilities also expose women to health risks, violence, and harassment. Key WASH-related gender challenges include:

- Menstrual Hygiene Management (MHM): Lack of safe, private facilities reduces girls' school attendance and dignity.
- Safety and Dignity: Access to toilets lowers exposure to harassment.
- Time Burden: Nearby water sources free time for education, skill development, and income generation.
- Empowerment: Women's participation in community-level WASH decision-making strengthens leadership and agency.

Child Well-being and WASH

Safe water and sanitation are critical for child survival, growth, and development. Poor WASH conditions contribute to diarrhoeal diseases, malnutrition, and school absenteeism. Benefits of improved WASH for children include:

- Improved Health: Reduced incidence of waterborne diseases such as diarrhoea, cholera, and typhoid.
- Better Nutrition: Cleaner environments improve nutrient absorption and combat malnutrition.
- School Attendance: Functional toilets, especially for girls, increase enrolment and retention.
- Early Childhood Development: Hygiene education in Anganwadi Centres (AWCs) promotes healthy habits from an early age.

Integrating WASH into Government Programs

The Ministry of Women and Child Development (MoWCD) has embedded WASH into flagship programs to advance gender equality and child development objectives.

1. Mission Saksham Anganwadi & Mission Poshan 2.0:

- Covers over 14 lakh AWCs and more than 10 crore beneficiaries, including children, pregnant women, lactating mothers, and adolescent girls.
- Provides services such as supplementary nutrition (Hot Cooked Meals, Take-Home Rations), Early Childhood Care and Education (ECCE), health check-ups, and immunisation.
- Promotes WASH through community-based events (CBEs) and home visits—over 7 crore CBEs and 2 crore home visits since 2018.

2. Infrastructure Development:

- Currently, 10.27 lakh AWCs have functional toilets, and 12.53 lakh have drinking water facilities.
- The Saksham Anganwadi Centres initiative upgrades AWCs with improved infrastructure, water filtration systems, ECCE materials, and Poshan Vatikas.

3. Scheme for Adolescent Girls (SAG):

- Targets 23 lakh adolescent girls in NE States and Aspirational Districts.
- Focuses on nutrition, health, menstrual hygiene, and peer-led hygiene education.

4. Special Campaigns and Jan Andolans:

- Campaigns such as Poshan Maah, Poshan Pakhwada, and Special Campaign 3.0 promote hygiene, sanitation, and community engagement in AWCs and public spaces.

5. Mission Shakti & Beti Bachao Beti Padhao (BBBP):

- Combines gender sensitisation with hygiene promotion, addressing dropout rates among adolescent girls due to inadequate sanitation.

6. Pradhan Mantri Matru Vandana Yojana (PMMVY) & Mission Vatsalya:

- Promote antenatal care, childcare, and hygiene awareness for mothers and infants.
- Include Swachhata Action Plan (SAP) funds for Child Care Institutions (CCIs) and service delivery structures.

Strategic Approaches for WASH Success

- Community Engagement: Women's Self-Help Groups (SHGs) and community volunteers are actively involved in greywater management, toilet maintenance, and hygiene promotion.
- Behavioral Change: Mass campaigns, home visits, and school-based programs foster long-term adoption of WASH practices.

- Inter-sectoral Convergence: Collaboration across Ministries (Education, Health, WCD) and Departments ensures resource optimisation and sustainable outcomes.

Way Forward

Sustainable WASH implementation requires:

- Universal access to safe water and functional toilets, especially for marginalised communities.
- Continued investment in behavioural change communication and community mobilisation.
- Strengthening AWCs and adolescent programs to integrate WASH with nutrition, health, and education outcomes.
- Enhancing monitoring, data-driven decision-making, and inter-departmental coordination.

Conclusion

WASH is not merely a matter of infrastructure; it is a catalyst for empowerment and development. By ensuring clean water, sanitation, and hygiene, India is empowering women, nurturing children, breaking cycles of malnutrition and gender inequality, and fostering participatory governance. Programs like JJM, SBM, Mission Poshan 2.0, and Saksham Anganwadis exemplify how targeted interventions, community engagement, and technological innovation can transform lives and accelerate inclusive development.

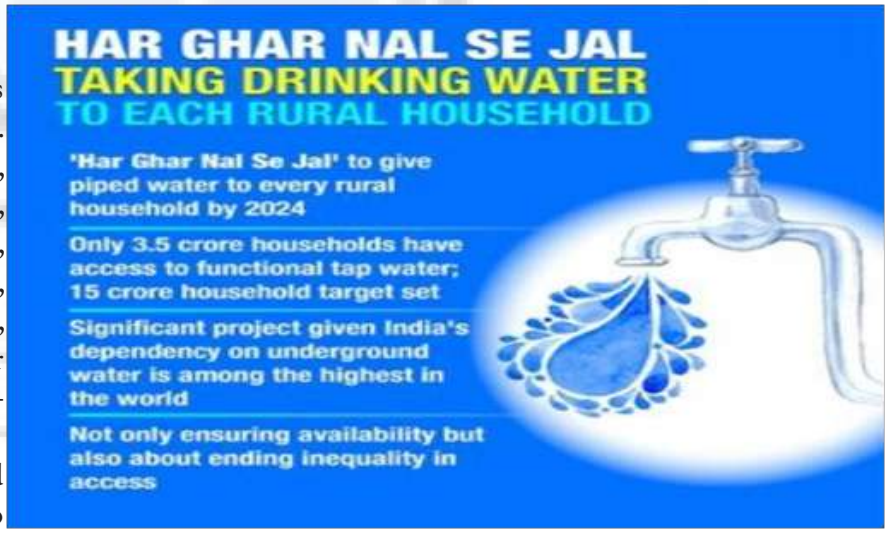
5.Har Ghar Jal

Water is a fundamental resource and a cultural and developmental imperative in India. Despite its importance, access to safe and adequate drinking water has long eluded millions, particularly in rural areas.

- The launch of the Jal Jeevan Mission (JJM) in August 2019 marked a historic intervention to provide Functional Household Tap Connections (FHTCs) to every rural household, while institutionalizing sustainability, equity, decentralization, and community participation in water governance.

Progress and Coverage

As of May 2025:



- Over 15.62 crore rural households (~80%) have tap water connections.
- Eight states and three UTs—Goa, Arunachal Pradesh, Haryana, Punjab, Telangana, Mizoram, Himachal Pradesh, Gujarat, Andaman & Nicobar Islands, Puducherry, and Dadra & Nagar Haveli and Daman & Diu—achieved 100% coverage.
- Aspirational districts improved from 7.77% coverage in 2019 to 79.13% today.
- Schools and Anganwadi's have coverage of 89.57% and 85.54%, respectively.

JJM is not only about infrastructure; true success lies in sustainable, reliable service delivery—ensuring sufficient quantity, prescribed quality (BIS 10500), and regularity of supply.

Sustainability Framework

JJM adopts a multi-dimensional approach to sustainability:

- Source Sustainability: Aquifer recharge, watershed development, spring shed management, afforestation, and renovation of traditional water bodies.
- Institutional Sustainability: Strengthening Village Water and Sanitation Committees (VWSCs), District Water & Sanitation Missions (DWSMs), and State Water & Sanitation Missions (SWSMs).
- Financial Sustainability: Community-based cost recovery, convergence of funds, and inclusive financing models.
- Social & Environmental Sustainability: Stakeholder participation, greywater management, and ecological safeguards.

Greywater management is central to sustainability. Community-level solutions—soak pits, kitchen gardens, constructed wetlands, and decentralized wastewater treatment systems (DEWATS)—convert wastewater into a resource for irrigation, reducing pressure on groundwater.

Technology as an Enabler

JJM integrates digital monitoring and IoT:

- Dashboards at village (VWSM), district (DWSM), and state (SWSM) levels provide actionable data for Panchayati Raj functionaries, District Collectors, and State Mission Directors.
- Water Quality Management Information System (WQMIS) manages laboratory and field testing data. Over 2,183 water testing labs are functional nationwide.
- Citizen Corner on the JJM portal ensures transparency by providing real-time scheme data to communities.
- Over 24.83 lakh women trained in Field Testing Kits (FTKs) conduct on-the-spot water quality assessments.

Community Participation

JJM's transformative feature is people-centric governance:

- 5.14 lakh VWSCs formed with 50% women representation.
- Self-Help Groups (SHGs) manage water quality testing, minor repairs, and tariff collection.
- Nal Jal Mitra Programme (NJMP): Field-level operators trained to manage pumps, valves, treatment units, and preventive maintenance.

This participatory model ensures that water systems are owned, maintained, and respected locally, moving from a top-down provision model to community-led stewardship.

Way Forward

To achieve long-term water security, JJM must:

- Focus on inclusive governance and adaptive resilience, especially in tribal, LWE-affected, and climatesensitive regions.
- Integrate water quality challenges (fluoride, arsenic, salinity) into risk management.
- Strengthen convergence with other flagship schemes (Swachh Bharat Mission-Grameen, MGNREGS) to optimize resources.
- Promote local stewardship and behavioral change to embed WASH culture.

6. Light House Initiative

India's rural sanitation journey has witnessed a remarkable transformation from widespread open defecation to Open Defecation Free (ODF) villages, driven by the Swachh Bharat Mission-Grameen (SBM-G) since 2014. While ODF declaration marked a historic achievement, sustaining gains, managing solid and liquid waste, and embedding sanitation into rural governance remain ongoing challenges.

Within this evolving landscape, the Light House Initiative (LHI) Phase-1 (2022) emerged as a collaborative effort led by the Department of Drinking Water and Sanitation (DDWS), the India Sanitation Coalition (ISC), and corporate partners. The goal: support 75 Gram Panchayats (GPs) to become Light House GPs, showcasing community-led, sustainable sanitation models.

Achievements of Phase 1

- Community-led innovations: Villages like Nadimapalem (Andhra Pradesh) implemented Rs 1/day user fee for waste collection, achieving 90% source segregation and integrating home composting into the circular economy.
- Capacity building: Phase 1 highlighted the importance of institutional capacity, funding alignment, and grassroots ownership.
- Recognition: Several GPs earned state-level awards for sustainable waste management practices.

Transition to Phase 2

Building on Phase 1 insights, LHI Phase 2 (July 2024–March 2025) expands to 43 Blocks across 37 districts in 14 States/UTs, including Assam, Bihar, Chhattisgarh, Gujarat, Haryana, Jharkhand, Karnataka, Madhya Pradesh, Maharashtra, Odisha, Punjab, Rajasthan, Tamil Nadu, and Uttar Pradesh.

Objectives:

1. Support SDG Target 6.2 for equitable sanitation access.
2. Establish ODF Plus Model Blocks as replicable examples.
3. Enable corporate and public sector collaboration for innovative, decentralized sanitation solutions.
4. Demonstrate sustainable Operations & Maintenance (O&M) models for Solid and Liquid Waste Management (SLWM) assets.

Methodology and Approach

- Community leadership: Village Water & Sanitation Committees (VWSCs), Self-Help Groups (SHGs), and local champions drive planning and implementation.
- Data-driven monitoring: Regular assessments, dashboards, and IEC/BCC campaigns inform decisionmaking.
- Technology integration: Tools support O&M, water quality, and waste management.
- Financial models: User-fee systems ensure sustainable O&M funding.

Challenges and Opportunities

- Early integration of corporate partners in planning improves alignment.
- Community ownership is key for speed, sustainability, and compliance.
- Inclusion focus: Marginalized groups, women, and persons with disabilities are prioritized.
- Technology and monitoring support scalable, accountable sanitation governance.

1. Fostering Jobs, Building Bharat: ELI Scheme as a Gamechanger

The Employment Linked Incentive (ELI) Scheme is a transformative initiative launched by the Government of India to bolster employment generation, enhance employability, and provide social security, with a special focus on the manufacturing sector.

- Announced as part of the Prime Minister's package of five schemes in the Union Budget 2024-25, the ELI Scheme came into effect on 1st August 2025, with a projected outlay of Rs. 99,446 crore.

Its primary objectives are to:

- Ensure equitable access to economic opportunities.
- Reduce unemployment and promote self-reliance.
- Strengthen the industry workforce and foster inclusive and sustainable economic growth.

Table 1: Employment Linked Incentive (ELI) Scheme: A Brief Overview

S.No.	Dimensions	Descriptions
1	Objective (s)	• To place a special focus on the manufacturing sector, • To support employment generation, • To enhance employability, and • To extend and ensure social security across all sectors.
2	Budget	• Total Outlay: Rs. 99,446 Crores.
3	Scope and Scale	• Pan-India implementation with a target to create 35 million jobs in two years' timeframe.
4	Time Duration	• The scheme benefits are applicable to jobs created between 01.08.2025 and 31.07.2027.
5	Major Outcome	• Job creation & formalisation of the country's workforce by extending social security coverage to crores of young men and women.

Evolution of Employment and Skill Development Initiatives in India

Government employment programmes have evolved from broad-based initiatives to targeted, skill-focused approaches aimed at enhancing the employability of youth. Key programmes include:

- Skill India Mission (SIM) – Provides training, reskilling, and upskilling through schemes such as Pradhan Mantri Kaushal Vikas Yojana, National Apprenticeship Promotion Scheme, and Craftsman Training Scheme via Industrial Training Institutes (ITIs).
- Sector Skill Councils (SSCs) – 36 councils led by industry leaders identify skill requirements and competency standards across sectors.
- National Skill Development Corporation (NSDC) – Supports industry-aligned training providers.
- Skill India Digital Hub – Integrates skilling, education, employment, and entrepreneurship ecosystems.
- Deen Dayal Upadhyaya–Grameen Kaushal Yojana & Rural Self-Employment Training Institutes – Focus on skill development for rural youth in agriculture, handloom, tourism, etc.

Earlier schemes, such as Aatmanirbhar Bharat Rojgar Yojana (2020-22), incentivized job creation and restoration post-COVID-19, benefiting over 60 lakh individuals through 1.52 lakh establishments.

Why ELI Scheme is Distinct

Unlike traditional skill-development schemes, ELI focuses on:

- Skill-employment linkage: Training directly tied to sector-specific employment opportunities.
- Accountability: Employers, industries, and training entities are jointly responsible for actual job creation.
- Tailored training: Demand-driven courses mapped to industry requirements.
- Formal employment promotion: Encourages official job registration at government institutions.

The scheme is implemented in two parts:

- Incentives for first-time employees – Encouraging youth to join the formal workforce.
- Support for employers – Directed at generating additional employment, with particular emphasis on manufacturing.

Stakeholder Integration and Implementation

Effective execution of ELI requires multi-agency coordination, leveraging technology and regulatory compliance. Key activities include:

- Onboarding employers and employees on digital platforms.
- Monthly submission of Electronic Challan-cum-Return (ECR) with Aadhaar authentication.
- Cross-verification with IT/GST/PAN data.
- Real-time monitoring, performance dashboards, and retention tracking.
- Fraud detection, random audits, and enforcement of provisions.
- Key stakeholders include the Ministries of Labour, Skill Development and Entrepreneurship, Finance, Revenue, EPFO, UIDAI, NPCI, employers, employees, auditors, and third-party monitoring agencies.

Addressing Challenges: Potential challenges and solutions include:

- Fake/ghost employee records: Cross-verification with EPFO, Aadhaar, PAN, GST, IT filings; biometric checks.
- Salary under-reporting: Comparison of ECR with bank transfers, salary slips, and IT returns; imposition of penalties for violations.
- Employee attrition: Employer sensitization on retention incentives.
- Low awareness: Outreach through state/district labour offices, MSME field offices, trade unions, and social media.
- Weak training delivery: Partnerships with NGOs, cooperatives, and Common Service Centres to enhance access.
- Monitoring and fraud detection: AI/ML integration for real-time alerts; targeted third-party audits.

Lessons from high-budget programmes like MGNREGA underline the need for robust grievance redressal mechanisms, data validation, and timely interventions.

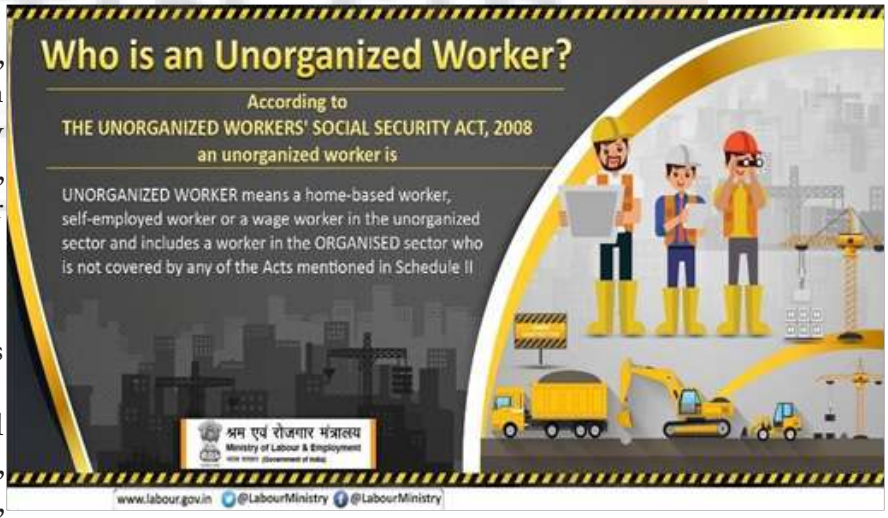
Conclusion

The ELI Scheme represents a paradigm shift in India's employment landscape, bridging the gap between skill development and actual employment. By offering monetary incentives linked to job creation and retention, the scheme not only enhances employability but also strengthens industry capacity, promotes selfreliance, and fosters inclusive economic growth.

2. Unorganized Workers and Social Security Measures in India

The unorganized sector is a defining feature of the Indian economy, employing over 90% of the workforce and contributing around 50% to GDP.

- Despite their economic significance, unorganized workers remain marginalized, often living below the poverty line, facing exploitation, gender discrimination, and poor working conditions.



Classification of Unorganized Workers

The Ministry of Labor categorizes unorganized workers into four groups:

- Occupational: Agricultural laborers, small/marginal farmers, fishermen, beedi rollers, artisans, construction and brick workers, etc.
- Nature of Employment: Casual, migrant, contract, bonded laborers.
- Distressed Categories: Toddy tappers, scavengers, headload carriers, animal-driven transport workers.
- Service Categories: Domestic workers, midwives, barbers, vendors.

The National Commission on Labor (1969) defines unorganized workers as those unable to organize due to irregular employment, illiteracy, marginal establishments, and dispersed workplaces.

Challenges Faced by Unorganised Workers

- Low Wages: No equal pay, bonuses, or fringe benefits; widespread exploitation.

- Lack of Job Security: Casual, temporary, and seasonal work; absence of provident fund, pension, maternity or bonus provisions.
- Weak Legal Protection: Vulnerable to harassment, unsafe conditions, and discrimination.
- Deprivation of Basic Amenities: Poor sanitation, inadequate housing, lack of education and nutrition.
- Poverty and Indebtedness: Low earnings and lack of capital hinder entrepreneurship.

Legislative Measures

- Unorganized Workers' Social Security Act, 2008 – Provides a legal framework for social security for informal workers.
- Code on Social Security, 2020 – Consolidates multiple labor laws; extends coverage to unorganized, gig, and platform workers.
- Labor Code Provisions – Focus on improving conditions, benefits, and welfare of informal workers.

Major Social Security Schemes

Life and Disability Coverage

- PMJJBY & PMSBY: Life and accident insurance; over 23.6 crore enrolled as of April 2025.

Retirement Security

- Atal Pension Yojana (APY): Encourages voluntary savings; over 7.65 crore subscribers with 48% women participation.
- PM Shram Yogi Maan-Dhan (PM-SYM): Monthly pension of Rs. 3,000 for unorganised workers earning ≤ Rs. 15,000/month; 30.51 crore enrolled.

Health and Maternity Benefits

- Ayushman Bharat–PMJAY: Health insurance up to Rs. 5 lakh per family; covers senior citizens, ASHAs, and Anganwadi workers.

Livelihood Support

- PM SVANidhi Yojana: Loans up to Rs. 30,000 for street vendors; over 68 lakh beneficiaries.
- Self-Employment Scheme for Rehabilitation of Manual Scavengers: Cash assistance, skill training, and monthly stipend.

Food Security

- Public Distribution System (PDS) & PM Garib Kalyan Anna Yojana: One Nation One Ration Card (ONORC) enables food grain access for migrants; 81 crore beneficiaries.

Artisan Support

- PM Vishwakarma Yojana: Financial and skill-building assistance; 2.37 million artisans registered.

Progress and Impact

- Social protection coverage doubled from 24.4% (2021) to 48.8% (2024), covering 920 million people (ILO World Social Protection Report 2024–26).
- Digitisation of schemes (PMJJBY, PMSBY, APY, PM-SYM) ensures ease of enrolment, claim settlement, and transparency.
- Gender inclusivity: Over 53% of E-Shram registrations are women.
- Financial inclusion, poverty alleviation, and formalisation of unorganised workforce are key outcomes.

Way Forward

To enhance the social security ecosystem for unorganised workers, strategic measures include:

- Universal registration linked to Aadhaar for identification and benefits delivery.
- Portable benefits to ensure coverage across jobs and locations.
- Simplified contribution mechanisms for irregular incomes.
- Public awareness campaigns to educate workers about entitlements.
- Multi-stakeholder funding models involving employers, workers, and government.

3. Green Technology for Sustainable Rural Jobs in India

India's push towards a clean and green economy is generating significant employment opportunities, especially in rural areas. Green technologies are not only addressing environmental concerns but also creating sustainable livelihoods.

Renewable Energy and Rural Employment

- India employed 1.1 million people in renewable energy (2025), ranking 4th globally.
- Key sectors include hydropower, solar PV, wind, biomass, biofuels, and emerging technologies like green hydrogen.
- Major initiatives:National Green Hydrogen Mission, PM-KUSUM, PM Surya Ghar, and Production Linked Incentives (PLI) for solar PV modules.
- Decentralised solutions like solar microgrids, solar-powered irrigation pumps, and bioenergy projects generate local employment and reduce rural migration.
- Skill development programs (e.g., Suryamitra, Vayumitra, Jal-Urjamitra) train youth, including women and marginalized communities, in renewable energy installation, operation, maintenance, and entrepreneurship.
- Employment potential: Solar 1 million FTE jobs, Wind ~183,500 FTE jobs, PM-KUSUM alone can create 7.55 lakh job-years.

Circular Economy and Waste Management

- Under Mission LiFE, India promotes reduce, reuse, recycle principles to turn waste into economic opportunities.
- Priority waste streams: solid waste, plastic, e-waste, battery, used oil, tyres, end-of-life vehicles, metal scrap, construction & demolition waste, hazardous waste.
- Advanced solutions like waste-to-energy plants, plastic-to-fuel conversion, e-waste recycling can be adapted in rural areas.
- Potential: 33 lakh additional jobs across skill levels in collection, segregation, recycling, and microenterprises.
- Regulatory support through Extended Producer Responsibility (EPR) framework ensures proper waste management and integration of informal sectors.

Green Healthcare in Rural Areas

- Healthcare sector growth: 7–10% annually, with rural areas facing a shortage of 2.7 million professionals.
- Green-tech solutions: solar-powered health centres, telemedicine, mobile clinics, AI diagnostics, providing local employment in operations, maintenance, and digital health services.
- Benefits: enhanced healthcare access, rural job creation, reduced migration, and improved productivity.
- Employment impact: expanding health workforce could generate 5.4 million additional jobs (2021– 25), contributing Rs. 3,429 billion annually to national income.

Skill Development Ecosystem

- Skill Council for Green Jobs (SCGJ) and Sector Skill Councils align training with market needs.
- SCGJ initiatives: 44 nationally approved qualifications, 500,000 trained candidates, including 100,000 in solar and renewable domains.
- State-level collaborations (e.g., Andhra Pradesh with Schneider Electric) equip youth with modern skills in automation, solar systems, AI, and machine learning.
- Focus: empower rural youth, women, and marginalized communities for green employment.

Green MSMEs and Smart Manufacturing

- MSMEs constitute 90% of manufacturing, key for sustainable industrial growth.
- Smart manufacturing integrates automation, analytics, data-driven decision-making, and ecoconscious production.
- Government initiatives: National Manufacturing Mission, Skill India Digital Hub, National Apprenticeship Promotion Scheme.
- Opportunities in clean-tech production, recycling, refurbishment, and repair sectors.
- Example: recycling 10,000 tonnes of waste generates ~115 jobs, highlighting circular economy employment potential.

Eco-Conscious Tourism

- Eco-tourism, rural tourism, wellness tourism generate direct and indirect employment in hospitality, guiding, handicrafts, and homestays.
- Examples: Himachal Pradesh, Kerala, Araku Valley's eco-tents, Madhya Pradesh homestays.
- Skills developed: customer service, hospitality management, digital marketing—transferable across sectors.

Conclusion

- Green technologies integrate environmental protection, sustainable development, and rural employment.
- Key enablers: renewable energy, circular economy, green healthcare, skill development, MSMEs, eco-tourism.
- Challenges: skill gaps, financing, infrastructure, regulatory complexities, but government initiatives and PPP models are bridging these gaps.
- India's green transition is not only an environmental imperative but also a people's movement, fostering inclusive growth, resilient rural economies, and global leadership in sustainability.

4. Digital India and Rural Transformation

Launched in 2015, the Digital India programme aims to transform India into a knowledge-based society, ensuring inclusive growth by providing digital access, improving connectivity, promoting innovation, and delivering government services online.

Key Achievements:

Expanding Connectivity:

- BharatNet Project: Connected 2,18,000 Gram Panchayats with 6.92 lakh km optical fibre.
- 4G and 5G networks cover 99.6% of districts; rural internet users now form 55% of total users.
- National Broadband Mission 2.0, Wi-Fi hotspots, satellite internet, and fixed wireless technologies are bridging the urban-rural digital divide.

Innovation and Technology Adoption:

- Villages are embracing AI, IoT, blockchain, and digital agriculture platforms.
- Startups and e-governance initiatives (UMANG, e-Panta, e-Sahmati) provide services like crop insurance, telemedicine, and market linkages.
- Regional language content constitutes 60% of internet content, promoting inclusivity.
- Examples: Yakten (Sikkim) – digital nomad village; Akodara (Gujarat) – fully digital transactions; Harisal (Maharashtra) – smart village with White-Fi technology

Skill Development and Education:

- PMGDISHA: Trained 6.39 crore rural citizens in digital literacy.
- Online platforms (SWAYAM, PM e-Vidya, Digital India Bhashi) improve access to education and government services.
- Common Service Centres (CSCs) act as hubs for digital literacy, vocational training, and financial education.

Employment Generation:

- New jobs in IT support, BPOs, content creation, digital services, and gig economy reduce ruralurban migration.
- Women's participation in internet usage is now 47%, empowering rural women in entrepreneurship and digital employment.

Promotion of Rural Entrepreneurship:

- E-commerce and digital payments enable rural artisans, farmers, and SHGs to access national markets.
- Government schemes like Start-up India, Make in India, PLI provide credit, marketing, and technological support.
- NASSCOM Foundation trained 1 lakh rural women, resulting in 83% independent women-led rural enterprises.

Financial Inclusion and Governance:

- UPI transactions crossed 10 billion per month; 6.5 crore merchants enabled.
- Digitisation of government services (DigiLocker, Aadhaar, GST, pensions) ensures transparency and reduces corruption.
- CSCs: 78% of 5.6 lakh centres operate in villages, providing access to services and employment.

Policy Support and Vision:

- Initiatives like Digital Personal Data Protection Act, National AI Mission, National Broadband Mission provide policy clarity.

- India aims to leverage this Tech Decade to achieve a $5 trillion economy, with IT contributing 10-15% of GDP by 2025.
- Emphasis on public-private partnership, digital literacy, startup ecosystem, and skilled youth participation.

Conclusion:

Digital India has significantly transformed rural India, enhancing connectivity, promoting innovation, improving education and skills, generating employment, and fostering entrepreneurship. While challenges like the digital divide and skill gaps persist, continued efforts can make rural India an active participant in building a self-reliant, inclusive, and knowledge-based society, positioning India as a global IT and digital superpower.

5. India-UK Free Trade Agreement (FTA) and Rural Economy

On July 24, 2025, India and the UK signed a Comprehensive Economic and Trade Agreement (CETA), marking India's first major trade deal in a decade.

- The FTA aims to strengthen economic integration, enhance agri-exports, promote value addition, and generate rural employment. It also represents a strategic step for India to expand its global trade footprint post-Brexit.

Key Highlights:

- Boost to Bilateral Trade:
- Current India-UK trade: $56 billion, targeted to double by 2030.
- Duty-free access for 99% of India's exports, covering labourintensive sectors (textiles, leather, footwear, gems & jewellery, toys, marine products) and high-value sectors (engineering goods, auto components, organic chemicals).
- Special focus on inclusive growth, benefiting farmers, women, youth entrepreneurs, MSMEs, startups, and artisans.

Agriculture and Processed Food:

- Transition from volume to value in farm sector; 1,437 agricultural tariff lines (14.8% of total) and 985 processed food lines (10.1%) included.
- Expected increase in agri-exports by over 50% in three years.
- Key commodities: grapes, shrimps, onions, honey, processed foods, mango pulp, pickles, and spices.
- Preferential access benefits small and marginal farmers and promotes diversification.
- Sanitary & Phytosanitary (SPS) measures and simplified certification facilitate trade, including for e-commerce and small consignments.

Marine & Plantation Sectors:

- Marine exports (shrimp, fish, cuttlefish) to UK poised to expand; higher procurement rates benefit coastal fisherfolk and women employees in processing plants.
- Duty-free access for coffee, tea, spices, and value-added products enhances global competitiveness.

Textiles, Leather, Gems & Jewellery:

- Gems, jewellery, sports goods, and furniture gain easier access to UK markets.
- Boosts employment in rural clusters (UP, Tamil Nadu, Gujarat, Punjab).

Inclusive Rural Development:

- FTA aligns with India's agri-export institutions (APEDA, MPEDA, Coffee & Spices Boards).
- Encourages quality production, packaging, certification, and sustainable practices.
- Ensures benefits reach small farmers, food producer organizations (FPOs), MSMEs, and rural artisans.

Conclusion

The India-UK FTA is a transformative milestone for India's rural economy, particularly agriculture, marine, and labor-intensive sectors. By providing duty-free access, promoting value-added exports, and supporting inclusive growth, the FTA strengthens rural prosperity, incentivizes quality production, and enhances India's competitiveness in global markets. It positions India to leverage its agrarian strengths, MSMEs, and rural workforce in building a sustainable and globally integrated economy.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