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ALL INDIA TIGER ESTIMATION

On Global Tiger Day 2025, the Ministry of Environment, Forest and Climate Change released the report "Status of Small Cats in Tiger Landscapes of India"

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INSIDE

GENERAL STUDIES – 1

Topics: Women and women related issues.

INDIA'S GENDER GAP: CHALLENGES AND THE WAY FORWARD

Context:

India ranked 131 out of 148 countries in the Global Gender Gap Report 2025 released by the World Economic Forum (WEF), reflecting widening disparities in economic participation and women's health.

About India's Gender Gap: Challenges and the Way Forward:

About the Global Gender Gap Report 2025:

- **Published by**: World Economic Forum (WEF)
- **Objective:** Measures gender parity across **4 dimensions** — Economic Participation, Educational Attainment, Health & Survival, and Political Empowerment.
- **Global Trend:** World has closed **68.8% of the gender gap**, but full parity will take **123 years** at the current pace.
- **India's Rank:131st**, with **low parity in economic and health indicators** despite educational improvements.

Key Issues Highlighted in India's Ranking:

- **Economic Participation:** India ranks **143rd**, with women earning less than **one-third** of men and **FLFP under 25%**.

  E.g. McKinsey (2015) estimated India could add $770 bn to GDP by closing gender gaps.
- **Health & Survival:** Poor sex ratio and high anaemia rates reflect **deep-seated son preference** and **reproductive health neglect**.

  E.g.NFHS-5 shows 57% women aged 15–49 are anaemic.
- **Unpaid Care Work:** Women perform **7x more domestic work** than men (Time Use Survey), yet it remains **invisible in GDP accounting**.
- **Leadership Gap:** Women underrepresented in **boardrooms, judiciary, and legislature**, limiting inclusive decision-making.
- **Policy Blind Spots:** Gender budgeting, social protections, and care infrastructure **remain fragmented** or underfunded.

Consequences of Gender Inequality in India:

- **Economic Underutilisation:** Excluding women from the formal workforce wastes over **50% of India's productive human capital**, slowing GDP growth.

  E.g. McKinsey projected $770 bn GDP gain if gender gaps are closed.
- **Demographic Strain:**With rising elderly population and declining fertility, low female participation raises the **dependency ratio**, straining fiscal resources.
- **Health Productivity Deficit:**Poor reproductive health and high anaemia rates reduce women's learning, work ability, and **intergenerational health outcomes**.

  E.g. 57% of women aged 15–49 are anaemic (NFHS-5).
- **Policy Blind Spots:**Low female presence in decision-making leads to **underinvestment in care economy**, health, and safety infrastructure.
- **Intergenerational Inequality Trap:**Girls growing up in inequitable systems face **limited education, poor nutrition, and fewer opportunities**, perpetuating poverty cycles.

Way Forward:

- **Invest in Women's Health:** Prioritise reproductive health, nutrition, and preventive care via public health funding.
- **Formalise Care Economy:** Develop childcare, elderly care, and maternity benefits to reduce unpaid work burden.

  E.g. Uruguay's National Care System model.
- **Enhance Labour Inclusion:** Offer skill training, flexible work, and equal pay enforcement to boost female labour force participation.
- **Institutional Reforms:** Integrate **Time Use Surveys**, gender budgeting, and targeted welfare schemes at central and state levels.
- **Change Social Norms:** Launch campaigns and media narratives to challenge patriarchal stereotypes and workplace bias.

Conclusion:

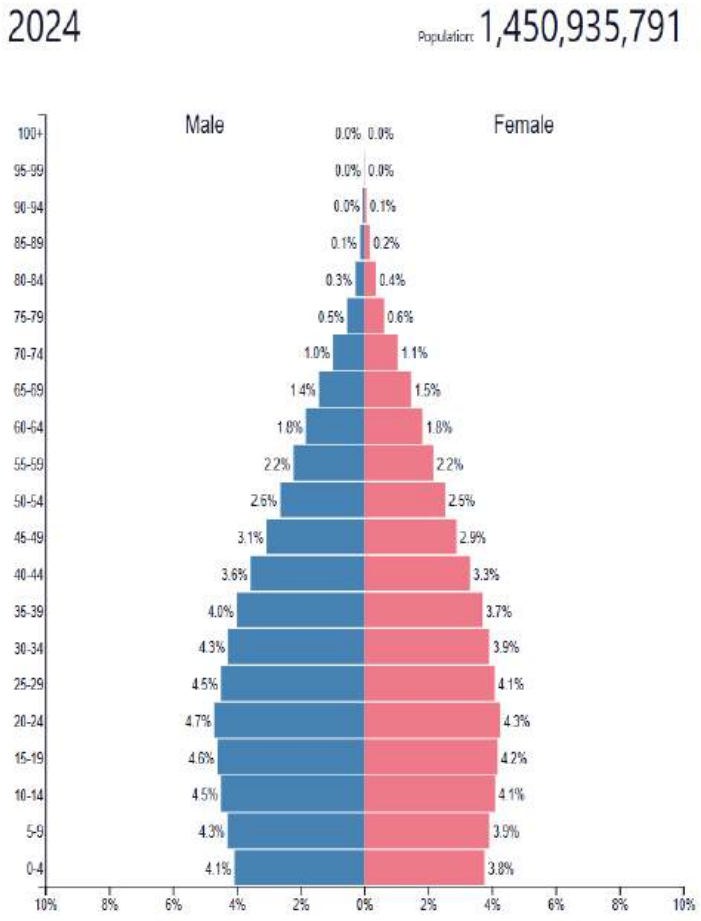
The Global Gender Gap Report is more than a global scoreboard — it's a **wake-up call** for India to realign economic, demographic, and social priorities. Without integrating women fully into the development model, India risks forfeiting its demographic dividend and growth potential. Gender equality must now be seen not only as a right — but a national economic strategy.

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

HEALTHY AGEING IN INDIA

Context:

IISc Bengaluru launched the BHARAT study to establish India-specific biomarkers for healthy ageing.It aims to bridge gaps in diagnostics caused by Western-centric health data.



About Healthy Ageing in India:

What is Healthy Ageing?

Healthy ageing refers to maintaining physical, mental, and functional well-being in older age.It emphasizes quality of life, not just longer life. Biological age often differs from chronologicalage.

- Ageing is a continuous process marked by molecular and cellular changes like telomere shortening. Factors like early-life infections, pollution, and social support shape how one ages.
- **E.g.,** a 60-year-old may have the organ health of a 75-year-old.

Data & Statistics on Ageing in India:

- **Rising Elderly Population**: By 2050, 20% of Indians (319 million) will be 60+ years. (UNFPA India)
- **Disease Burden:** Parkinson's disease in India projected to rise by 168%, dementia by 200%. (Lancet, 2024)
- **Gender Disparities:** Women outlive men but face higher disability-adjusted life years (DALYs).
- **Economic Impact:** Increasing elder dependency ratio burdens healthcare and pensions. E.g., NSSO 75th round shows only 28% of elderly have any formal pension.
- **Healthcare Gaps:** Geriatric services are limited in PHCs and district hospitals. E.g., Less than 5% PHCs have geriatric OPD services (MoHFW survey).

Features of Healthy Ageing:

- **Functional Ability:** Maintain ADLs (activities of daily living) like cooking, walking, bathing.
- **Resilience to Stress:** Quick recovery from illness or physiological stress like surgeries.
- **Mental Wellbeing:** Absence of depression, social isolation, and cognitive decline.
- **Preventive Biomarkers:** Use indicators like CRP, HDL, or metabolite levels to detect sub-clinical ageing.
- **Contextual Health Standards:** Culturally and biologically adapted parameters.

Why India Needs Focus on Healthy Ageing?

- **Rapid Demographic Transition**: Ageing rate in India is faster than in many OECD countries.

  E.g., Elderly dependency projected to rise to 35% in Kerala.
- **Mismatched Diagnostics:** Western lab values don't reflect Indian genetics and nutrition.

  E.g., B12 "deficiency" is common due to vegetarian diet, but may not indicate pathology.
- **Social Security Void:** Only a fraction of elderly receive pensions or health insurance.

  E.g., Indira Gandhi Old Age Pension Scheme covers <20% of aged poor.
- **Rural-Urban Gaps:** Rural elders lack access to health services, transport, and social care.

  E.g., Tamil Nadu's geriatric wards are concentrated in urban zones.
- **Intergenerational Strain:** Shrinking family size reduces traditional care structures.

  E.g., Increase in elder homes in Maharashtra and Karnataka.

Challenges in Ensuring Healthy Ageing:

- **Data Scarcity:** Lack of Indian-specific longitudinal data on biomarkers and ageing.

  E.g., Most data come from Western cohorts like Framingham or NHANES.
- **Cultural Resistance:** Elders often distrust hospitals, AI-based tools, or early screening.

  E.g., Refusal to undergo cancer screening in elderly from tribal belts.
- **Financial Constraints:**Geriatric healthcare gets low budget priority.

E.g., NHM lacks a dedicated ageing component despite NPHCE.

- **Sampling Bias:** Collecting data from healthy elders is difficult due to pre-existing illness.

  E.g., BHARAT study flagged challenge of finding non-comorbid samples.
- **Environmental & Nutritional Burdens:** Early-life infections and malnutrition affect ageing trajectories.

  E.g., High childhood undernutrition leads to early-onset diabetes in adults.

Initiatives Taken:

- **BHARAT Study by IISc**: Builds India's first bio-bank of ageing indicators across domains.
- **National Programme for Health Care of Elderly (NPHCE):** Focus on geriatric clinics and home care.
- **Longitudinal Ageing Study of India (LASI):** Tracks elder health, social trends, and functional abilities.
- **Senior Citizen Health Insurance (RSBY, AB PM-JAY):** Includes coverage for common elder illnesses.
- **Geriatric Courses under AYUSH & MBBS:** Introduced geriatrics as a super-specialty and PG subject.

Way Ahead:

- **Create India-Specific Health Benchmarks:** Adjust CRP, HDL, B12, and BP cut-offs to Indian baselines.
- **Expand BHARAT Nationally:** Cover all ecological, ethnic, and dietary zones in India.
- **Use AI for Predictive Diagnostics:** Model ageing patterns and organ decline early. E.g., Liver or kidney age prediction for better intervention timing.
- **Geriatric Literacy Campaigns:** Sensitize public about healthy ageing practices. E.g., Campaigns via ASHA/Anganwadi workers.
- **Convergence with NDHM:** Integrate elderly biometric and clinical data into Ayushman Bharat Digital Mission.

Conclusion:

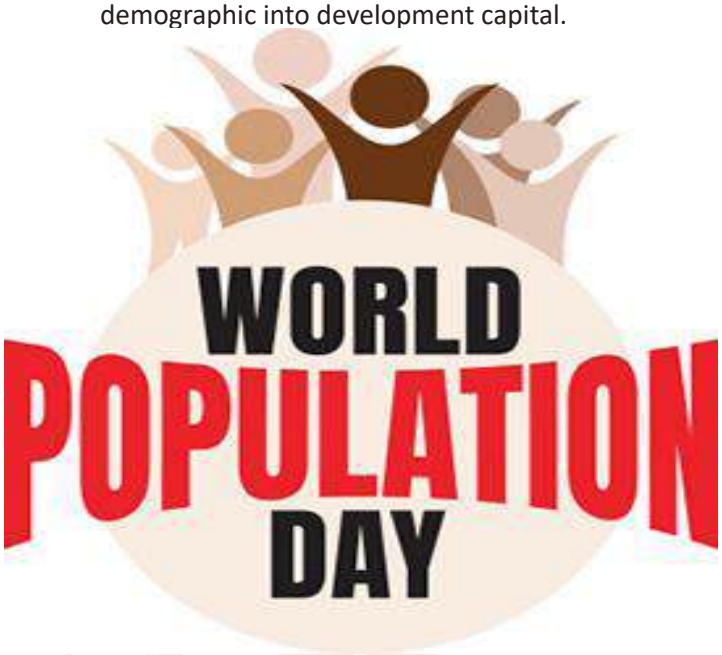
India's rapidly ageing population demands urgent attention to context-specific, data-backed health interventions. Initiatives like the BHARAT Study are timely steps toward achieving functional longevity rather than just extended life expectancy. Investing in preventive elder care today ensures a healthier, more productive ageing population tomorrow.

EMPOWERING INDIA'S YOUTH

Context:

The **UN's World Population Day 2025** theme focuses on empowering young people to create the families they want, highlighting the need to center youth voices in population policies.

- India, with the **largest youth population globally**, stands at a crucial moment to convert this demographic into development capital.



About Empowering India's Youth:

India's Demographic Potential:

- **Largest Youth Cohort Globally:**India has **371 million youth (aged 15–29)**, the highest in the world (UNICEF), offering a unique edge in the global workforce.
- **Demographic Dividend Window:**India's **demographic dividend (2005–2055)** provides a critical window to leverage its young workforce for productivity-led growth.
- **Economic Boost Potential:**Strategic investment in **education, healthcare, skilling, and employment** can unlock a **$1 trillion GDP boost by 2030** (World Bank & NITI Aayog).
- **Labour Market Advantage:**India's young working-age population provides a counterbalance to ageing societies like Japan and Europe, enhancing its **outsourcing and manufacturing competitiveness**.
- **Urbanisation& Innovation Driver:**A young demographic fuels **entrepreneurship, digital adoption, and urban transformation**, crucial for India's leap towards a knowledge-based economy.

Challenges Hindering Demographic Gains:

- **Limited Reproductive Autonomy:**NFHS-5 shows **36% face unintended pregnancies**, while **30% report unmet fertility aspirations**, indicating lack of informed choice.
- **Child Marriage & Teenage Pregnancies:**Despite a 50% drop since 2006, **23.3% girls still marry before 18**; teenage pregnancies remain **high at 7%**, with regional disparities.
- **Gender Inequality in Employment:**India's **female labour force participation rate is below 25%**, curbing economic independence and delaying empowerment.

- **Socio-cultural Barriers:**Deep-rooted gender norms, stigma around SRHR (sexual and reproductive health and rights), and poor awareness limit youth agency.
- **Poor Access to Services:**Access to **contraception, maternal care, and SRHR education** remains uneven, especially in rural and underserved areas.

Key Government and Civil Society Initiatives:

- **Project Udaan (Rajasthan, IPE Global):**
  - Prevented **30,000 child marriages** and **15,000 teen pregnancies** through schooling incentives and contraceptive access (2017–2022).
- **Project Advika (Odisha, UNICEF-UNFPA):**
  - Enabled **11,000 child marriage-free villages** and stopped **950 child marriages in 2022** via youth-led awareness and leadership training.
- **Project Manzil (Rajasthan):**
  - Trained **28,000 young women (18–21 years)** in government centres; **16,000 gained employments**, delaying early marriages and boosting financial agency.
- **Beti Bachao Beti Padhao andNational Adolescent Health Programme:**
  - Focus on reducing adolescent fertility and enhancing awareness of reproductive rights.

Way Forward:

- **Ensure Rights-Based SRHR Access:**Universalise access to contraceptives, safe abortion, infertility care, and mental health support.
- **Expand Girls' Education:**Each **additional year of secondary education reduces child marriage probability by 6%** (UNICEF).
- **Focus on Skill & Job Alignment:**Adopt human-centred design in skilling programs; ensure access to dignified, gender-friendly jobs to raise female workforce participation.
- **Invest in Structural Support Systems:**Improve access to **housing, childcare, workplace flexibility**, and **transport safety** to enable youth aspirations.
- **Behavioral Change Campaigns:**Target social norms through **community engagement**, media, and school-based life skills education.
- **Decentralised Implementation:**Encourage state-led innovations and support **district-level planning** based on local data and youth profiles

Conclusion:

India's development hinges on how it treats its youth—not merely as numbers but as agents of change. Empowering young people with **information, skills, and economic agency** will convert population pressure into national progress. Ensuring **choice, control, and capital** for every adolescent, especially girls, is the most sustainable investment in India's future.

STATE OF INEQUALITY IN INDIA

Context:

A recent World Bank report claims that India has one of the lowest inequality levels globally, citing a fall in the Gini coefficient of consumption inequality from 0.288 (2011-12) to 0.255 (2022-23).

- However, multiple studies, including the World Inequality Database, contradict this, pointing to rising income and wealth inequality in India.

Table 1: Gini coefficients for income and wealth in India

Year	Gini Pre-tax income	Gini wealth	Year	Gini Pre-tax income	Gini wealth
2000	0.47	0.7	2012	0.6	0.74
2001	0.48	0.71	2013	0.6	0.74
2002	0.49	0.71	2014	0.61	0.74
2003	0.5	0.71	2015	0.61	0.75
2004	0.51	0.71	2016	0.62	0.75
2005	0.52	0.71	2017	0.63	0.75
2006	0.53	0.73	2018	0.62	0.74
2007	0.55	0.74	2019	0.61	0.74
2008	0.56	0.74	2020	0.6	0.73
2009	0.57	0.73	2021	0.6	0.75
2010	0.58	0.74	2022	0.61	0.75
2011	0.59	0.75	2023	0.61	0.75

1 The low Gini coefficient mentioned by the World Bank relates to consumption inequality, and cannot be compared to levels of income and wealth inequality worldwide

2 Researchers at the World Inequality Database have analysed several sources of data, including national-level surveys, tax records, and published lists of the extremely rich in India, estimating more accurate indicators of inequality

About State of Inequality in India:

Understanding the Types of Inequality:

1. **Consumption Inequality:**
   - Measures differences in **spending patterns** across households.
   - Reported low by World Bank, but generally **understates actual inequality**.
   - India's falling Gini here may **reflect greater consumption smoothing**, not real income redistribution.
2. **Income Inequality:**
   - Refers to disparities in **earnings and wages** across individuals or households.
   - **Gini coefficient for income in India (WID 2023): 0.61**, among the **highest globally** (only 47 countries are more unequal).
   - Significantly higher than official estimates due to underreporting in household surveys.
3. **Wealth Inequality:**
   - Captures concentration of **asset ownership**, like property, shares, or savings.
   - India's **wealth Gini: 0.75** in 2023 (WID), showing **extreme wealth concentration**.

Calculating Real Inequality Is Difficult in India:

- **Survey Limitations:**
  - **Household Consumption Expenditure Surveys (HCES)** miss high-income earners

and under-report savings and property.
    - **Methodological differences** between 2011–12 and 2022–23 surveys hinder time-series comparison.
- **Tax Data Exclusion: Only 6 crore individuals** file income tax (CBDT data), leaving out vast informal income sources.
- **Lack of Wealth Census:** India has **no systematic wealth census**—data is derived from proxies like Forbes lists, SEBI filings, and real estate prices.
- **Underestimation Bias:** Richest individuals tend to **under-report**, and top wealth segments are **statistically invisible** in sample surveys.

Limitations of the Gini Coefficient:

- **Aggregate measure**—hides the intensity of concentration.
- Does **not show wealth held by top 0.1% or bottom 50%**.
- Needs to be supplemented with Top 1% wealth share, P90/P10 ratios, or Theil index.

Implications of High Inequality for India:

- **Reduced Economic Mobility:** Limits upward movement for bottom 50% of population.
- **Lower Aggregate Demand:** Savings of the rich do not translate into proportional spending.
- **Social Fragmentation:** Fuels resentment, political polarisation, and unrest.
- **Distorted Policy Outcomes:** Excess influence of elite groups on taxation, subsidies, and land use.
- **Skewed Growth Patterns:** Benefits of GDP growth accrue disproportionately to top 10%.

Constitutional and Policy Context:

- **Article 38(2):** Mandates state to minimize inequalities in income and opportunities.
- **DPSP Article 39(c):** Prevents concentration of wealth and means of production.
- **Schemes:**MGNREGA, PM-SVANidhi, PM-KISAN, JAM Trinity—aim to reduce inequality but suffer from poor targeting and leakage.

Way Ahead:

- **Progressive Taxation:** Reintroduce wealth and inheritance taxes on ultra-rich to reduce concentration and expand fiscal space.
- **Universal Public Services:** Increase public investment in health, education, and nutrition to equalize life opportunities.
- **Formal Financial Access:** Expand low-cost credit access and borrower safeguards to reduce dependence on informal lenders.
- **Skilling & Jobs:** Align skilling with market demand and promote job-rich sectors to uplift lower-income groups.
- **Better Data:** Integrate tax, survey, and asset records to publish accurate inequality metrics beyond consumption data.

Conclusion:

Addressing inequality is essential not just for social justice but for sustaining long-term economic growth. India's structural disparities demand bold reforms in taxation, public provisioning, and data transparency. Only inclusive development can ensure equitable prosperity in the decades ahead.

Topics: Social empowerment, communalism, regionalism & secularism

DANGERS OF REGIONALISM

Context:

The Supreme Court of India stated that promoting regionalism for electoral gain is as dangerous as communalism, warning against political parties inciting regional divisions that threaten national unity.

About Dangers of Regionalism:

What is Regionalism?

- **Regionalism** refers to loyalty or political movement prioritizing a region's interests over national integration.
- It can turn divisive when used for **vote-bank politics**, undermining unity and constitutional values.

Types and Manifestations:

1. **Demand for Autonomy:** Eg. Gorkhaland or Bodoland movements.
2. **Sub-regional Identity Politics:** Maharashtra's "sons of the soil" campaigns.
3. **Developmental Disparities:** Backward region movements in Telangana, Vidarbha.
4. **Language-Based Politics:** Anti-Hindi agitations in Tamil Nadu.
5. **Employment Preferences:** Local job reservations, e.g., Haryana 75% private jobs for locals.

Factors Causing Rise in Regionalism:

- **Uneven Development:** Lopsided industrial or social growth breeds resentment.

  E.g. Bihar & Jharkhand disparities fueled statehood demands.

- **Cultural Assertion:** Communities fear cultural extinction due to migration or central policies.

  E.g. Marathi vs. North Indian tension in Mumbai.

- **Electoral Mobilization:** Political parties fuel regional identity for electoral advantage.

  E.g. Shiv Sena's early campaigns or AIMIM's region-targeted strategies.

- **Linguistic Politics:** Language often becomes a tool of exclusion or chauvinism.

  E.g. Dravidian movement's roots in linguistic pride.

- **Neglected Grievances:** Genuine local issues ignored by the Centre or state trigger separatist sentiments.

  E.g. Jammu & Kashmir before Article 370 abrogation.

Issues Associated with Regionalism:

- **Threat to National Unity:** Encourages fragmentation and undermines the idea of India as one nation.
- **Discrimination & Violence:** Migrants face hostility—*e.g., Bihari workers in Assam or Gujarat*.
- **Undermines Constitutional Rights:** Violates Article 19 – right to reside, settle, or work anywhere.
- **Obstructs National Policies:** Regional opposition may stall centrally important infrastructure or reforms.
- **Encourages Populism over Governance:** Identity politics diverts focus from inclusive development.

Way Forward:

- **Constitutional Literacy:** Promote awareness about fundamental duties and Article 19 protections.
- **Balanced Development:** Address regional disparities through equitable fiscal allocation.
- **National Integration Programs:** Strengthen Ek Bharat Shreshtha Bharat, youth exchanges, and civil society dialogues.
- **Political Accountability:** EC should scrutinize manifestos and speeches for regional or communal polarisation.
- **Judicial Vigilance:** Courts must continue to check unconstitutional political behaviour and uphold secularism.
- **Promotion of Plural Nationalism:** Accepting regional identities as part of Indian mosaic, not opposition to it.

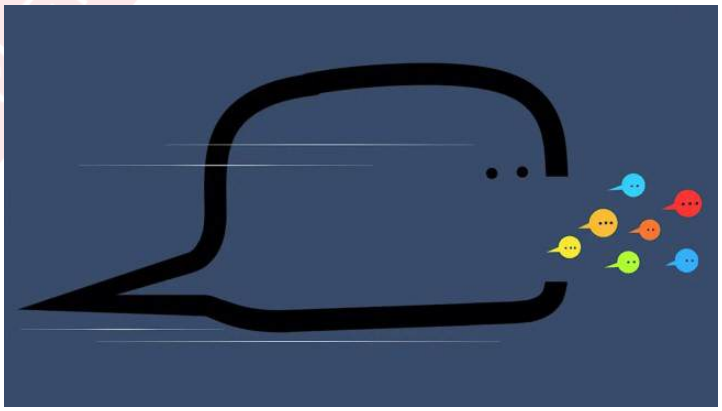
Conclusion:

Regional aspirations must not override national unity. The Supreme Court's timely warning calls for mature politics rooted in constitutional values. True federalism thrives not through parochialism but through **cooperative nationalism**, where diversity strengthens unity.

LANGUAGE AND IDENTITY

Context:

A renewed debate on language, identity, and migration has emerged in Bengaluru and Mumbai after attacks on migrant workers and concerns over linguistic imposition by regional outfits, sparking conversations on local integration vs elite detachment.



About Language and Identity:

What Is Local Language and Culture?

- A *local language* reflects the **social memory, oral tradition, and lived identity** of a region's people.
- Culture and language are intertwined—**language encodes collective wisdom**, myths, values, and customs.

Factors Shaping Local Language:

- **Geography:** Influences dialects and idioms (e.g., coastal Marathi vs interior Vidarbha Marathi).
- **Migration & History:** Cities like Bengaluru evolved linguistically due to tech-driven migrant influx.
- **Elite Usage:** In Kolkata, continued use of Bangla across social strata helps maintain linguistic vitality.

Language as a Connector of Communities:

- **Facilitates social bonding:** Knowing local language builds emotional rapport with native residents.
- **Improves job access:** Auto drivers, domestic help, or retail staff with local language fluency fare better in cities.
- **Fosters civic engagement:** Understanding notices, laws, and schemes in native language boosts participation.
- **Empowers migrant inclusion:** Migrants learning Kannada/Tamil gain identity beyond labour roles.
- **Strengthens national unity:** Respecting linguistic plurality reinforces federalism and pluralism.

Language as an Isolator of Communities:

- **Reinforces class bubbles:** Elite residents bypass local life entirely, using English within gated setups.
- **Devalues regional identity:** Local languages seen as "non-utility" by privileged classes weakens cultural pride.
- **Excludes from services:** Monolingual services (like in hospitals or ration shops) alienate non-speakers.
- **Fuels local resentment:** Migrants seen as "outsiders" if they resist linguistic adaptation.
- **Blocks mutual empathy:** Absence of language-sharing fosters stereotyping and suspicion between groups.

Other Functions of Language:

- **Economic function:** Knowledge of local language enhances entrepreneurial and business outreach.
- **Political mobilisation:** Parties like DMK or MNS use language to invoke regional pride and assert identity.
- **Emotional anchoring:** Native tongues act as emotional refuge during crises or personal milestones.
- **Cognitive development:** Studies show multilingual children have higher problem-solving and empathy levels.

Significance of the Language:

- **Upholds constitutional diversity:** India officially recognizes 22 languages under the Eighth Schedule.
- **Bridges social divides:** Language literacy fosters shared festivals, values, and civil harmony.
- **Promotes inclusive urbanization:** Language-aware planning avoids conflict and enhances social integration.
- **Reveals cultural power dynamics:** Dominance of English/Hindi exposes deeper inequalities in urban society.

Conclusion:

Language is more than grammar—it is a **vehicle of belonging and dignity**. True pluralism lies in **learning without compulsion** and **preserving without exclusion**. A just city welcomes all tongues while nurturing its own.

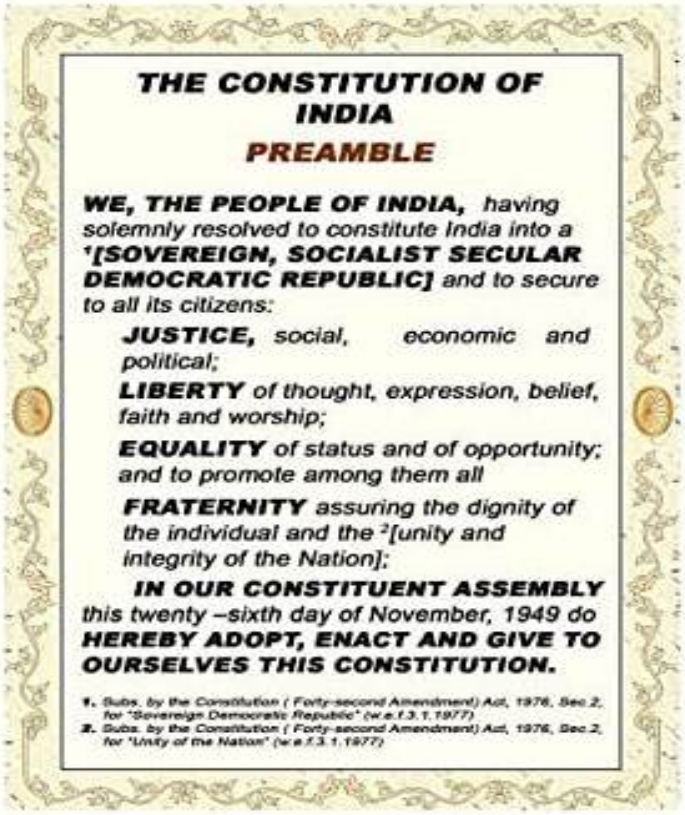
GENERAL STUDIES – 2

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

SOCIALIST AND SECULAR IN INDIA'S PREAMBLE

Context:

Recent statements by political leaders from the ruling alliance have reignited the debate on removing the words "Socialist" and "Secular" from the Preamble, originally added through the 42nd Constitutional Amendment during the Emergency.


THE CONSTITUTION OF INDIA

PREAMBLE

WE, THE PEOPLE OF INDIA, having solemnly resolved to constitute India into a [1][SOVEREIGN, SOCIALIST SECULAR DEMOCRATIC REPUBLIC] and to secure to all its citizens:

JUSTICE, social, economic and political;

LIBERTY of thought, expression, belief, faith and worship;

EQUALITY of status and of opportunity; and to promote among them all

FRATERNITY assuring the dignity of the individual and the [2][unity and integrity of the Nation];

IN OUR CONSTITUENT ASSEMBLY this twenty –sixth day of November, 1949 do HEREBY ADOPT, ENACT AND GIVE TO OURSELVES THIS CONSTITUTION.

1. Subs. by the Constitution (Forty-second Amendment) Act, 1976, Sec 2, for "Sovereign Democratic Republic" (w.e.f.3.1.1977)
2. Subs. by the Constitution (Forty-second Amendment) Act, 1976, Sec 2, for "Unity of the Nation" (w.e.f.3.1.1977)

About Socialist and Secular in India's Preamble:

What is the Preamble?

- **Definition:** The Preamble is the **introductory statement** to the Constitution that outlines its **objectives and guiding philosophy**.
- **Origin:** Drafted under the leadership of **Dr. B.R. Ambedkar**, it was adopted on **26 November 1949**.
- **Legal Status:** Though not legally enforceable, it is used as a tool for **constitutional interpretation**.
- **Features of the Preamble:**
  - Declares India as a **Sovereign, Socialist, Secular, Democratic Republic.**
  - Ensures **Justice (social, economic, political), Liberty, Equality**, and **Fraternity**.
  - Reflects the **aspirations of the people** and the **core values of the Constitution**.

What is the Issue Now?

- **Political Debate:** Calls to remove "socialist" and "secular" citing their **Emergency-era insertion**.
- **Legal Concern:** Questions raised over whether amending these terms violates the **Basic Structure Doctrine.**
- **Ideological Divide:** Critics view the move as an attempt to dilute India's **inclusive and welfare-oriented ethos**.

Meaning of "Socialist" and "Secular":

- **Socialist**: Implies commitment to **welfare policies**, **reduced inequality**, and **equitable distribution** (e.g., PM Garib Kalyan Yojana).
- **Secular**: State maintains **neutrality towards all religions** and ensures **equal rights for all faiths** (e.g., Article 25-28).

Reasons for Adding 'Socialist' and 'Secular' (42nd Amendment):

- **Clarification**: To reflect existing values already embedded in **Directive Principles.**
- **Strengthening Ideals**: Reinforce India's commitment to **inclusive development**.
- **Emergency Politics**: Intended to **reshape political narratives** during a time of centralized control.
- **Legal Backing**: Passed by **special majority**, endorsed by judiciary in **Minerva Mills (1980)**.

Can the Preamble Be Amended?

- **Arguments Supporting Amendment**
  - **Article 368**: Constitution permits amendment of any part, including the Preamble.
  - **Parliamentary Power**: 42nd Amendment itself set precedent for altering the Preamble.
  - **Democratic Evolution**: Society's values evolve; Constitution must reflect **contemporary realities**.
  - **Not Justiciable**: Preamble is not enforceable in courts, allowing flexibility.
- **Arguments Against Amendment:**
  - **Basic Structure Doctrine**: Secularism is part of Constitution's **unalterable core** (Kesavananda Bharati, 1973).
  - **Foundational Spirit:** Values like secularism were **implicitly present** since inception.
  - **Judicial Precedents:** Supreme Court in **Minerva Mills** called additions a **source of vitality**.
  - **Constituent Assembly Rejection:** B.R.

Ambedkar had rejected inclusion of ideology terms to **protect democracy**.

Key Supreme Court Cases on Preamble:

- **Kesavananda Bharati v. State of Kerala (1973)**: Declared **secularism** as part of **basic structure**.
- **Berubari Case (1960)**: Held that the Preamble is **not part of the Constitution**, but guides interpretation.
- **Minerva Mills (1980)**: Upheld the insertion of "socialist" and "secular" as **strengthening constitutional philosophy**.
- **St. Xavier's College v. Gujarat (1974)**: Stated that **secularism was inherent** even before the amendment.

Conclusion:

Tampering with the Preamble is not a matter of wording—it's a challenge to the constitutional vision of India. Secularism and socialism are not political tools but guiding lights of governance. Any attempt to dilute them must be resisted with legal, moral, and democratic firmness.

PYQ:

1. Discuss each adjective attached to the word 'Republic' in the preamble. Are they defendable in the present circumstances stances? (2016)

ABUSE OF FREE SPEECH ONLINE

Context:

The Supreme Court, while hearing two separate cases on social media content, raised concerns over the growing abuse of free speech online, urging citizens to exercise self-restraint and warning that State regulation might become inevitable.

About Abuse Of Free Speech Online:

- **What is Free Speech?**
  - It refers to the **right to express opinions** without censorship or restraint.
  - Includes verbal, written, artistic, symbolic, or digital expression.
- **Constitutional Protection**
  - Guaranteed under **Article 19(1)(a)** of the Indian Constitution.
  - Recognized as a **cornerstone of democracy** and **freedom of the press** (e.g. Romesh Thapar v. State of Madras).
- **Reasonable Restrictions – Article 19(2)**
  - Imposed in interest of **sovereignty, public order, decency, morality**, defamation, contempt of court, etc.
  - Restrictions must be **reasonable** and subject to **judicial review** (Shreya Singhal v. Union of India struck down Section 66A IT Act as vague and arbitrary).

Rise of Free Speech Abuse on Digital Platforms:

Growth of Social Media:

- India has over **800 million internet users**, with X, Instagram, and Facebook witnessing high political content volume.
- Platforms have become tools for **misinformation, hate speech, defamation**, and cyberbullying.

Forms of Misuse:

- **Objectionable Religious Posts:** Posts that insult or mock deities and religious beliefs have led to **multiple FIRs and communal tensions**.
  E.g. Wazahat Khan's post triggered national outrage and legal actions across states.
- **Defamatory Political Cartoons:** Digital caricatures often cross the line between satire and slander, eroding public discourse.
  E.g. Hemant Malviya's cartoon on Prime Minister drew strong objections and legal scrutiny.
- **Anonymity and Virality Over Public Interest:** Many users create fake or anonymous profiles to post inflammatory or defamatory content.

Implications on Indian Democracy and Society:

- **Polarisation & Hate Crimes:** Online abuse fuels real-world communal tensions and vigilantism.
  E.g. Hate speech on YouTube and X has been linked to offline violence.
- **Judicial Burden:** Rising number of **FIRs and bail petitions** adds pressure on the criminal justice system.
  E.g. SC clubs multiple FIRs in Khan's case.
- **Threat to National Unity:** Violates **Fundamental Duties** (Art. 51A) to uphold fraternity and integrity.
- **Global Image Erosion:** India's commitment to **freedom with responsibility** under scrutiny in global digital rights rankings.

Supreme Court Observations and Key Cases

1. **Wazahat Khan Case (2025):**
   - Filed plea to club FIRs for offensive religious posts.
   - Court: Citizens must value rights and not provoke religious divisions.
2. **Hemant Malviya Case (2025):**
   - Posted satirical cartoon of Prime minister&

RSS workers.
    - SC: Use of Article 19 must come with **"self-regulation and discipline."**
3. **Shreya Singhal v. Union of India (2015):**
    - Landmark judgment striking down **Section 66A IT Act,** defending digital speech while highlighting the risk of **vague laws**.

Way Ahead

- **Digital Civility Code:**Introduce voluntary citizen code of digital conduct to promote respectful dialogue.
- **Algorithmic Accountability:**Social media companies must audit content amplification models to reduce hate virality.
- **Guidelines on Horizontal Application of Rights:**Frame jurisprudence on how fundamental rights apply between private citizens, especially in digital spaces.
- **Strengthen Legal Remedies:**Update IT Act and CrPC to swiftly tackle fake news and hate, without compromising rights.
- **Public Digital Literacy Campaigns:**Focus on ethical online behaviour in schools, workplaces, and local governance systems.

Conclusion:

Freedom of speech is a sacred right under Article 19, but its misuse erodes democratic civility and public order. A balance between liberty and responsibility is the need of the hour. Citizens must self-regulate, or the State may be compelled to intervene—a situation undesirable in a liberal democracy.

OVERSEAS CITIZEN OF INDIA (OCI)

Context:

During his official visit to Trinidad and Tobago, Prime Minister announced that Indian-origin citizens up to the sixth generation in the country will now be eligible for Overseas Citizen of India (OCI) cards.

About Overseas Citizen of India (*OCI*):

- **What it is?**
    - OCI is a form of **permanent residency** provided to **foreign nationals of Indian origin**, allowing them to live, work, or travel to India without needing a visa.
- **Launched in:** August 2005, under the Citizenship (Amendment) Act, 2005
- **Administering Ministry:** Ministry of Home Affairs, Government of India
- **Objective:**
    - To connect India with its **global diaspora** by granting them long-term rights to stay and engage in India's economic and cultural life, without granting dual citizenship.
- **Eligibility (as per Section 7A of Citizenship Act, 1955)**
    - **Foreign citizens who:**
        - Were Indian citizens after **26 January 1950**
        - Were eligible for Indian citizenship on **26 January 1950**
        - Belonged to a territory that became part of India after **15 August 1947**
    - **Their:**
        - Children, grandchildren, great-grandchildren
    - **Others:**
        - Minor children with **one or both parents as Indian citizens**
        - Spouses of Indian citizens or OCI holders (if marriage has lasted 2+ years)
    - **Not Eligible**:
        - If the applicant or their ancestors were citizens of **Pakistan, Bangladesh**, or countries notified by the Indian government.
- **Key Features of OCI Card:**
    - **Multiple-entry, lifelong visa** to India.
    - **No police reporting** even for extended stays.
    - **Employment rights** without needing a visa.
    - **Parity with NRIs** in education, finance, housing, and property (except farmland).
    - Can buy residential and commercial property in India.
    - **No dual citizenship**, but access to most rights except voting and constitutional offices.
    - **Online application and status tracking** through the OCI portal.

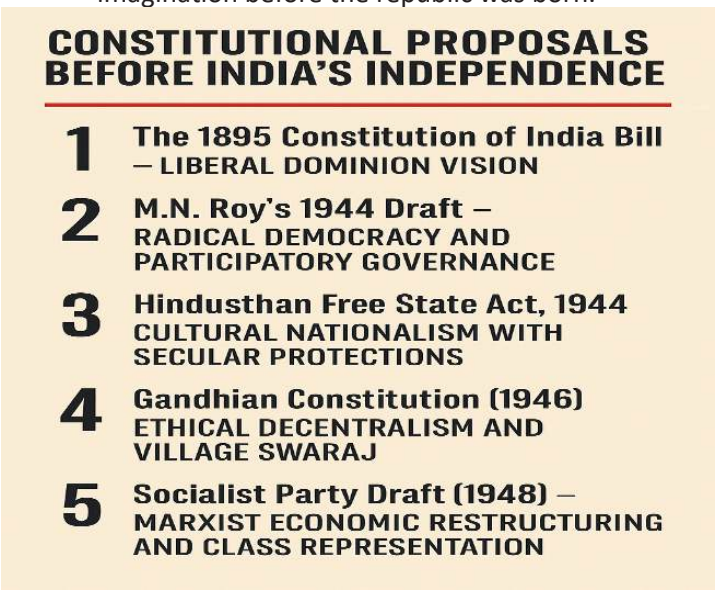
CONSTITUTIONAL DREAMS BEFORE 1950

Context:

Scholars are revisiting pre-1950 constitutional drafts like the 1895 Constitution Bill and M.N. Roy's 1944 draft, which offered alternative visions of democracy, sovereignty, and

governance.

- These documents reflect India's rich constitutional imagination before the republic was born.



About Constitutional Dreams Before 1950:

Five Key Drafts and Their Ideological Anchors:

1. **The 1895 Constitution of India Bill – Liberal Dominion Vision**
   - Drafted by early nationalists like Bal Gangadhar Tilak (attributed).
   - Proposed 110 articles, emphasizing individual rights, civil liberties, and legal equality.
   - Inspired by British constitutionalism; sought representative government within the Empire, not full independence.
   - Favoured separation of powers and rule of law, focusing on elite-led legal reform.
2. **M.N. Roy's 1944 Draft – Radical Democracy and Participatory Governance**
   - Framed under the Radical Democratic Party, based on radical humanism.
   - Introduced popular sovereignty, a robust Bill of Rights, and the right to revolt against tyranny.
   - Advocated linguistic federalism, decentralisation via citizens' committees, and direct participation.
   - Balanced civil and socio-economic rights, making them justiciable and legally binding.
3. **Hindusthan Free State Act, 1944 – Cultural Nationalism with Secular Protections**
   - Linked to Hindu Mahasabha, envisioned a unitary structure named "Hindusthan Free State."
   - Stressed national unity via one language, one law, one culture, yet guaranteed religious freedom and equality.
   - Declared no state religion, and prohibited use of public funds for religious ends.
   - Included right to secession for provinces and strong emergency powers for the state.
   - Balanced nationalist ethos with formal constitutional secularism.
4. **Gandhian Constitution (1946) – Ethical Decentralism and Village Swaraj**
   - Authored by Shriman Narayan Agarwal with a foreword by Mahatma Gandhi.
   - Proposed confederation of self-reliant village republics based on khadi, trusteeship, and non-violence.
   - Rejected industrial capitalism and legal bureaucracy, favouring moral self-governance.
   - Ironically included the right to bear arms, revealing tension between pacifism and practical self-defence.
   - Focused on duties and spiritual values over formal legal rights.
5. **Socialist Party Draft (1948) – Marxist Economic Restructuring and Class Representation**
   - Proposed by the Socialist Party under Jayaprakash Narayan.
   - Advocated nationalisation of industry, land reform, and worker-peasant control of production.
   - Suggested unicameral legislature with class-based representation.
   - Emphasized economic democracy over procedural safeguards; less detailed on judicial/administrative mechanisms.
   - Envisioned a planned economy, gender equality, and eradication of caste discrimination.

Comparative Analysis of Ideological Threads in Pre-1950 Constitutional Drafts:

India's constitutional evolution before 1950 was shaped by diverse ideological currents. Each draft reflected a unique vision of sovereignty, governance, economic justice, and civil liberties. A comparative analysis is presented below:

Locus of Sovereignty:

- **1895 Bill & Socialist Party Draft:** Both placed ultimate authority in the **legislature**, indicating a belief in representative governance through elected bodies.
- **M.N. Roy's Draft:** Shifted the locus of power to the **people**, not parliament. It introduced the **right to revolt** and **citizens' committees**, envisioning direct democracy and participatory accountability.
- **Gandhian Model:** Rooted sovereignty in **moral authority and community ethics**, focusing on **self-regulated village republics** where legitimacy came from tradition and non-violence, not formal state institutions.

Governance Style:

- **Centralised Models:**
  - **Hindusthan Free State Act:** Advocated **unitary governance**, with one law, one language, and a culturally unified state.
  - **Socialist Party Draft:** Favoured **central planning and authority**, essential for executing land reforms and nationalisation.
- **Decentralised Models:**
  - **M.N. Roy:** Proposed a **federal India**, linguistically reorganised with checks against bureaucratic centralism and direct democratic controls.
  - **Gandhian Draft:** Envisioned a **confederation of village republics** (Gram Swaraj) as the fundamental governing units, functioning independently but morally aligned.

Economic Vision:

- **Gandhian Draft:** Favoured a **minimalist, agrarian economy** based on khadi, self-sufficiency, and non-industrial livelihoods, rooted in ethical trusteeship.
- **M.N. Roy:** Advocated **democratic socialism**, supporting public control over key industries and enforceable socio-economic rights within a participatory framework.
- **Socialist Party Draft:** Took a **radical Marxist stance**, calling for the **nationalisation of land and industries**, worker control, and class-based representation.
- **1895 & Hindusthan Free State:** Largely **silent on economic redistribution**, reflecting either a legal-liberal concern (1895) or nationalist-cultural focus (Hindusthan Free State) without structural economic blueprints.

Civil Liberties and Rights Framework:

- **Strong Civil Liberties Framework:**
  - **1895 Bill:** Inspired by Western liberalism, included **freedom of speech, property, and legal equality**.
  - **M.N. Roy:** Advanced the rights discourse by including both **civil and socio-economic rights**, making them **justiciable and binding**.
- **Economic Rights First:**
  - **Socialist Draft:** Prioritised **economic democracy** and material equity over procedural civil rights; liberty was seen through the lens of class justice.
- **Ethical Duties over Legal Rights:**
  - **Gandhian Draft:** Emphasised community duties, moral conduct, and village ethics over individualistic rights, aiming for a spiritually cohesive society.
- **Balanced Approach within Nationalism:**
  - **Hindusthan Free State:** Despite its culturally majoritarian tone, it guaranteed freedom of religion, conscience, and non-discrimination, showing formal commitment to secularism within a unified national framework.

Legacy in the 1950 Constitution

Draft	Influenced Aspects in 1950 Constitution
1895	Parliamentary democracy, legal structure
M.N. Roy	Fundamental Rights, Directive Principles, decentralisation
Gandhi	Panchayati Raj, moral ethos of state
Socialist Draft	Economic Justice, Article 39 (DPSP)
Hindusthan Free State	Affirmative secularism with order clause

Conclusion:

These early drafts represented India's ideological diversity long before the Constitution was adopted. Whether it was Roy's participatory democracy, Gandhi's moral localism, or the Socialists' radical redistribution — each offered unique insights. Though the 1950 Constitution was a consensus document, it was enriched by the intellectual ferment that preceded it.

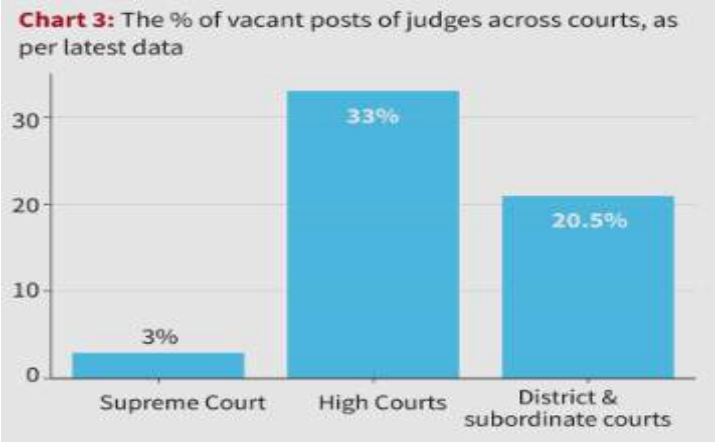
Topics: Parliament and State Legislatures – structure, functioning, conduct of business, powers & privileges and issues arising out of these.

PENDENCY IN INDIAN COURTS

Context:

India's judiciary faces a pendency crisis with over 5 crore cases across Supreme Court, High Courts, and District Courts.

- President of India previously highlighted the issue as "**Black Coat Syndrome**," indicating rising public distrust due to delayed justice.



About Pendency in Indian Courts:

Current Status

- **Pending Cases:** 4.6 crore in District Courts, 63.3 lakh in High Courts, 86,700 in Supreme Court.
- **Judicial Strength Deficit:** India operates with just 15 judges per 10 lakh population vs. Law Commission's 50.
- **Civil vs. Criminal Delay:** Only 38.7% civil cases are disposed within a year in district courts vs. 70.6% for criminal cases.
- **Vacancy Crisis:** 5,665 judge positions vacant across courts; only 79% of sanctioned strength filled.

Key Causes of Judicial Pendency

1. **Judge Vacancy Crisis:**
   - Judiciary operates at **79% capacity**.
   - 5,665 posts vacant out of 26,927 sanctioned.
   - Only **15 judges per 10 lakh population**, far below the Law Commission's 1987 norm of **50 judges per 10 lakh**.
2. **Disproportionate Civil Delays:**
   - Only **38.7%** of civil cases in district courts resolved within a year.
   - **20% stretch beyond 5 years**, mainly in property, family, or contract disputes.
3. **Lack of Timelines and Monitoring:**
   - No statutory deadlines for filings, hearings, or witness examination.
   - Frequent adjournments and fragmented case scheduling.
4. **Weak Infrastructure and Staffing:**
   - Inadequate courtrooms, administrative support, and digital tools.
   - High judge-to-case and judge-to-population ratios at the subordinate level.

Government Initiatives:

1. **e-Courts Mission Mode Project:**
   - 18,735 courts digitised; 99.4% WAN coverage; 3,240 court–jail video links.
   - Phase-III (₹7,210 crore) envisions paperless, unified judicial platform.
2. **Judicial Infrastructure Scheme:**
   - Court halls rose from 15,818 (2014) to 23,020 (2024); ₹11,167 crore invested.
3. **Appointment Reforms:**
   - 976 High Court judges and 62 Supreme Court judges appointed since 2014.
   - District judiciary strength increased to 25,609.
4. **Fast Track and Special Courts:**
   - 866 FTCs and 755 POCSO-special courts functional.
   - 2.53 lakh sensitive cases disposed.
5. **ADR Mechanisms:**
   - **Lok Adalats:** 27.5 crore cases resolved since 2021.
   - **Mediation Act, 2023:** Institutionalises pre-litigation mediation.
   - **Arbitration Acts:** Strict timelines to resolve commercial disputes.
6. **Tele-Law & Pro Bono Legal Services:**
   - 90 lakh beneficiaries via Tele-Law.
   - 11,000 pro bono lawyers under Nyaya Bandhu; legal clubs in 89 law schools.

Way Forward:

- **Judicial Capacity Expansion:**
  - **Increase sanctioned strength:** Augment judge-to-population ratio to reduce workload and ensure timely hearings.
  - **Fast-track appointments & reform collegium:** Introduce transparent and inclusive selection with timelines to fill vacancies swiftly.
- **Digital Justice Delivery:**
  - **Scale up e-courts & AI tools:** Use technology for virtual hearings, e-filing, and automated scheduling to cut delays.
  - **Implement FASTER system:** Enable real-time digital transmission of orders to reduce procedural delays in bail and urgent cases.
- **Alternate Dispute Resolution Push:**
  - **Mandatory mediation:** Make pre-litigation mediation compulsory in civil and commercial cases to avoid unnecessary trials.
  - **Train certified mediators:** Develop a national pool of skilled ADR professionals for effective and quick resolution.
- **Specialised Benches:**
  - **Create domain-specific courts:** Set up dedicated benches for environment, tax, IPR, and cyber law to improve expertise and speed.
- **Public-Centric Legal Access:**
  - **Expand legal aid tools:** Increase reach of Tele-Law, mobile clinics, and regional language judgments for rural justice access.
  - **Promote legal awareness:** Introduce legal literacy via school curriculum,

court streaming, and public engagement programs.

Conclusion:

Timely and affordable justice is central to constitutional governance. India's judicial backlog reflects deep structural challenges — but with sustained reforms, technology adoption, ADR mechanisms, and institutional transparency, the judiciary can emerge as a pillar of accessible democracy, not a symbol of delay.

Topics: Structure, organization and functioning of the Executive and the Judiciary; Ministries and Departments of the Government; pressure groups and formal/informal associations and their role in the Polity.

TV RATING GUIDELINES 2025

Context:

The Ministry of Information & Broadcasting released a draft policy on TV Rating Guidelines 2025, proposing to allow multiple agencies in the TRP ecosystem to improve accuracy, transparency, and reflect digital viewership trends.

About TV Rating Guidelines 2025:

- **What is TRP?**
  - Television Rating Point (TRP) is a **quantitative metric** used to measure the popularity and reach of television programs. It helps broadcasters, advertisers, and stakeholders assess audience engagement and plan revenues accordingly.
- **Administering Authority:**
  - Governed by the Ministry of Information & Broadcasting, Government of India.
  - Operationally handled by **Broadcast Audience Research Council (BARC)**.
- **Established:** The current regulatory framework was introduced in 2014 under the "Policy Guidelines for Television Rating Agencies in India".
- **Objective of the TRP System:**
  - To ensure transparent, scientific, and reliable measurement of TV viewership across platforms.
  - To aid content creators, advertisers, and regulators in making data-driven decisions in the media ecosystem.
- **Issues with the Existing TRP System:**
  - **Monopoly by BARC:** BARC is the only rating agency authorized, limiting innovation and competition.
  - **Limited Sample Size:** Only 58,000 meters for over 230 million TV homes—representing just 0.025%.
  - **No Measurement of Connected Devices:** Current system excludes smart TVs, OTT platforms, and mobile apps.
- **Proposed Reforms in the Draft TRP Policy 2025:**
  - **Allow Multiple Rating Agencies:** Entry barriers removed to **foster competition** and modernise the ecosystem.
  - **Modern Technology Integration:** Encourages agencies to include connected TVs, streaming apps, and mobile devices in measurement.
  - **Amendments to Restrictive Clauses:**
    - Clause 1.4 reworded to focus only on avoiding **conflict of interest**, not general consultancy bans.
    - Clauses 1.5 and 1.7 deleted to eliminate **entry barriers**.
  - **Democratising Investment:** Broadcasters and advertisers can now **invest** in rating infrastructure under regulated norms.
  - **Transparent and Inclusive Ratings:** The new system seeks to better reflect India's diverse content consumption, especially in regional and digital domains.

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

SPECIAL INTENSIVE REVISION (SIR)

Context:

The Supreme Court began hearing petitions challenging the Election Commission of India's (ECI) Special Intensive Revision (SIR) of electoral rolls in Bihar, raising constitutional and procedural concerns ahead of the upcoming assembly polls.

About Special Intensive Revision (SIR):

- **Definition:** A **Special Intensive Revision** involves **door-to-door verification** of electoral rolls through house-to-house enumeration.
- **Legal Basis:** Conducted under **Section 21(3)** of the **Representation of the People Act, 1950**, and **Article 324** of the Constitution, empowering ECI for electoral roll supervision.
- **Hybrid Nature:** Combines features of both **intensive and summary revisions**, requiring additional documentation in selected cases.

Why is Special Revision Needed?

- **Duplicate Entries:** Rapid migration, urbanisation, and dual enrolment have inflated electoral rolls (ECI, 2025).
- **Political Complaints:** Accusations of voter roll manipulation in states like Maharashtra necessitated re-verification (e.g. Rahul Gandhi's allegation).
- **Long Gap Since Last Intensive Revision:** Bihar's last SIR was in 2003; outdated records can compromise electoral integrity.
- **Foreign Nationals Concern:** In border states like Bihar, earlier EC records highlight infiltration risks requiring proof-based verifications.
- **Electoral Transparency:** SIR seeks to enhance voter roll credibility before high-stakes elections, especially in politically sensitive states.

How Does the SIR Process Work?

- **Enumeration Forms:** BLOs distribute pre-filled forms to each household with voter details and seek updated documents.
- **Proof of Citizenship:** Voters, especially those enrolled after 2003, must now submit documents like birth certificates or parents' proof.
- **Verification by EROs:** Electoral Registration Officers decide on inclusion/deletion, with powers to refer doubtful cases under Citizenship Act, 1955.
- **Massive Scale:** In Bihar alone, over **8 crore voters** are being re-verified using **1 lakh BLOs and 4 lakh volunteers**.
- **Timeline Pressure:** The entire revision is expected to be completed by **July 25**, just months ahead of the Assembly elections.

Arguments Supporting the SIR:

- **Constitutional Mandate of ECI**: Under **Article 324**, ECI has plenary powers to ensure free and fair elections (SC: *Mohinder Singh Gill case*, 1977).
- **Duplicate Roll Cleanup:** Migration and multi-location enrolment threaten electoral integrity; SIR helps sanitize rolls.
- **Precedent Exists:** SIRs were conducted earlier in 1952–2004, especially post-state reorganisation or major demographic shifts.
- **Tech-Enabled Transparency:** Use of digitised databases, photos, and GPS-based records enhances monitoring and reduces human error.
- **Political Neutrality Claim:** ECI states all parties were notified and asked to appoint Booth Level Agents (BLAs) to observe the process.

Arguments Against the SIR:

- **Burden Shift on Citizens:** Unlike past practice, the **burden of proof now lies on voters**, not objectors (contradicts Rule 18, Registration of Electors Rules).
- **Arbitrary Post-2003 Divide:** Only voters enrolled after 2003 face strict checks—an illogical cutoff lacking legal precedent.
- **Disenfranchisement Risk:** In **Seemanchal and flood-prone areas**, voters without birth certificates may be excluded despite Aadhaar or EPIC.
- **Procedural Irregularities:** Field complaints include wrong addresses (e.g., "cremation ground"), missing names, and blank entries in Muzaffarpur.
- **Political Timing & Selective Targeting:** Conducted only in Bihar before polls—opposition alleges manipulation to benefit ruling alliance.

Way Ahead:

- **Clarify Citizenship Documentation:** Government must notify an official citizenship proof under the **Citizenship Act** to avoid ambiguity.
- **Broaden Accepted Documents:** Include **Aadhaar, Voter ID, Ration Card, MNREGA card**—especially for the marginalised and rural voters.
- **ECI's Own Precedents Must Guide Practice:** Reinstate 2003-style inclusive enumeration without added burdens.
- **Judicial Oversight Post-Election:** As per Mohinder Singh Gill, courts can review post-election actions, safeguarding electoral justice.
- **Uniform, All-India Revision:** Avoid selective targeting; if needed, conduct SIR nationwide to maintain fairness and political neutrality.

Conclusion: The Bihar SIR presents a complex intersection of constitutional powers, voter rights, and administrative discretion. While electoral roll accuracy is critical, due process and citizen dignity must remain central. A balanced, transparent, and inclusive approach is vital for upholding democratic integrity.

Topics: Government policies and interventions for development in various sectors and issues arising out of their design and implementation.

PAC HAS URGED A COMPREHENSIVE REVIEW OF UIDAI'S FUNCTIONING

Context: The Public Accounts Committee (PAC) has urged a

comprehensive review of UIDAI's functioning after biometric verification failures led to wrongful exclusion from welfare schemes and raised concerns over data security breaches.

About PAC has urged a comprehensive review of UIDAI's functioning:

- **What it is PAC?**
  - A parliamentary committee that audits the accounts of the Union Government based on CAG reports.
- **Members:** Comprises 22 MPs (15 from Lok Sabha, 7 from Rajya Sabha); chaired by an opposition leader.
- **Term:** Reconstituted annually.
- **Functions:**
  - Examines public expenditure to ensure it is used efficiently and legally.
  - Reviews autonomous bodies and public undertakings funded by the government.
  - Recently reviewed UIDAI based on the CAG's 2021 report.

Key Issues Highlighted by PAC

- **Biometric Verification Failures:**
  - High failure rates exclude genuine beneficiaries from PDS, MGNREGA, etc.
  - Causes: Worn fingerprints (manual labourers), iris mismatch (elderly).
- **Data Breaches:**
  - PAC flagged reports of Aadhaar data surfacing on the dark web.
  - UIDAI claimed its central repository is secure and leaks mostly occur at enrolment centres.
- **Duplicate and Inactive Aadhaar IDs:** Aadhaar numbers exceed India's population; slow deactivation after death raises risk of misuse.
- **Grievance Redressal Gaps:** Citizens face difficulty correcting errors or resolving failed authentication issues.
- **Use of Aadhaar by Ineligible Entities:** Some MPs warned of Aadhaar being accessed by non-citizens, leading to welfare misuse.

Implications of Aadhaar Verification Failures & Data Issues

- **Social Exclusion:** Biometric mismatches deny genuine beneficiaries access to welfare schemes like PDS and MGNREGA.
- **Security Threats:** Data leaks and duplicated Aadhaar numbers expose citizens to identity theft and fraud.
- **Erosion of Trust in Institutions:** Frequent authentication failures and reports of data breaches reduce public faith in UIDAI.
- **Welfare Leakages and Misuse:** Fake or duplicated Aadhaar numbers enable ineligible persons to access subsidies.
- **Governance Inefficiency:** Grievance redressal failures and slow deactivation of deceased persons' Aadhaar delay service delivery.

Recommended Measures by PAC:

- **Scientific Audit of Repository:** A full-fledged forensic and technical review of UIDAI's central database is needed.
- **Simplify Aadhaar Enrolment:** Reduce procedural barriers and allow flexible documentation for genuine residents.
- **Strengthen Data Security:** Enforce stricter compliance protocols at Aadhaar enrolment and update centres.
- **Accelerate Deactivation Post-Death:** Integrate UIDAI with state civil registries to auto-deactivate Aadhaar of deceased.
- **Adopt Inclusive Verification Alternatives**: Enable facial recognition, OTP-based authentication, or assisted verification models.
- **Ensure Beneficiary Citizenship:** Review Aadhaar issuance to suspected non-citizens misusing schemes meant for Indians.

Conclusion:

The PAC has rightly flagged Aadhaar-related operational and ethical concerns, highlighting the need for technological upgrades and policy reforms. Ensuring secure, inclusive, and error-free Aadhaar authentication is vital to uphold welfare delivery, privacy, and national trust in digital governance.

MOTOR VEHICLE AGGREGATOR GUIDELINES (MVAG), 2025

Context:

The Ministry of Road Transport and Highways notified the Motor Vehicle Aggregator Guidelines (MVAG), 2025, revising the 2020 norms to reflect new mobility trends like bike taxis, EVs, and app-based autorickshaws.

About Motor Vehicle Aggregator Guidelines (MVAG), 2025:

- **What It Is?**
  - MVAG is a **regulatory framework** under the **Motor Vehicles Act, 1988** that governs how app-based ride-hailing platforms like Ola, Uber, and Rapido operate in India.
- **Issuing Ministry:** Ministry of Road Transport and Highways, Government of India
- **Key Features of MVAG 2025:**
- **Driver Welfare and Earnings:**
  - Drivers must receive at least **80% of the fare** if using their own vehicle.
  - If using aggregator-owned vehicles, they must get **minimum 60% share**.
  - Mandatory **health insurance of ₹5 lakh** and **term insurance of ₹10 lakh** per driver.
  - **Quarterly training** for low-rated drivers (bottom 5 percentile).
- **Passenger Protection Measures:**
  - ₹5 lakh **mandatory travel insurance** per passenger.
  - Aggregators must resolve complaints within **3 days** and inform passengers of outcomes.
  - Fare must be charged only from **pick-up to drop-off point**.
- **Regulated Fare Structure:**
  - State governments to fix **base fare** per vehicle category.
  - Aggregators can charge **50% less** than base fare or **up to twice** as dynamic pricing cap.
  - This introduces **price predictability** and caps surge pricing.
- **Penalties for Ride Cancellations:**
  - **10% penalty** on either driver or rider for unjustified cancellations (capped at ₹100).
  - Valid reasons for cancellations must be listed on apps/websites for transparency.
- **Bike-Taxi Recognition:**
  - For the first time, **non-transport motorcycles** allowed for ride-hailing, subject to state approval.
  - Provides legal clarity for platforms like **Rapido** in regulatory grey zones.
- **EV Promotion & Accessibility:**
  - States can now mandate **annual EV adoption targets** for aggregators.
  - Inclusion of **Divyangjan-accessible vehicles** made compulsory to enhance inclusivity.
- **Enhanced Driver Screening:**
  - Drivers must undergo **police verification**, **medical tests**, and **psychological assessments** before onboarding.
  - Aggregators must provide **induction training** and annual refresher courses.
- **Grievance Redressal and Licensing Norms:**
  - Aggregators must appoint a **grievance officer**, display contact details on app/ website.
  - A **centralised portal** will manage licences, renewals, deposits — easing compliance.
- **Strict Compliance and Penalties:**
  - Violations may attract **fines from ₹1 lakh to ₹1 crore**.
  - Repeat offenders face **license suspension for 3 months**, and eventual cancellation.

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

PM-POSHAN SCHEME

Context:

A century after its inception in Madras, the PM-POSHAN scheme continues to combat hunger and promote education, but a new report highlights persistent ground-level challenges like fund delays, caste discrimination, and rising costs.

About PM-POSHAN scheme:

- **Full Name:** Pradhan Mantri Poshan Shakti Nirman Yojana
- **Launched In:** 2021–22 (replacing the 1995 Midday Meal Scheme)
- **Type:** Centrally Sponsored Scheme (60:40 Centre-State cost-sharing)
- **Objective:** Provide **one hot cooked meal per day** to students of Classes 1–8 in government and government-aided schools.

Key Features:

1. **Nutritional Focus:**Provides rice/wheat, pulses, vegetables, and eggs/bananas where allowed.
2. **Coverage:**Benefits **11.80 crore children** in **11.20 lakh schools** (as of 2023–24).
3. **Funding Outlay:**₹54,061 crore (Centre) + ₹31,733 crore (States/UTs) till 2025–26.
4. **Additional Innovations:**Promotes **nutrition gardens, IT-based monitoring**, and social audit mechanisms.
5. **Implementation Linkages:**Tied with Samagra Shiksha Abhiyan and Poshan Abhiyan for holistic child development.

Successes of PM-POSHAN in India:

- **Increased Enrolment & Retention:**As per a 2024 review, MDM schemes **boosted** enrolment, attendance, and retention, especially among marginalized groups (Jean Dreze study).
- **Gender Equity& Girls' Education:**Tamil Nadu reports dropout rates have fallen drastically among girls due to nutritional support and inclusion of breakfast.
- **Tackling Classroom Hunger:**Midday meals offer **first and only meal** for lakhs of poor children, enhancing concentration and learning outcomes (UNICEF reports).
- **Local Innovations:**Tamil Nadu's *Breakfast Scheme* and Kerala's **egg-fried rice menus** show proactive state-level reforms addressing nutrition.
- **Community Participation:**Kerala's model uses **local cooks and community buy-in** to support child nutrition and hygiene.

Key Challenges in PM-POSHAN Implementation:

- **Delayed Fund Disbursal:**Teachers in Kerala and UP report using personal loans and funds to manage meal expenses due to 3–6 months fund delays.
- **Inadequate Per-Child Allocation:**States like UP and Kerala receive ₹6–10 per child/day, far below actual costs (₹30–40 per child/day).
- **One-Size-Fits-All Policy:**Uniform guidelines ignore local dietary needs, especially in tribal/rural belts.
- **Caste-based Discrimination:**Reports from Delhi NCR, Tamil Nadu, and Bihar reveal Dalit students being segregated or denied meals.
- **Teacher Burden:**School heads like Vasudha in Kerala say cooking/admin duties reduce teaching hours, affecting quality education.
- **Infrastructure Gaps:**Most schools lack multiple cooks, storage, or kitchen space, despite serving hundreds of students.

Way Forward:

- **Revise Cost Norms:**Update allocations based on inflation and region-specific dietary costs to ensure adequate, nutritious meals.
- **Ensure Timely Fund Transfers:**Implement direct transfer systems to schools with strict timelines for transparency.
- **Decentralise Menu Planning:**Let states and districts tailor meal plans to local tastes and nutrition needs (e.g., Odisha's millet inclusion).
- **Strengthen Monitoring Systems:**Use tech-enabled real-time dashboards and social audits to ensure transparency and community oversight.
- **Promote Equity and Dignity:**Conduct regular sensitization and awareness campaigns to eliminate caste-based discrimination in schools.
- **Leverage NGO Partnerships:**Collaborate with civil society to address psychosocial, gender, and nutrition gaps beyond government structures.

Conclusion:

The PM-POSHAN scheme remains central to India's battle against child hunger and dropout rates. While its intent is commendable, implementation gaps weaken its transformative potential. Addressing funding, inclusion, and flexibility can turn it into a true engine of educational equity.

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

MATERNAL MORTALITY IN INDIA

Context:

India's Maternal Mortality Ratio (MMR) stands at 93 per 1 lakh live births (2019–21), showing improvement but also highlighting regional disparities and system failures in emergency obstetric care.

About Maternal Mortality in India:

- **What is Maternal Death?**
  - Death of a woman during pregnancy or within 42 days of termination, due to causes related to or worsened by pregnancy (WHO definition).
- **How is it Calculated?**
  - **Maternal Mortality Ratio (MMR)** = maternal deaths per **100,000 live births**, as per Sample Registration System (SRS) data.
- **Data Snapshot (2019–21)**:

- **India's MMR:** 93
- **Kerala:** Lowest (20) and**Assam**: Highest (167)
- Southern States fare better than Empowered Action Group (EAG) States.

Need for Controlling Maternal Deaths:

- **Public Health Indicator**:MMR reflects **quality of healthcare, gender equity, and governance**.
- **Preventable Tragedy:**Most maternal deaths are **avoidable** with timely care and basic obstetric support.
- **Global Commitments:**SDG Target 3.1 aims to **reduce global MMR to <70 by 2030**. India needs faster acceleration.

Key Challenges:

- **Three Delays Framework (Deborah Maine Model)**:
  - **Delay in decision-making** to seek care due to lack of awareness or social barriers.
  - **Delay in reaching care**, especially in remote/ tribal areas.
  - **Delay in receiving care** due to lack of specialists, blood, or operation readiness.
- **Infrastructure Gaps:**
  - Only 2,856 of 5,491 CHCs function as **First Referral Units (FRUs)**; 66% specialist vacancies reported.
- **Medical Complications:**
  - Postpartum haemorrhage, **hypertensive disorders**, obstructed labour, sepsis, and unsafe abortions are leading causes.
- **Underlying Health Issues:**
  - Anaemia, malnutrition, and comorbidities like **malaria, TB, and UTIs** heighten risks, especially in EAG States.

Government Initiatives:

- **Janani Suraksha Yojana (JSY):**Promotes institutional deliveries via **financial incentives** to mothers and ASHAs.
- **Janani Shishu Suraksha Karyakram (JSSK):**Provides **free transport, diagnostics, and delivery services**.
- **FRU Operationalisation:**Aims for **minimum 4 FRUs per district**, equipped with specialists and blood storage.
- **Maternal Death Reviews (MDRs):**Mandatory under NHM to **audit every maternal death** and correct systemic failures.
- **Kerala's Confidential Review Model**:An example in reducing MMR to 20 using targeted clinical training and facility readiness (e.g., uterine clamps, embolism response).

Way Ahead:

- **Focus on EAG States:**Invest in **specialist recruitment, FRU infrastructure**, and localised health education.
- **Strengthen Emergency Response:**Ensure **24x7 blood banks**, ambulance access, and obstetric surgical capacity in rural belts.
- **Empower Community Health Workers:**Scale up **ASHA-ANM collaboration**, maternal tracking, and family counselling.
- **Enhance Pre-natal & Post-natal Care:**Early registration, iron-folic supplementation, and antenatal risk screening must be mandatory.
- **Adopt Best Practices Nationally:**Emulate **Kerala's confidential review system** in Tamil Nadu, Maharashtra, Jharkhand, etc., for deeper systemic corrections.

Conclusion:

Maternal deaths are **largely preventable** through timely, quality care and responsive systems. India must combine **grassroots action with facility preparedness** to reduce MMR further. The goal is not just safe delivery but **safe motherhood**.

WHO ROADMAP ON AI IN TRADITIONAL MEDICINE

Context:

The WHO released its first technical roadmap titled "Mapping the Application of AI in Traditional Medicine"on the use of Artificial Intelligence in traditional medicine, adopting India's proposal under the GI-AI4H initiative.

- It also recognised India's key digital initiatives like TKDL and Ayurgenomics in the global framework.

About WHO Roadmap on AI in Traditional Medicine:

- **Definition & Aim:** The roadmap titled "Mapping the application of AI in traditional medicine" provides a **strategic guide for safe, ethical, and effective AI integration** in traditional healthcare systems.
- **India's Role:** India led the proposal through **Ministry of AYUSH**, emphasizing **digitisation, personalised medicine**, and **global AI standards** in Ayurveda, Siddha, Unani, and other practices.
- **Global Relevance:** First of its kind under WHO's Global Initiative on AI for Health (GI-AI4H) with

partner countries.

Status of Traditional Medicine Globally:

- **Global Usage:** Over **80% of the world's population** uses some form of traditional medicine (WHO).
- **India's Share:** Home to over **500,000 AYUSH practitioners**; strong push through **National AYUSH Mission**, TKDL, and collaborations with WHO Global Centre for Traditional Medicine (GCTM), Jamnagar.
- **Market Size:** Global traditional medicine market expected to cross **$200 billion by 2030**.

Need for AI in Traditional Medicine:

- **Personalized Care:** AI enables custom treatment by aligning Ayurveda's *prakriti* with modern genomics (*Ayurgenomics*).
- **Evidence Creation:** AI can analyze large classical texts and clinical data to validate traditional practices.
- **Cost-effective Tools:** Chatbots, mobile diagnostics, and virtual support systems increase access, especially in rural areas.
- **Global Acceptance:** AI offers a **standardized clinical language** for integrating traditional systems in modern care.
- **Data Management:** AI simplifies classification of herbs, symptoms, and diagnostics from thousands of classical sources.

Challenges in AI-Enabled Traditional Medicine:

- **Ethical Concerns:** Risk of data bias, consent violation, and incorrect predictions using unverified datasets.
- **Lack of Evidence Base:** Many traditional therapies lack clinical trials or structured outcome data for AI training.
- **Regulatory Ambiguity:** No **clear legal norms** governing AI use in Ayurveda, Siddha, Unani, etc.
- **Cultural Fragmentation:** Variations between global traditional systems make **interoperability difficult**.
- **Trust Issues:** AI-generated advice may erode traditional practitioner-patient trust without adequate explainability.

Key Features of WHO's AI Roadmap:

- **Use Case Mapping:** AI tools categorized into diagnostics, clinical support, text digitization, and public health.
- **Governance Principles:** Includes transparency, safety, explainability, accountability, and fairness in AI systems.
- **Technical Enablers:** Emphasis on **interoperable data sets, skilled workforce, regulatory frameworks**.
- **Innovation Models:** Encourages **co-creation** between AI engineers and traditional medicine practitioners.
- **Country-Specific Examples:** Recognizes India's **TKDL**, **Ayurgenomics**, and planned **AYUSH AI Chatbots**.

Conclusion:

India's leadership in combining ancient wisdom with cutting-edge AI has received global validation. WHO's roadmap lays the foundation for a secure and inclusive AI transition in traditional medicine. The challenge now lies in **balancing innovation with ethical safeguards** for long-term global health integration.

MENTAL HEALTH

Context:

The Air India Ahmedabad accident reignited debate on pilot mental health, a typically unspoken crisis within the aviation sector.

About Mental Health:

What is Mental Health?

- **Mental health** is a state of cognitive and emotional well-being that helps individuals handle stress, work productively, and contribute to society.
- It exists on a **continuum**, varying in intensity across individuals and life stages.
- Mental health is **not merely the absence of illness**—it includes psychological resilience, social competence, and emotional balance

Characteristics of Good Mental Health:

- **Emotional stability:** Ability to regulate mood and responses.
- **Cognitive clarity:** Capable of critical thinking and decision-making.
- **Social functionality:** Engages in healthy relationships and community.
- **Work productivity:** Manages work responsibilities effectively.
- **Coping ability:** Manages stress, trauma, or setbacks with resilience.

Importance of Mental Health:

- **Core to human development:** Mental health supports emotional growth, enabling individuals to

learn, work, and engage socially.

- **Reduces disease burden:** Untreated mental illness increases the risk of chronic diseases and lowers immunity.
- **Prevents suicides:** Suicide often stems from undiagnosed or untreated mental illness, especially in youth.
- **Economic gains:** WHO estimates that every $1 spent on mental health yields $4 in economic productivity.
- **Human rights:** Mental health ensures dignity, freedom, and full participation in society.

Challenges to Mental Health:

- **Stigma and taboo:** Societal attitudes equate mental illness with weakness, discouraging open discussion.
- **Workplace pressures:** Irregular hours, performance anxiety, and job insecurity strain mental well-being.
- **Poor access to care:** Many rural or low-income regions lack trained professionals and facilities.
- **Financial stress:** Debt, job loss, and healthcare costs can intensify anxiety and depression.
- **Screening limitations:** Mental health assessments rely heavily on subjective responses.

India's Initiatives on Mental Health

- **Mental Healthcare Act, 2017:** Legal right to quality care; decriminalized suicide.
- **National Mental Health Programme (1982):** Decentralized care via District Mental Health Programme (DMHP) in 767 districts.
- **Tele-MANAS (2022):** 24x7 tele-counselling through toll-free helpline 14416.
- **Suicide Prevention Strategy (2022):** Targets 10% reduction in suicide by 2030.

Global Initiatives:

- **WHO Mental Health Action Plan (2013–2030):** Focus on governance, services, data, and rights.
- **Mental Health Gap Action Programme (mhGAP):** Empowers non-specialists to provide care.
- **UNCRPD Compliance:** Supports legal reforms for disability rights.
- **Lancet Commissions & Global Mental Health Movement:** Evidence-driven advocacy and funding.
- **FAA & UN Mental Health Strategy (2024):** Institutional support for workplace mental health and aviation safety.

Measures Needed:

- **Peer-support networks:** Trained colleagues can identify early signs and offer safe spaces to speak. Such groups reduce isolation and bridge gaps in formal care.
- **Workplace mental leave:** Allowing leave during personal crises aids recovery and long-term productivity.
- **Early detection training:** Train teachers, managers, and trainers to spot emotional distress early.
- **Regulatory reform:** Avoid punitive policies like forced tests that discourage disclosure.
- **Community-based models:** Integrate mental health into primary care, tele-counselling, and NGOs.

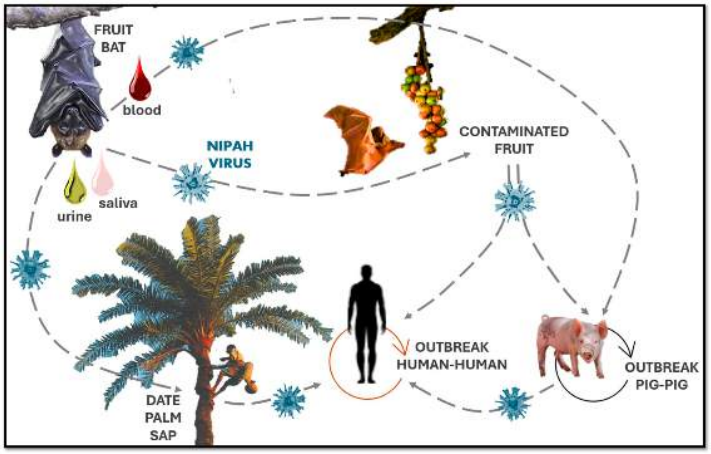
Conclusion:

Mental health is not a side issue—it's central to human, economic, and national well-being. It deserves de-stigmatized dialogue, strategic investment, and empathetic institutional reforms. A resilient society begins with a psychologically safe citizenry.

NIPAH VIRUS (NIV)

Context:

Kerala has launched a serological survey to investigate the recurring outbreaks of Nipah virus (NiV), especially in high-risk zones of northern Kerala, where the virus has reappeared for the eighth time in eight years.



About Nipah virus (*NiV*):

- **What is Nipah Virus?**
  - Nipah is a **zoonotic virus** that spreads from **animals (mainly bats)** to humans.
  - It causes illnesses ranging from **mild respiratory issues** to fatal encephalitis.
  - The **case fatality rate** ranges from **40% to 75%**, varying by region and healthcare response.
- **Past Outbreaks:**
  - **First detected** in **Malaysia (1999)** among pig farmers.
  - **Bangladesh** reported annual outbreaks since 2001.
  - **India** has seen outbreaks in **West Bengal (Siliguri)** and **Kerala**, where **eight episodes** have occurred since 2018.
- **Natural Host & Vector:**
  - **Fruit bats** of the Pteropodidae family (genus Pteropus) are the **natural reservoirs**.

- Infected bats can transmit the virus through **saliva, urine, or feces** on fruits or nearby surfaces.

- **Transmission Pathways:**
  - **Animal to Human:**
    - Through **direct contact with infected pigs or bats**.
    - Via **contaminated food or fruit juices**, e.g., **raw date palm sap**.
  - **Human to Human:**
    - Close contact with **infected individuals' bodily fluids**.
    - Common in **healthcare settings**, especially among caregivers and hospital workers.
- **Clinical Symptoms:**
  - **Early symptoms**: Fever, sore throat, headache, myalgia, vomiting.
  - **Severe cases:** Encephalitis, seizures, altered consciousness, respiratory distress.
  - **Incubation period:** Typically, **4–14 days**, but can extend up to **45 days**.
  - **Long-term effects:** 20% of survivors may suffer **neurological issues** such as personality changes or seizures.
- **Diagnosis Methods:**
  - **RT-PCR:** Detects virus RNA in bodily fluids.
  - **ELISA:** Detects NiV-specific antibodies.
  - **Virus isolation** and **PCR assays** used in advanced labs.
- **Kerala's New Serological Survey:**
  - Uses **pseudo virus neutralisation assays** to detect antibodies.
  - Targets **high-risk populations** (humans + domestic animals) near known Nipah hotspots.
  - Aims to understand **spillover dynamics**, animal reservoirs, and **transmission chains**.

PARAKH RASHTRIYASARVEKSHAN REPORT

Context:

The PARAKH RashtriyaSarvekshan Report has revealed significant learning deficits among Indian students, especially in mathematics, language, and science across Grades 3, 6, and 9.

About PARAKH RashtriyaSarvekshan Report:

PARAKH Report:

- **What it is?**
  - A national-level, competency-based student assessment under **PARAKH** – Performance Assessment, Review, and Analysis of Knowledge for Holistic Development – earlier known as the **National Achievement Survey (NAS)**.
- **Released by:** Ministry of Education, Government of India; conducted in December 2024 by NCERT under the national assessment body PARAKH.

Performance Comparision by School Management & Social categories

	Language				Mathematics			
	State govt	Govt aided	Private	Central govt	State govt	Govt aided	Private	Central govt
Grade 3	64	63	64	60	64	63	64	60
Grade 6	52	52	60	69	52	52	60	69
Grade 9	48	49	59	69	48	49	59	69
	Language				Mathematics			
	State govt	Govt aided	Private	Central govt	State govt	Govt aided	Private	Central govt
Grade 3	–	–	–	–	–	–	–	–
Grade 6	–	–	–	–	–	–	–	–
Grade 9	37	37	44	51	37	37	42	49

Key Summary of Findings:

Grade 3:

- **Language**:
  - 60% could read and comprehend short stories and instructions.
  - 67% could use vocabulary in daily interactions.
- **Maths**:
  - Only 55% could arrange numbers up to 99 correctly.
  - 58% could add and subtract two-digit numbers; only 54% understood multiplication/division concepts.
  - 50% could identify geometric shapes and perform money transactions up to ₹100.

Grade 6:

- **Maths**:
  - Just 38% could solve daily-life arithmetic problems.
  - Only 29% could work with fractions; 42% could estimate area, perimeter, and volume.
- **EVS & Social Understanding**:
  - 44% could observe and describe natural and social elements.
  - 38% could identify patterns in environment (moon phases, rituals, climate change, etc.).
  - 56% could explain functions of institutions like panchayats, banks, schools.

Grade 9:

- **Language**:
  - 54% could extract main ideas from editorials or reports.
- **Maths**:
  - Only 28–31% could apply percentage or fractions in real life.
  - 31% understood number sets (integers, rational, real).
- **Science**:
  - Just 34% could distinguish between living

and non-living traits.
    - 37% could explain pressure, temperature, and density-based phenomena.
    - One-third explained electric circuits, hormonal changes, and magnetic effects.

Top and Bottom Performers:

- **Top States/UTs:** Punjab, Kerala, Himachal Pradesh, Chandigarh, Dadra & Nagar Haveli-Daman & Diu (all three grades).
- **Low-performing Districts:** Meghalaya (Garo Hills), Shi Yomi (Arunachal), Reasi& Rajouri (J&K), Sahebganj (Jharkhand).
- **School Type Trends**:
    - **Grade 3**: Lowest math scores in KendriyaVidyalayas.
    - **Grade 6**: Weak math outcomes in **state-run and aided schools**.
    - **Grade 9**: **KendriyaVidyalayas** performed best in language.

NEP@5: FIVE YEARS OF NATIONAL EDUCATION POLICY 2020

Context:

The National Education Policy (NEP) 2020 has completed 5 years since its launch on 29th July 2020. the policy has seen some classroom-level implementation but continues to face delays due to institutional hurdles and Centre–State disagreements.

About NEP@5: Five Years of National Education Policy 2020:

Key Provisions of NEP 2020:

1. **New School Structure (5+3+3+4):** Replaces the 10+2 model with a learning-focused framework from ages 3–18. E.g., preschool (3–6 years) is now formally integrated into schooling.
2. **Foundational Literacy & Numeracy (FLN):** NIPUN Bharat aims to ensure all students attain basic literacy and numeracy by Class 3.

   E.g., PARAKH surveys monitor progress.
3. **Multilingual Education:** Promotes mother tongue/ regional language as the medium till Grade 5, supporting cognitive development.
4. **Flexible Undergraduate Education:** Introduces multiple entry-exit options, Academic Bank of Credits (ABC), and multidisciplinary courses.
5. **Common Entrance Test (CUET):** National-level admission test for UG courses to ensure fairness and eliminate multiple exams.
6. **Teacher Training Overhaul:** National Professional Standards for Teachers (NPST) and integrated B.Ed programmes to improve quality.
7. **Equity & Inclusion:** Focus on SC/ST/OBC, minorities, women, and NE states; expansion of scholarships and language access.
8. **Regulatory Reform – HECI Proposal:** Plans to replace UGC, AICTE with one umbrella regulator — Higher Education Commission of India.
9. **Digital and Adult Education Push:** Enhancing online learning, MOOC recognition, and aiming for 100% youth/adult literacy.
10. **Increase Education Spending to 6% of GDP:** Targets higher public investment in both school and higher education sectors.

Achievements in the Last 5 Years:

- **Surge in Enrolment & Inclusivity:** Higher education enrolment rose to 4.46 crore and SC, ST, Muslim, and NE students saw 36–75% growth.

  E.g. Female PhD enrolment doubled to 1.12 lakh, showing gender and regional inclusion.
- **Early Childhood Education Gains:** Over 1.1 crore enrolled in Balvatikas; 4.2 crore children entered 'Vidya Pravesh' readiness modules.

  E.g. ECCE linked to play-based and language-diverse kits like Jaadui Pitara.
- **Foundational Literacy Drive (NIPUN Bharat):** ASER 2024: 23.4% Class III students read Grade II text vs 16.3% in 2022 and arithmetic gains also visible.
- **Credit Flexibility and ABC Rollout:** 32 crore Academic Bank of Credit (ABC) IDs created and 2,556 institutions onboarded.
- **Internationalisation & CUET Success:** CUET adopted widely, reducing coaching race; IIT/IIM campuses opened in Dubai, Zanzibar.

Challenges in Implementation:

- **Federal Tensions and Policy Pushback:** States like Tamil Nadu, Kerala oppose PM SHRI and 3-language formula citing centralisation.
- **Slow Institutional & Legal Reforms:** HECI Bill still pending; Board exam reform (2 attempts/year) yet to scale.

- **Teacher Training and Curriculum Delay:** National Curriculum Framework for Teacher Education (NCFTE) not released.
- **Poor Exit–Entry Uptake Despite Credits:** Only ~31,000 UG and ~5,500 PG students used the ABC system till 2025.
- **Infrastructure and Digital Access Gaps:** Many rural schools lack digital tools, trained staff, or early-grade resources.

Way Forward:

- **Centre–State Synergy and Localisation:** Adapt NEP flexibly via contextual MoUs, capacity-building, and decentralised reforms.
- **Strengthen Foundational & ECCE Systems:** Upgrade Anganwadis, align ECCE–school pedagogy, and scale training modules.

  E.g. Expand Jaadui Pitara and Vidya Pravesh under NIPUN Bharat.
- **Operationalise HECI & Regulatory Unification**: Fast-track the Higher Education Commission of India Bill for unified oversight.

  E.g. Merge NHERC, NAC, GEC, and HEGC for standardised regulation.
- **Expand Awareness of Credit & Digital Frameworks:** Launch outreach drives in universities for ABC/NCrF uptake and reduce dropouts.
- **Promote Equity, Research & Financing Models:** Set up caste–gender dashboards and support regional language content and blended finance.

Conclusion:

The NEP 2020 has made visible progress in enrolment, foundational learning, and institutional flexibility. Yet, policy bottlenecks, digital divides, and centre–state friction slow its full potential. A calibrated push for inclusive, locally-adapted, tech-integrated reforms can turn vision into ground reality.

Topics: Issues relating to poverty and hunger.

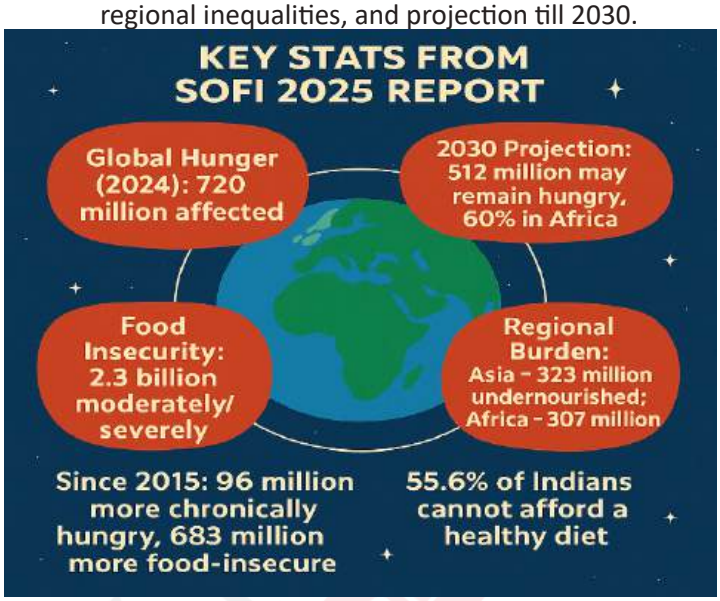
STATE OF FOOD AND NUTRITION IN THE WORLD' (SOFI) 2025 REPORT

Context:

The UN's State of Food and Nutrition in the World' (SOFI) 2025 report revealed that 8.2% of the global population — around 720 million people — were affected by chronic hunger in 2024.

About State of Food and Nutrition in the World' (SOFI) 2025 report:

- **Published by:** FAO, WFP, IFAD, WHO, and UNICEF.
- **Purpose:** Tracks global progress on SDG 2 — zero hunger & malnutrition eradication.
- **2025 Focus:** Post-COVID recovery, food affordability, regional inequalities, and projection till 2030.



Key Features of SOFI 2025 Report:

- **Global Underperformance:** Despite marginal improvements, global hunger levels in 2024 remain above pre-pandemic benchmarks, jeopardising the 2030 SDG-2 target.
- **Regional Disparities:** Africa, though home to fewer people than Asia, sees over 20% of its population undernourished, reflecting stark regional imbalances.
- **Asia's Burden:** Asia continues to host nearly half of the world's food-insecure population due to sheer numbers, despite modest regional improvements.
- **Southeast Progress:** Countries in Southeast Asia and South America registered slight declines in hunger, driven by social protection and agri-nutrition reforms.
- **Diet Affordability:** Over 3 billion people globally are unable to afford a healthy diet, pushing them toward calorie-dense but nutrient-poor options.
- **Climate & Conflict Linkages:** Ongoing wars and climate events like droughts and floods remain primary catalysts for hunger post-2020.
- **Sluggish Recovery:** Only a 65 million decline in undernourishment is projected by 2030—nowhere close to the 'zero hunger' ambition.

India and SOFI 2025 Report:

- **Affordability Crisis:** 55.6% of India's population cannot afford a nutritious diet, indicating a failure in food access despite surplus grain stocks.
- **Rural–Urban Divide:** Urban food access has improved due to income recovery, while rural India suffers due to PDS inefficiencies and price volatility.
- **Child Malnutrition:** India still ranks among the highest in child stunting and wasting, indicating persistent early-age nutritional failure.
- **Hidden Hunger:** Micronutrient deficiencies remain rampant due to cereal-heavy diets with inadequate intake of fruits, vegetables, and proteins.

- **Policy Shift Needed:** Experts demand inclusion of millets, pulses, and fortified foods into public schemes to tackle undernutrition holistically.

Analysis of Report:

- **Positive Developments:**
  - **Global Gains:** Hunger prevalence declined from 8.7% (2022) to 8.2% (2024), showing slow but visible improvement.
  - **Regional Recovery:** Progress in Southeast Asia and Latin America offers hope for replicable best practices in targeted interventions.
  - **Diet Awareness:** Governments and civil society have amplified focus on diet quality and nutrition education globally.
  - **Institutional Convergence:** The collaboration of FAO, WFP, IFAD, WHO, and UNICEF fosters comprehensive, multi-sectoral responses.
  - **Data Systems:** Hunger mapping and nutrition tracking technologies enable quicker and more targeted interventions.
- **Negative Trends:**
  - **Post-COVID Setback:** The pandemic reversed a decade of gains, leaving 96 million more people hungry than in 2015.
  - **Africa's Challenge:** By 2030, 60% of global undernourished will be in Africa, highlighting the urgency for continental support.
  - **SDG Drift:** With just a 65 million projected decline by 2030, the pace is too slow to meet global targets.
  - **Inequality Spike:** The cost of healthy food has risen disproportionately, hurting low-income groups most severely.
  - **Persistent Undernourishment:** Despite surplus global production, equitable distribution remains a major bottleneck.

Way Ahead:

- **Nutrition-centric PDS:** Revamp India's food system by adding diverse, locally grown, and nutrient-rich foods into subsidised channels.
- **Diversify Agriculture:** Move beyond rice-wheat dominance to include millets, pulses, and horticulture to improve dietary balance.
- **Resilient Food Systems:** Invest in region-specific, climate-adaptive food systems to enhance food security and reduce disaster-linked hunger.
- **Global Coordination:** Support Africa and South Asia through climate finance, food aid, and region-focused SDG cooperation.
- **Improve Affordability:** Align food prices with income growth via minimum wages, inflation targeting, and better supply chains.

Conclusion:

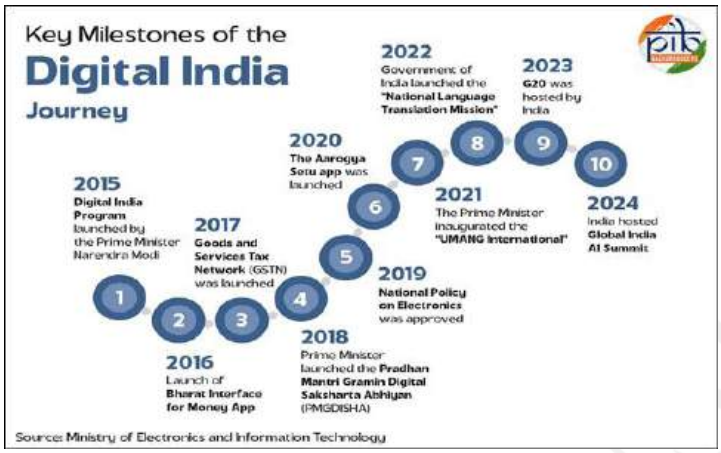
The SOFI 2025 report serves as a reality check on SDG-2, highlighting the growing gap between commitments and outcomes. For India, tackling hidden hunger and diet affordability must be policy priorities. True food security lies not in quantity alone but in nutrition and equity.

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

10 YEARS OF THE DIGITAL INDIA INITIATIVE

Context:

India celebrated 10 years of the **Digital India initiative** on July 1. Prime Minister Narendra Modi highlighted its transformation from a governance scheme into a people-driven movement.



About 10 years of the Digital India Initiative:

- **What is Digital India?**
  - **Launched**: 1st July 2015 by the Prime Minister of India.
  - **Ministry**: Ministry of Electronics and Information Technology (MeitY).
  - **Vision**: To transform India into a **digitally empowered society** and **knowledge economy**.
  - **Objective**: Deliver digital infrastructure as a utility to every citizen, ensure governance & services on demand, and digitally empower citizens.

Core Pillars of Digital India:

1. **Broadband Highways**: Ensure high-speed internet to rural and urban areas.
2. **Universal Mobile Access**: Expand network coverage in remote areas.
3. **Public Internet Access Programme**: Provide access through Common Service Centres (CSCs).
4. **e-Governance**: Simplify government procedures using IT.
5. **e-Kranti**: Deliver services electronically (education, health, etc.).
6. **Information for All**: Promote open data and citizen engagement.
7. **Electronics Manufacturing**: Promote domestic production.
8. **IT for Jobs**: Provide digital skill training.
9. **Early Harvest Programmes**: Quick-win projects like biometric attendance and Wi-Fi hotspots.

Achievements in 10 Years:

- **Internet Access**: Internet connections grew from **25 crore (2014)** to **96.96 crore (2024)**, expanding digital access to even remote rural regions.
- **Digital Payments**: India leads the world in digital transactions, accounting for **49% of global real-time payments**.
- **Digital Economy Contribution**: The digital economy's share in GDP rose to **11.74%** (2022–23), and is projected to reach **13.42%** (2024–25).
- **BharatNet**: Over **2.18 lakh Gram Panchayats** connected with high-speed optical fibre, improving last-mile connectivity.
- **DigiLocker**: Over **53.92 crore citizens** use DigiLocker to access documents like PAN, Aadhaar, and educational certificates online.
- **UMANG App**: Offers **2,300+ services** in 23 languages, with over **8.34 crore registered users**.
- **Digital Literacy (PMGDISHA)**: Over **6 crore rural individuals** trained in basic digital skills, empowering citizens to use smartphones and apps.
- **Aadhaar & DBT**: ₹44 lakh crore transferred through Direct Benefit Transfers linked with Aadhaar, eliminating middlemen.

Success Factors of Digital India:

- **Digital Public Infrastructure (DPI)**: Aadhaar for identity, UPI for payments, and DigiLocker for documentation created a strong digital foundation.
- **Cost-Effective Internet:** India offers the **world's cheapest mobile data (~₹10/GB)**, enabling mass affordability.
- **Widespread Mobile Access:4.74 lakh 5G towers** now cover **99.6% of districts**, enabling high-speed connectivity nationwide.
- **Start-up and MSME Boost:** ONDC and GeM enabled **small sellers and MSMEs** to access nationwide digital markets.
- **AI and Semiconductors Push:**IndiaAI and the ₹76,000 crore Semiconductor Mission focus on **next-gen tech innovation**.

Scope for Improvement:

- **Digital Divide**: Significant disparities still exist in **device ownership and internet usage**, especially among women and the poor.
- **Data Protection**: Citizens lack awareness of privacy rights and the **Personal Data Protection Act is still evolving**.
- **Regional Language Access**: Though Bhashini supports 35+ languages, most digital content

remains English-centric.

- **Infrastructure Gaps:** **Power cuts, low bandwidth**, and poor last-mile delivery affect connectivity in hill, tribal, and border areas.
- **Skill Mismatch**: Demand for high-end tech jobs far outpaces **availability of skilled workforce**, especially in AI and cybersecurity.

Way Ahead:

- **Strengthen Digital Education:** Scale platforms like **DIKSHA, SWAYAM, PM eVIDYA** with vernacular and skill-based content.
- **Bridge Urban-Rural Gaps:** Expand internet infrastructure, smartphone subsidies, and community training centres in under-served areas.
- **Promote Inclusive AI:** Use AI for **smart agriculture, flood alerts, healthcare diagnostics**, and education access.
- **Improve Data Security**: Strengthen CERT-In, implement **data fiduciary norms**, and raise awareness on digital safety.
- **Boost Digital Exports:** Promote DPI models like UPI and Aadhaar in **Global South**, positioning India as a digital diplomacy leader.

Conclusion:

Digital India has redefined governance, service delivery, and empowerment over the last decade. As India advances towards becoming a Viksit Bharat, the next phase must focus on inclusivity, ethical innovation, and global digital leadership.

CUSTODIAL DEATHS IN INDIA

Context:

A Madurai Bench of the Madras High Court condemned the custodial torture of Ajith Kumar in Sivaganga, Tamil Nadu, calling it "more brutal than a murder."

About Custodial Death in India:

What is Custodial Death?

- Custodial death refers to the death of a person while in police, judicial, or military custody—before trial, during trial, or after conviction.
- It includes both natural causes (like illness) and unnatural ones (like torture, assault, or negligence).

Custodial Death Statistics in India:

- **NHRC (2021–22):** 2,150 deaths in judicial custody and 155 in police custody and only 21 saw disciplinary action (0.23%).
- **NCRB (2000–2020):** 1,888 deaths reported and only 26 convictions despite 893 cases filed against police.
- **Between 2017–22:** 345 judicial inquiries; 123 arrests, 79 chargesheets, but 0 convictions.
- **Tamil Nadu (2016–2022):** 490 deaths—highest in southern India.

Reasons for Custodial Deaths in India:

- **Lack of Anti-Torture Law:** India has signed but not ratified the UN Convention Against Torture and no standalone anti-torture legislation.

  E.g. Law Commission (273rd Report) recommended such a law in 2017.
- **Opaque Investigations:** Police often destroy evidence or manipulate records; conviction is rare.

  E.g. In Ajith's case, post-mortem shifted and CCTV footage missing.
- **Overcrowded & Understaffed Prisons:** Poor medical care, mental health neglect, and high stress lead to deaths by suicide or illness.
- **Targeting Marginalized Groups:** SCs make up 38.5% of preventive detenues in Tamil Nadu, despite forming only 20% of the population.
- **Weak Internal Accountability:** Arrests without FIR, unofficial detentions, and cover-ups are common practices in lower ranks.

Important Judicial Pronouncements:

- **DK Basu vs State of West Bengal (1996):** Laid down 11 guidelines for arrest and detention—mandatory medical check-ups, arrest memo, etc.
- **Nilabati Behera vs State of Orissa (1993):** Compensation awarded to victim's family; held State responsible under Article 21.
- **PUCL vs Union of India (2005):** Directed installation of CCTV in lockups for transparency.
- **In Re: Custodial Violence (2020):** Supreme Court asked states to file compliance reports on CCTV installation.

Way Forward:

- **Anti-Torture Legislation:** Enact a specific law defining custodial torture and mandating time-bound trials.
  - Inspired by 273rd Law Commission Report

and global practices.

- **Independent Oversight:** Strengthen NHRC with suo-motu powers, mandatory reporting, and follow-up on police abuse cases.
- **Ratify UNCAT:** Bring legal and procedural reforms to meet international human rights standards.
- **Strengthen Forensic & CCTV Evidence:** Use tech-enabled tracking (e.g., body cams, digital case logs) to reduce evidence tampering.
- **Police Reforms:** Implement the Supreme Court's Prakash Singh guidelines—fix tenure, separate investigation and law & order duties.
- **Special SC/ST Safeguards:** Enforce SC/ST (Prevention of Atrocities) Act provisions during detention and custodial procedures.
- **Fast-track Courts:** Set up special benches for custodial death trials to ensure timely justice and deterrence.

Conclusion:

Custodial deaths reflect not only institutional apathy but also a deep-rooted disregard for constitutional values. Addressing this requires structural reforms, stronger legal safeguards, and a shift towards rights-based policing.

PEERING INTO INDIA'S DIGITAL DIVIDE

Context:

The Comprehensive Modular Survey: Telecom 2025 (CMS) by the NSS reveals deep insights into India's digital usage patterns, highlighting a shift from basic connectivity to meaningful digital empowerment.

About Peering into India's Digital Divide:

What is Digital Divide?

- **Definition:** Digital divide refers to the **unequal access to digital technologies** (like smartphones, Internet, ICT skills) across different population groups.
- **Key Features:**
  - **Access Gap**: Variations in mobile ownership and internet availability.
  - **Usage Gap:** Differences in the purpose (e.g., entertainment vs. education) of digital use.
  - **Skill Gap:** Inability to use ICT productively, like word processing or cybercrime reporting.
  - **Gender Gap:** Lower digital empowerment among women and girls.

Trends in Digital Divide in India (NSS 2025):

- **Access Trends**:
  - 97.1% youth use mobile phones; 73.4% own them.
  - Ownership: Urban youth – 82%, Rural – 69.3%, Males – 83.3%, Females – 63%.
- **Usage Trends**:
  - 91.3% of young women now use Internet (up from 77.1% in 2022).
  - 30.4% use Internet only for entertainment and higher among females (36%).
- **Skill Trends**:
  - 85.1% can send attachments, only 32.2% created presentations, 22.9% drafted documents.
  - Online banking: 68.7% youth, Female (57.5%) vs. Male (79.3%); Rural (63.4%) vs. Urban (79.7%).
- **Connectivity**:
  - 91.6% urban households vs. 83.3% rural households have Internet.
  - Only 7.2% of households have fibre-optic connections; rural share only 3.2%.

First-Generation Digital Inclusion Reforms

- BharatNet **Expansion:**BharatNet connected over 1.7 lakh Gram Panchayats with optical fibre, enabling digital services in remote villages. It became the backbone for e-governance, e-health, and online education in rural areas.
- **Digital India Framework:**The Digital India Mission aimed at universal access through CSCs, digital lockers, and online government services.
- PMGDISHA **Literacy Drive:**Pradhan Mantri Gramin Digital Saksharta Abhiyan aimed to train 6 crore rural individuals in basic digital skills.
- **UPI and JAM Trinity:**The Jan Dhan–Aadhaar–Mobile linkage and UPI enabled low-cost, real-time digital payments.

Outcomes of First-Gen Reforms:

- **Universal Mobile Usage:**About 97% of youth now use mobile phones for calls and internet, including 92.7% in rural areas. This marks a near-saturation of basic digital access across India.
- UPI's Dominance **in Payments:**UPI usage among youth touched 80.7%, while Net banking remained low at 0.7%. This shows India's fintech adoption is mobile-first and mass-based.
- **Mobile-Centric Internet:**Smartphones with cheap data packs made mobile internet the primary access tool in rural India. Desktop or broadband-based access remains limited.
- **Rise in Female Internet Users:**Female internet usage in rural India rose from 77.1% to 91.3%,

indicating a major shift in gender access. This reflects a quiet digital empowerment underway.

Persistent Shortcomings in Digital Divide:

- **Gender Gap in Ownership:**Only 56.9% of rural young women own mobile phones, compared to 81.2% of men. Access without ownership limits autonomy and private use.
- **Lack of Productive Skills:**Just 32.2% of youth created a digital presentation, only 22.9% drafted a document. Digital use is skewed towards consumption, not creation.
- **Dependence on Male Relatives:**Women often rely on family phones, leading to restricted use and compromised privacy. This dependence hinders empowerment and equal participation.
- **Low Civic Tech Awareness:**Only 26.9% of youth know how to file cybercrime complaints; rural and female awareness is below 22%. This limits their ability to seek redress online.
- **Weak Financial Fluency:**Just 18.8% of youth use both UPI and Net banking. Multimodal digital banking literacy remains underdeveloped, especially in rural areas.

Way Forward: Second-Generation Inclusion

- **From Access to Empowerment:**Focus must shift from access to enabling youth to use digital tools creatively and productively. This includes skill-building, problem-solving, and content creation.
- **Women-Centric Interventions:**Train SHGs and rural women to use mobile apps for business, education, and healthcare. Digital tools must serve as income and knowledge multipliers.
- **Last-Mile Infrastructure Push:**Strengthen fibre-to-village networks and set up school-based and panchayat-level digital hubs. Public Wi-Fi and community centres can support access.
- **Digital in School Curricula:**ICT training, document creation, presentations, and cyber hygiene must be taught in schools. It will ensure productive engagement from an early age.
- **Expand Digital Financial Skills:**Train women and rural youth in using Net banking, UPI, and secure wallets. Financial fluency beyond UPI is crucial for true participation.
- **Localized Awareness Campaigns:**Use local languages to promote internet use for health, e-learning, job search, and governance. Content should match rural needs and cultural context.

Conclusion:

India has achieved near-universal digital access, but meaningful use remains unequal. A second-generation push must focus on ownership, skills, and autonomy to truly bridge the divide. A mobile phone in every hand must also mean equal power in every mind.

PYQ:

1. What is the status of digitalization in the Indian economy? Examine the problems faced in this regard and suggest improvements. (2023)

SWACHH SURVEKSHAN 2024–25

Context:

Ahmedabad emerged as the cleanest big city in the Swachh Survekshan 2024–25. The awards were conferred by President Droupadi Murmu during a national felicitation event.

About Swachh Survekshan 2024–25:

- **Conducted by:** Ministry of Housing and Urban Affairs (MoHUA).
- **Objective:** Promote competitive spirit among cities for cleanliness and sanitation.
- **Framework:** Based on "One City, One Award" and includes parameters like GFC star rating, source segregation, toilet access, and beautification.
- **Participation:** 4,500+ cities, 14 crore citizens engaged via face-to-face, apps, and digital platforms.
- **New Additions:** "Super Swachh League" and revamped categorization across five population segments.

Winners 2024–25:

- **Cleanest Big Cities (10 lakh+):** Ahmedabad (1st), Bhopal (2nd), Lucknow (3rd).
- **3–10 Lakh Category:** Mira-Bhayandar (1st), Bilaspur (2nd), Jamshedpur (3rd).
- **Best Ganga Town:** Prayagraj.
- **Best Cantonment Board:** Secunderabad Cantonment.
- **SaifaiMitra Surakshit Shehar (Sanitation Worker Safety):** Visakhapatnam, Jabalpur, Gorakhpur.
- **Super Swachh League Inductees (23 cities):** Indore, Surat, Navi Mumbai, Vijayawada, Chandigarh, Mysore, etc.

About Super Swachh League (SSL):

- **What It Is?**
  - The **Super Swachh League** is a new category introduced in *Swachh Survekshan 2024–25* to honour cities showing **sustained**

excellence in urban sanitation and cleanliness over multiple years.

- **Objective:** To create a premier league of consistently high-performing cities across population brackets, promoting competitive excellence and peer benchmarking.
- **Eligibility Criteria:**
  - Cities must have a **minimum Garbage Free City (GFC) star rating**, ideally 3-star or above.
  - Must consistently rank high in Swachh Survekshan across key parameters like door-to-door waste collection, source segregation, ODF++ status, and citizen engagement.
  - Population-based segmentation:
    - Above 10 lakhs (e.g., Ahmedabad, Indore, Surat).
    - 3–10 lakh (e.g., Noida, Chandigarh, Mysuru).
    - Below 3 lakh and below 1 lakh (with defined benchmarks).

Key Trends Highlighted:

- **Rise of Mid-Tier Cities:** Cities like Bilaspur and Jamshedpur are outperforming major metros in sanitation metrics, showing decentralised progress.
- **3R Push (Reduce, Reuse, Recycle):** The survey promoted 3R as a guiding principle, integrating sustainability into everyday urban behaviour.
- **Scientific Waste Management:** 12 cities earned 7-star and 22 cities secured 5-star Garbage Free City certifications, reflecting improved waste processing.
- **Inclusivity for Small Cities:** Revised scoring methods enabled towns with populations below 1 lakh to compete fairly with big cities.
- **Public Engagement:** Over 14 crore citizens participated via surveys, apps, and community events—an all-time high.

Best Practices Recognized:

- **Waste-to-Wealth Innovations:** Artistic tokens made from recycled waste were gifted to dignitaries, symbolising creative reuse
- **Peer Mentorship Model:** Top 78 cities will each mentor one underperforming city under the "Each One Clean One" initiative.
- **Dumpsite Remediation Drive:** A focused 1-year campaign starting Aug 15, 2025, will clean up legacy waste and reclaim urban land.
- **Clean Kumbh Management:** Prayagraj efficiently managed sanitation for 66 crore devotees at the Maha Kumbh, showcasing mega-event waste planning.
- **Sanitation Worker Safety**: Cities like Gorakhpur, Jabalpur, and Visakhapatnam were honoured for ensuring dignity and safety for Safai Mitras.

Significance:

- **Urban Transformation:** Survey results indicate a shift in citizens' mindset—from compliance to commitment toward cleanliness.
- **Youth & Job Creation:** The focus on circular economy has led to startups, SHG enterprises, and green employment in waste management.
- **Benchmarking Tool:** The survey serves as a performance mirror, pushing cities to improve service delivery and adopt innovation.
- **Viksit Bharat 2047 Vision:** Clean cities are critical to the broader goal of a developed India by 2047.
- **Women & SHG Engagement**: Women-led groups and school campaigns are playing key roles in zero-waste and segregation drives.

Conclusion:

Swachh Survekshan 2024–25 showcases India's urban sanitation shift from compliance to commitment. It celebrates city-level innovation, grassroots participation, and national resolve for a cleaner, sustainable future. Cleanliness is no longer a mission — it is becoming civic culture.

Topics: India and its neighbourhood- relations.

INDIA–TALIBAN 2.0 ENGAGEMENT

Context:

India held back-to-back high-level meetings with Taliban representatives including Foreign Secretary-level talks and EAM Jaishankar's call with Amir Khan Muttaqi.

- Russia's formal recognition of Taliban adds momentum to India's cautious but deepening engagement.

About India–Taliban 2.0 Engagement:

Geopolitical Context of India–Afghanistan Relations

1. **From Hostility to Opportunity:** During Taliban's first regime (1996–2001), India faced hostility and Pakistani terror proxies operating from Afghan soil. However, post-2021, the Taliban appears more open to India's engagement, especially as its ties with Pakistan sour.
2. **India's Humanitarian Soft Power:** India provided $3 billion+ in aid projects: dams, hospitals, Parliament building, and education. It was among the first to send humanitarian relief post-U.S. withdrawal, building goodwill and strategic trust.
3. **Pakistan–Taliban Breakdown: India's Strategic Window:** Taliban's refusal to curb Tehrik-e-Taliban Pakistan (TTP) has soured its ties with Islamabad. India uses this opening to strengthen bilateral ties and weaken Pakistan's leverage in Afghanistan.
4. **India's Multi-Ring Strategy:** As per **Shafiee's model**, Afghanistan lies in India's 'first ring'—the immediate neighbourhood where India aims for strategic primacy to block external influences, especially Pakistan and China.

India's Strategic Interests in Engaging the Taliban

- **Counter-Terrorism and Border Security:** Taliban's promise to prevent anti-India activities offers India a chance to deny Pakistan a terror foothold via Afghan territory.
- **Access to Central Asia via Afghanistan:** Afghanistan serves as a geographic bridge to Central Asia. With Pakistan denying overland routes, the Chabahar port and Afghan corridor offer India economic and strategic alternatives.
- **Energy Security and Connectivity:** Central Asia holds untapped energy reserves. India's expanded connectivity through Afghanistan supports its long-term energy diversification goals.
- **Containment of China–Pakistan Axis:** Afghanistan provides a counterbalance to the China–Pakistan Economic Corridor (CPEC). A Taliban-friendly India denies Pakistan strategic depth.
- **Regional Stability and Indian Security Doctrine:** According to Barry Buzan, insulating states like Afghanistan play a role in regional order. A stable, India-engaged Afghanistan helps consolidate a South Asia–centric security framework.

Challenges in Engaging Taliban 2.0:

- **Legitimacy Concerns:** Taliban remains diplomatically isolated and under UN sanctions. Full recognition remains politically sensitive, especially for democratic India.
- **Human Rights and Women's Issues:** Taliban's regressive stance on women and minorities presents ethical and diplomatic dilemmas for India.
- **Pakistan's Disruption Strategy:** India's proactive presence in Afghanistan may escalate proxy conflicts, especially given Pakistan's support for rival factions.
- **China's Expanding Footprint:** China's investments in Afghanistan and its BRI agenda pose economic competition and security concerns.
- **Taliban's Internal Factions:** The regime's internal instability and ideological divides complicate negotiations and predictability in India–Afghan ties.

Strategic Calculations: India's Role in Post-2021 Afghanistan

Strategic Objective	India's Approach
Prevent terror spillover	Intelligence and security dialogue with Kabul
Counter Pakistan's influence	Build soft power, align with anti-TTP stance
Improve Central Asia access	Invest in connectivity (Chabahar, Zaranj–Delaram highway)
Assert regional leadership	Actively engage in SCO, Moscow Format, Quad on Afghanistan
Secure development gains	Continue project-based diplomacy and humanitarian aid

Way Forward:

- **De Facto Engagement without Recognition:** Continue political dialogue and aid while withholding formal recognition until global consensus evolves.
- **Layered Diplomacy:** Engage Taliban while supporting Afghan civil society, women's rights, and education through indirect channels (e.g., UN, NGOs).
- **Regional Security Coordination:** Deepen partnerships with Iran, Central Asia, and Russia to counterbalance Taliban volatility and China–Pakistan axis.
- **Strategic Use of Chabahar:** Expedite infrastructure around Chabahar for seamless transit to Afghanistan and Central Asia.
- **Prevent Radicalisation Spillover:** Monitor cross-border networks and use intelligence partnerships to prevent infiltration of extremism into India.

Conclusion:

India's engagement with Taliban 2.0 reflects a strategic shift from idealism to realism. While challenges

remain—ranging from human rights to regional rivalries—New Delhi's calibrated diplomacy in Afghanistan aims to safeguard its long-term interests in security, connectivity, and regional leadership. As Afghanistan transforms into a geopolitical crossroads, India must walk the tightrope of engagement with caution, conviction, and consistency.

INDIA-MALDIVES RELATIONS

Context:

During Prime Minister of India official visit to the Maldives, 8 key bilateral agreements were signed, covering digital payments (UPI), debt relief, fisheries, infrastructure, and a ₹4,850 crore Line of Credit, marking a renewed phase in India-Maldives relations.

About India-Maldives relations:

India and Maldives share deep-rooted **ethnic, linguistic, cultural, and commercial ties**, reinforced by proximity in the Indian Ocean. Maldives is a critical part of India's **"Neighbourhood First"** and **SAGAR (Security and Growth for All in the Region)** policy frameworks.

Recent Outcomes:

8 Key Agreements Signed:

- **Debt Relief:** India agreed to **reduce Maldives' annual repayment burden by 40%**.
- **₹4,850 Cr Line of Credit:** For infrastructure aligned with Maldives' development goals.
- **UPI and RuPay Integration:** To expand **digital connectivity** and promote **local currency trade**.
- **Fisheries Cooperation:** Strengthened ties in livelihood and marine economy.
- **3,300 Housing Units:** Handover of Indian-financed social housing in Hulhumalé.
- **Security Assistance:** India gifted **72 vehicles and defence equipment**.
- **Climate & Disaster Partnership:** Joint cooperation on **resilience and green energy**.
- **FTA and Investment Talks:** Agreed to advance discussions on **Bilateral Investment Treaty** and **Free Trade Agreement**.

Significance of the Visit:

- Symbolically reversed the "**India Out**" rhetoric under Muizzu's earlier stance.
- Reaffirmed India's role as **first responder and development partner**.
- Anchored India's **strategic interests in the Indian Ocean Region (IOR)**.
- Strengthened **people-to-people ties** through housing, education, and health cooperation.

Historical Background:

- India was **first to recognize Maldives' independence in 1965**.
- In **1988**, India averted a coup in Maldives under **Operation Cactus**.
- Assistance during **2004 Tsunami**, **2014 Malé water crisis**, and **COVID-19 pandemic** elevated India's stature as a **reliable partner**.

Key Areas of Cooperation:

- **Defence & Security:**
  - **Joint exercises:** Ekuverin, Ekatha, Dosti.
  - **Projects:** MNDF Training Centre, Coastal Radar System, Ekatha Harbour, UTF Harbour.
  - India has trained **over 1,500 MNDF officers** and provided extensive **MEDEVAC and HADR support**.
- **Development Assistance:**
  - **Major projects:** Greater Malé Connectivity, Hanimaadhoo Airport, MIFCO cold storage, IGMH hospital.
  - **47 High Impact Community Development Projects (HICDPs)** implemented.
- **Trade & Investment:**
  - India is Maldives' **largest trading partner (2023)** and bilateral trade at **$548 million (2023)**.
  - **Key exports:** food, medicine, construction materials.
  - **Key imports:** scrap metal, seafood.
  - UPI and RuPay integration to boost **fintech connectivity**.
- **Tourism & Culture:**
  - India was top tourist source in **2021–23**, with **over 2 lakh arrivals annually**.
  - Open skies agreement signed to promote connectivity.
- **Education & HRD:**
  - **ICCR scholarships**, **ITEC training**, teacher exchange.
  - **New institutions:** Police College, Technical Institutes, Malé ICT projects.

Challenges & Differences:

- **"India Out" Sentiment:** The nationalist campaign led by President Muizzu earlier strained bilateral trust, portraying Indian military presence as a threat

to sovereignty.

- **Chinese Economic Leverage:** Maldives' rising debt to China through BRI-linked projects creates strategic concerns for India over long-term influence in the region.
- **Sovereignty Sensitivities:** Indian-backed defence infrastructure and troop presence are occasionally viewed by Maldivian opposition as interference in internal affairs.
- **Political Instability in Maldives:** Frequent leadership changes and coalition politics often shift the Maldives' foreign policy priorities, affecting bilateral consistency.
- **Delayed Project Execution:** Administrative hurdles and political resistance in Maldives have slowed Indian-funded infrastructure projects, affecting credibility and local sentiment.

Way Forward:

- Ensure **project delivery timelines** to build long-term credibility.
- Institutionalise **economic and security dialogues** to handle geopolitical shifts.
- Deepen **blue economy and climate resilience** collaboration.
- Promote **youth, education, and civil society exchanges** to sustain trust.
- Align Maldives more closely with **Indo-Pacific stability frameworks**.

Conclusion:

India–Maldives ties have evolved into a **robust developmental and strategic partnership**. PM Modi's 2025 visit reinforced India's commitment to the Maldives' growth and regional stability. Sustained diplomacy, trust-building, and people-centric initiatives will define the next chapter.

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

INDIA & THE GLOBAL SOUTH

Context:

Indian Prime Minister five-nation touracross Ghana, Trinidad & Tobago, Argentina, Brazil, and Namibia marked a strategic outreach to the Global South, strengthening India's leadership in the developing world.

About India & the Global South:

- **What is Global South?**
  - The **Global South** refers to a grouping of developing and emerging countries—mostly in **Asia, Africa, Latin America, and Oceania**—that share **similar developmental challenges** and seek **greater representation** in global decision-making platforms.
- **Origin:**
  - The term **emerged in the 1960s**, first used by Carl Oglesby during the Vietnam War.
  - Gained prominence with the **Brandt Line** (1980), which demarcated the wealthy North from the underdeveloped South.
  - Popularised in recent decades due to dissatisfaction with the global governance system, especially **after COVID-19, Ukraine war, and climate crises**.

Key Characteristics:

- **Geographic Fluidity**: Not strictly southern—includes countries like India and China in the northern hemisphere.
- **Economic &Political Marginalisation:** Limited voice in global institutions like UN, IMF, and World Bank.
- **Development Priorities:** Focused on poverty reduction, food and energy security, climate justice, and equitable trade.
- **Institutional Platforms:** Represented by G77 (134 countries), Non-Aligned Movement (120 nations), and India-led Voice of the Global South summits.

Key Challenges to the Global South:

- **Climate Vulnerability:** Developing nations bear the brunt of climate change despite low per capita emissions.

  E.g., African nations contribute <4% to global CO_2 emissions but face severe climate shocks.
- **Debt Distress:** Many nations face external debt burdens, worsened by COVID-19 and global inflation.

  E.g., Sri Lanka's economic crisis and Zambia's debt default highlight structural fragility.
- **Resource Weaponisation:** Strategic minerals like lithium and rare earths are monopolised, limiting access to green energy tech.

  E.g., China controls 70% of rare earth processing globally.
- **Digital Inequality:** Lack of digital infrastructure widens the **AI and fintech divide** between North and South.
- **Geopolitical Marginalisation:** The Global South lacks **permanent representation** in key global institutions like the UNSC.

India's Role in the Global South:

- **Diplomatic Voice:** India hosted **Voice of the Global South Summits (2023 & 2024)** and backed **African**

Union's G20 membership.
    - **E.g.**India's G20 Presidency in 2023 amplified Southern concerns.
- **Strategic Partnerships:**
    - **Ghana**: Rare earth mineral mining, maritime security
    - **Argentina**: Lithium exploration deal via KABIL in Catamarca
    - **Namibia**: UPI fintech rollout, biofuels, and critical minerals
    - **Brazil**: Defence deals, including interest in Akash missile system
- **Cultural Diplomacy:** PM Modi's **addresses to foreign parliaments**, yoga promotion, and diaspora engagement boost India's **soft power**.
- **Balanced Foreign Policy:** India has **hedged its position on Gaza and Iran** at BRICS, retaining strategic autonomy while retaining Global South trust.
- **Technology & Infrastructure Export:** Initiatives like **Digital Public Infrastructure (UPI, telemedicine)** and support for climate-resilient infra via **CDRI** are bridging divides.

Way Ahead:

- **Champion Multilateral Reform:** India must lead efforts for **UNSC, WTO, and IMF reforms** to reflect Global South aspirations.
- **Secure Equitable Mineral Access:** India should **de-risk mineral supply chains** through strategic investments in Africa and Latin America.
- **Expand South-South Finance:** Use platforms like **BRICS Bank** and **ISA** to finance clean energy, tech, and health projects.
- **Institutionalise Voice of Global South:** Create a permanent **Global South forum**, led by India, to coordinate positions in global summits.
- **Deepen Regional Ties:** Strengthen ties with **CARICOM, AU, ECOWAS**, and **Mercosur** to promote shared development agendas.

Conclusion:

India's renewed outreach signals its **transition from aid receiver to agenda setter** in the Global South. Through strategic diplomacy, economic cooperation, and cultural leadership, India is positioning itself as a **trusted partner in a multipolar world**.This momentum must now translate into **lasting institutions and inclusive governance reforms**.

INDIA–UK SIGN COMPREHENSIVE ECONOMIC AND TRADE AGREEMENT (CETA)

Context:

India and the United Kingdom signed a historic **Comprehensive Economic and Trade Agreement (CETA)** and endorsed a long-term strategic blueprint titled **India–UK Vision 2035**, aimed at strengthening bilateral relations across trade, defence, technology, education, and climate action.

About India–UK sign Comprehensive Economic and Trade Agreement (CETA):

What is the India–UK CETA?

- A **Free Trade Agreement (FTA)** granting **zero-duty access on 99% tariff lines** for Indian exports to the UK.
- Covers goods, services, mobility, investment, and social security exemptions under the **Double Contribution Convention (DCC)**.
- Designed to empower labour-intensive sectors, MSMEs, professionals, women, and youth.

Key Provisions of CETA:

1. Goods and Market Access:

- **Zero-duty access** for 99% of tariff lines covering 100% of India's trade value with the UK.
- Major boost to **textiles, gems & jewellery, leather, toys, marine products**, and **processed food** (tariff cut from 70% to 0%).
- Sensitive sectors like dairy protected under **exclusion lists**.

2. Services and Mobility:

- Enhanced access for **IT, financial, legal, education, architecture, and consulting services**.
- Liberalised visa norms for Contractual Service Suppliers, Intra-Corporate Transferees, and Independent Professionals.
- Mutual recognition of **professional qualifications** in healthcare, engineering, etc.

3. Double Contribution Convention (DCC):

- **Exemption from UK social security payments** for Indian professionals for 3 years.
- Boosts take-home salary and competitiveness of Indian firms abroad.

4. Inclusive Growth Focus:

- Provisions targeting **MSMEs, women entrepreneurs, artisans, farmers, youth**.
- Access to **UK's $63.4 billion agricultural market** for Indian products like spices, tea, coffee, fruits, meat, and dairy (excluding sensitive items).
- Dedicated SME contact points, digital trade facilitation, and **paperless customs**.

About India–UK Vision 2035:

India–UK Vision 2035 outlines a **comprehensive strategic roadmap** built on five pillars: Growth, Technology, Defence, Climate, and Education.

1. Growth and Jobs

- Doubling bilateral trade from $56 billion by **2030**.
- Enhanced investment via **BIT**, **UK-India Infrastructure Financing Bridge**, and **British International Investment (BII)**.
- Legal, financial, insurance and asset management sectors to gain from harmonised regulations.

2. Technology and Innovation

- Joint centre for **AI**, collaboration on **6G**, **semiconductors**, **biotech**, and **cybersecurity**.
- India–UK **Critical Minerals Guild** for secure green tech supply chains.
- Boost to startups through **catapults, incubators, and biofoundries**.

3. Defence and Security

- **10-Year Defence Industrial Roadmap** covering joint R&D in **electric propulsion, underwater systems**, and **directed energy weapons**.
- Elevated **2+2 dialogue**, expanded military exercises, and counter-terror cooperation.
- UK's logistic reliance on India in **Indian Ocean Region (IOR)**.

4. Climate and Clean Energy

- Joint action on **climate finance, carbon markets, offshore wind**, and **nuclear collaboration (SMRs)**.
- Support for **ISA**, **OSOWOG**, **ZEVTC**, and blue carbon research.
- Promotion of **Net Zero Innovation Partnership** and **agroforestry under India-UK Forest Partnership**.

5. Education and People-to-People Ties

- Opening of **UK university campuses in India**, dual degree programs.
- Green Skills Partnership to bridge climate-tech skill gaps.
- Implementation of **Young Professionals Scheme** and **mutual recognition of qualifications**.

Strategic Significance for India:

Sector	Benefits to India
Trade	Doubling exports, duty-free access, expansion of MSME base
Employment	Job creation in textiles, IT, food processing, and engineering
Youth & Mobility	Enhanced pathways for skilled migration & global careers
Innovation	AI, bio-manufacturing, 6G, quantum, and green hydrogen collaborations
Climate Goals	Green finance, clean tech access, carbon trading schemes
Defence	Boost to self-reliance through co-development in advanced defence tech
Multilateral Reform	Joint stance on UN, WTO, IMF reforms

Conclusion:

India–UK CETA and Vision 2035 mark a watershed moment in bilateral ties—linking trade, mobility, innovation, and strategic collaboration into a unified framework. With inclusive growth, sustainability, and technological leadership at its core, this partnership is set to position India as a key global player in the 21st century.

GENERAL STUDIES – 3

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

ADOPT FORMALISATION TO POWER PRODUCTIVITY GROWTH IN INDIA'S MANUFACTURING SECTOR

Context:

A recent study based on ASI data (1999–2019) shows that contractualization in India's formal manufacturing sector has risen from 20% to 40.7%, primarily driven by cost-avoidance rather than flexibility or skills, thereby harming long-term productivity growth.

About Adopt Formalisation to Power Productivity Growth in India's Manufacturing Sector**:**

Core Issue:

India's formal manufacturing is experiencing an **informalisation within formal structures**, where contract labour is increasingly used not for enhancing efficiency or acquiring skills, but to reduce wage costs and bypass labour laws.

Key Findings from the Study:

1. **Rising Contractualization:**
   - Contract labour in manufacturing doubled to **40.7%** by 2022–23.
   - This trend cuts across all sub-sectors, including large firms.
2. **Wage Disparities and Exploitation:**
   - Contract workers earn **14.47% less** on average than regular workers.
   - In large enterprises, wage gaps widen to **31%**; overall labour costs are **24% lower** for contract workers.
3. **Severe Productivity Gaps:**
   - **31% lower productivity** in contract labour-intensive (CLI) firms than regular labour-intensive (RLI) ones.
   - Gap widens to **42%** in small labour-intensive CLI firms.
   - **High-skill or capital-intensive CLI firms (only 20%)** show minor productivity gains (5–20%).
4. **High Turnover, Low Training:**
   - Use of short-term contracts reduces workforce stability, **discourages skilling and innovation**, creating **long-term productivity losses**.

Structural Issues in Contractualization:

- **Misaligned Incentives in Contracting:** Third-party contractors often have no stake in long-term outcomes, leading to a principal-agent problem where firms and contractors pursue conflicting goals.
- **Erosion of Work Discipline and Quality:** Short-term job contracts reduce worker accountability, encouraging shirking behaviour and poor-quality output—classic manifestations of moral hazard.
- **Deliberate Bypass of Labour Protections:** Contractualization is misused to evade the Industrial Disputes Act, 1947, excluding workers from safeguards on retrenchment, layoffs, and fair dispute resolution.
- **High Turnover and Training Disincentives:** The transient nature of contract work increases attrition, discouraging firms from investing in on-the-job training, innovation, or skill upgradation.
- **Weak Social Security and Welfare Gaps**: Contract workers are often denied access to EPF, ESI, or maternity benefits, worsening economic insecurity and perpetuating informalisation within formal enterprises.

Policy Challenges in Regulating Contractualization:

- **Stalled Execution of Labour Codes**: The Industrial Relations Code, 2020—meant to formalise fixed-term hiring without middlemen—awaits state-level adoption, delaying systemic reform.
- **Unregulated Expansion of Non-Permanent Jobs**: By enabling flexible hiring, the new labour codes risk institutionalising precarity unless complemented by robust regulatory oversight.
- **Union Pushback and Political Resistance**: Labour unions fear that increased hiring flexibility will erode collective bargaining rights, stalling reforms through political opposition and litigation.
- **Premature Withdrawal of PMRPY Incentives**: Schemes like PMRPY (2016–2022), which subsidised EPF contributions to promote formalisation, were discontinued before achieving sectoral saturation.
- **Poor Monitoring of Contractual Norms**: Labour inspections remain weak, especially in MSMEs, allowing rampant misuse of contract labour without accountability or employer penalties.

Policy Recommendations:

- **Implement Labour Codes Carefully:** Ensure fixed-

term contracts include basic benefits and rights to prevent disguised informalisation.

- **Incentivise Longer Tenures:** Offer social security contribution waivers or priority in government tenders for firms adopting longer fixed-term contracts.
- **Revive PMRPY with Enhancements:** Reintroduce the scheme with stronger accountability to promote formal hiring and reduce cost-based contractualization.
- **Link Formalisation with Skilling:** Provide subsidised access to skilling schemes (like PMKVY) only for firms with formal, stable employment contracts.
- **Disincentivise Excessive Contractualization:** Levy productivity-linked penalties or audit triggers if CLI usage exceeds thresholds in low-skill industries.

Conclusion:

In the long run, cost-driven contractualization undercuts labour productivity, innovation, and industrial stability. India's journey toward higher economic growth must therefore adopt genuine formalisation, skill-based hiring, and long-term workforce development. A balanced approach that combines labour market flexibility with job quality assurance is critical for transforming Indian manufacturing into a globally competitive sector.

8 YEARS OF GST

Context:

India marks 8 years of Goods and Services Tax (GST) implementation, with automation significantly improving IGST refund processing for exporters.

About 8 Years of GST:

What is GST?

- A **comprehensive, multi-stage, destination-based indirect tax** that subsumes major central and state taxes (excise, VAT, service tax).
- Aims to create a **unified national market** with seamless **input tax credit** and reduced tax cascading.

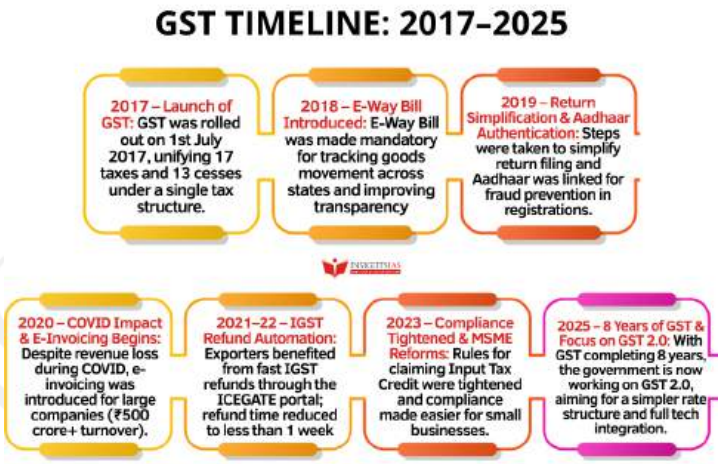
Launched On: 1st July 2017, following the enactment of the **Constitution (101st Amendment) Act, 2016.**

Key Features:

1. **Dual GST Model**: Centre levies CGST; States levy SGST.
2. **One Nation, One Tax**: Unified indirect tax structure for goods and services.
3. **Technology-Driven**: Uses GSTN for registration, return filing, and compliance.
4. **Input Tax Credit**: Allows credit of input tax across the supply chain.
5. **Zero-Rated Exports**: Ensures no tax burden on exports (via refund or LUT mechanisms).

Achievements in 8 Years:

1. **Widened Tax Base:** GST taxpayer base grew to over **1.45 crore by 2025**.
2. **Revenue Milestone:** Monthly GST collections averaged **₹1.65 lakh crore in FY25**, with a record high of ₹2.10 lakh crore in April 2025.
3. **Improved Refund Processing:** IGST refunds now processed within one week via Customs ICEGATE portal and ₹1.18 lakh crore refunded in FY25.
4. **Ease of Doing Business:** Automation has reduced refund time, improving export competitiveness.
5. **Common National Market:** Reduced tax barriers and logistics costs across states.



Shortcomings of GST:

1. **Refund Delays under GST Officers**: Refunds filed via GST portal can take **up to 90 days**, unlike automated IGST refunds (within 7 days).
2. **Tech-Compliance Gaps**: **Disparities between Customs and GST systems** hamper seamless verification.
3. **Complexity in Return Filing**: Technical glitches and reconciliation issues persist for small businesses.
4. **Compliance Burden**: Frequent notifications, rate changes, and portal issues increase procedural complexity.
5. **Limited Fiscal Autonomy for States**: States express concerns over revenue dependence on Centre.

Way Forward:

1. **Integrate GST and Customs Systems:** Real-time data sharing to **expedite cross-platform refund processing**.
2. **Enhance Automation for All Refunds:** Extend automated workflows to **GST officer-led refunds**.
3. **Simplify Compliance for MSMEs:** Introduce graded reporting and single-page returns for small taxpayers.
4. **Strengthen GST Appellate Mechanisms:** Ensure timely disposal of disputes for improved taxpayer confidence.

5. **Institutionalise GST 2.0:** Review rate structure, expand tax base (including fuel/alcohol), and **stabilize tax governance**.

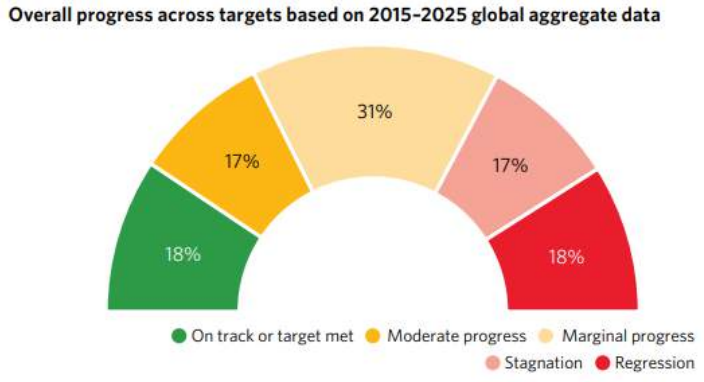
Conclusion:

Eight years of GST represent a transformational journey in India's indirect tax regime. While automation has streamlined exporter refunds, systemic and procedural gaps need urgent attention. To unlock its full potential, GST must evolve into a more agile, transparent, and taxpayer-friendly system.

UN SDG REPORT 2025

Context:

The UN SDG Report 2025, released at the High-Level Political Forum, warns that 35% of measurable SDG targets are stagnating or reversing, with five years left to 2030.



About Summary of UN SDG Report 2025:

1. **SDG 2: Zero Hunger**
   - Hunger affected **9.1%** of the global population in 2023 (~713–757 million people).
   - **2.33 billion people** faced moderate or severe food insecurity in 2023.
   - **Sub-Saharan Africa:** 23.2% hunger prevalence and **Southern Asia:** 281 million hungry.
2. **SDG 4: Quality Education**
   - **57% of targets** show no progress or are regressing.
   - School completion, foundational literacy, and gender parity remain unmet in many nations.
3. **SDG 6: Clean Water & Sanitation**
   - **2.2 billion** people lack safely managed drinking water.
   - **3.4 billion** people have no access to sanitation and **1.7 billion** lack hygiene access.
4. **SDG 8: Decent Work & Economic Growth**
   - **Half the targets** stagnated or regressed.
   - **57.8% of workers** globally are in informal employment.
   - Youth unemployment in 2024 stood at **12.9%**, 3× adult rate (3.7%).
5. **SDG 10: Reduced Inequalities**
   - Rising inequality across income, access to vaccines, digital divide, and climate vulnerability.
   - No significant redistribution mechanisms expanded post-COVID-19.
6. **SDG 14: Life Below Water**
   - **40% of targets** regressing.
   - Ocean acidification, marine pollution, and overfishing worsening.
   - Least funded SDG, as highlighted at **UN Ocean Conference 2025**.
7. **SDG 3: Good Health & Well-Being**
   - Maternal mortality and universal health coverage targets **stalled**.
   - Health systems under post-pandemic strain and chronic underinvestment.
8. **SDG 12, 15, 16 (Responsible Consumption, Life on Land, Peace & Justice)**
   - **40–42% of targets** off-track.
   - Forest loss, biodiversity erosion, institutional backsliding seen in many nations.

Negative Trends Identified:

- **Climate Crisis:** 2024 was the hottest year; WMO predicts an 80% chance of hotter years ahead, endangering food, water, and health security.
- **Extreme Poverty:** Over 800 million people remain extremely poor; SDG1 is off-track as 8.9% may still live in poverty by 2030.
- **Debt & Aid Decline: A** 7.1% fall in official aid in 2024 hampers SDG funding for low-income nations.
- **SDG Financing Gap**: A $4 trillion annual gap stalls SDG investments in developing countries due to limited access to affordable capital.

Positive Trends Identified:

- **HIV Infections:** Global HIV cases declined 40% since 2010, marking strong gains in SDG3 health targets.
- **Malaria Control:** 2.2 billion malaria cases averted and 12.7 million lives saved since 2000 through prevention and treatment.
- **Social Protection:** Coverage now reaches over 50% of the world population, advancing inclusive welfare goals.

Way Ahead: Roadmap for 2030:

- **Reform Global Finance Architecture:** Adopt the **Sevilla Commitment:** Expand multilateral lending, cut debt burdens.
- **Focus on Six Key Accelerators:**
  1. Transform food systems, ensure energy

access, promote digital transformation.

2. Expand inclusive education, create decent jobs, and protect climate/biodiversity.

- **Build Resilient Data Systems:** Implement the **Medellín Framework for Action** for data-driven SDG policies.
- **Target Most Affected SDGs:** Immediate action on SDG 2, 4, 6, 8, and 10 — with multilateral and domestic investments.
- **Urgent Multilateralism:** Recommit to **collective action** beyond national interest — especially in G20 and BRICS forums.

Conclusion:

The UN SDG Report 2025 paints a sobering picture of stagnation amid global crises. While there are islands of success, systemic transformation and urgent global cooperation are essential. Achieving the 2030 Agenda now hinges on political will, equitable finance, and inclusive governance.

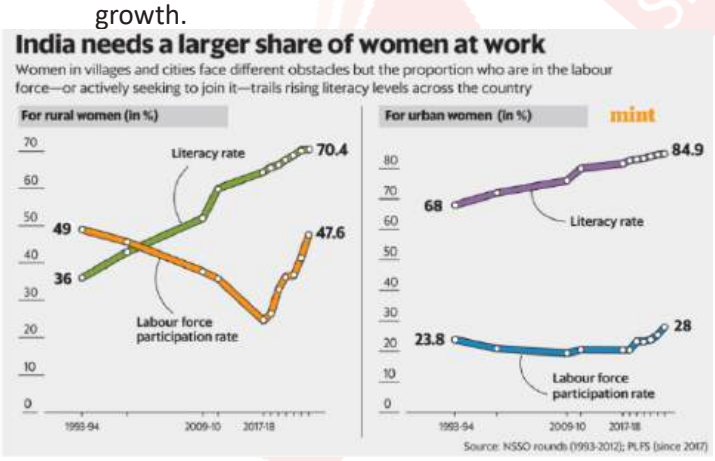
Topics: Inclusive growth and issues arising from it.

FEMALE LABOUR FORCE PARTICIPATION PARADOX IN INDIA

Context:

Despite India's high female literacy—especially in urban areas—labour force participation among women remains low.

- PLFS 2023–24 highlights a stark rural-urban disconnect and a widening literacy–employment gap, raising concerns over inclusive economic growth.



About Female Labour Force Participation Paradox in India:

Key Trends (PLFS 2023–24 & World Bank 2024)

- Urban female literacy: **84.9%**, yet FLFPR: **28%**
- Rural literacy–FLFPR gap: ~22%, Urban gap: ~57%
- National female literacy: **74.6%**, with a **33-point** employment gap
- India lies between developed (40-point gap) and developing (25-point gap) nations

Causes Behind Low FLFPR: Structural and Social Disconnect:

- **Urban Job Inflexibility:** Most urban jobs, especially in services, lack flexibility for family responsibilities, deterring women's sustained participation.
- **Mobility and Safety Concerns**: Unsafe public spaces and lack of reliable transport limit women's access to formal work environments in cities.
- **Informality and Job Insecurity:** A majority of urban women work in informal sectors with low pay and no benefits, leading to job exit during life events.
- **Childcare Deficit in Cities:** With 61.3% urban households being nuclear (NFHS-5), lack of crèches forces women to prioritize caregiving over employment.
- **Post-Maternity Workforce Dropout**: Absence of re-entry programs or part-time opportunities leads to permanent dropout post-childbirth, creating a "care penalty."

Why Rural FLFPR Is Higher Than Urban?

- **Flexible Work Options in Agriculture:** Agriculture and self-employment offer women work close to home with adaptable hours, improving participation.
- **Community-Based Childcare:** Extended families and rural kinship networks help women manage both work and caregiving responsibilities.
- **Work Out of Necessity:** Rural women work due to economic compulsion, not autonomy, contributing to higher, though less empowered, FLFPR.
- **Gender Norms Around Shared Labour:** In rural settings, work by women—even if unpaid or low-paid—is more culturally normalized and expected.
- **Crisis-Driven Employment:** Post-COVID rural employment saw a temporary rise due to loss of urban jobs and return migration, not durable inclusion.

Shocking Trend: Declining FLFPR Despite Progress

- **2005–2019 Paradox**
  - Fertility rates dropped, education rose—but FLFPR fell.
  - Higher incomes reinforced **gendered roles**—man as earner, woman as homemaker.
- **Post-COVID Spike in Rural FLFPR**
  - Driven by **distress employment** and fallback strategies, not systemic support.
  - Urban FLFPR still stagnant despite digitisation and economic revival.

Implications for Economy and Equity:

- **Loss of Demographic Dividend:** Underutilisation of half the population weakens India's long-term productivity and growth potential.
- **Stunted Social Development:** Low female employment slows gains in child health, nutrition, education, and gender equity.
- **Urban Middle-Class Retreat:** Higher incomes

reinforce traditional norms, causing women to withdraw from jobs when money isn't essential.

- **Global Competitiveness Hit:** India's low FLFPR limits its ability to compete with economies like Bangladesh or Vietnam on inclusive growth.
- **Equity and Justice Crisis:** Economic exclusion reinforces patriarchal structures and denies women equal access to opportunity and dignity.

Way Forward:

- **Public Childcare Infrastructure:** Expand anganwadis and urban crèches to support working mothers in both urban and peri-urban areas.
- **Flexible Employment Models:** Promote part-time work, gig platforms, and remote work to align with women's time and caregiving constraints.
- **Legislative Reform for Dignity at Work:** Ensure strong implementation of POSH Act and equal pay laws to create safe, respectful workplaces.
- **Norms Transformation Campaigns:** Launch nationwide efforts to normalize shared caregiving roles and women's right to work.
- **Urban Infrastructure for Inclusion:** Invest in safe transport, women-only toilets, and creche-linked workplaces to make cities gender-inclusive.

Conclusion:

India's low FLFPR is not merely a data problem—it reflects a deeper gendered social contract. As we progress towards a $5 trillion economy, ensuring equitable economic participation of women—both rural and urban—is no longer a social ideal but an economic imperative. Neither rural resilience nor urban infrastructure alone is enough. A combined structural overhaul and social shift is the need of the hour.

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

REDEEMING INDIA'S NUCLEAR POWER PROMISE

Context:

The Union Budget 2025–26 set a bold target of achieving 100 GW nuclear power capacity by 2047. This comes alongside a ₹20,000 crore allocation for developing Small Modular Reactors (SMRs), highlighting nuclear energy as a key pillar for a developed and net-zero India.

About Redeeming India's Nuclear Power Promise:

India's Nuclear Power: From Apsara to 2047:

- **Early Start and Isolation:** India launched Asia's first nuclear reactor (Apsara, 1956) and power plant (Tarapur, 1963), but post-1974 nuclear test and non-signature of NPT led to isolation and export bans.
- **Self-Reliance in PHWRs:** Indigenous development of 220 MW Pressurised Heavy Water Reactors (PHWRs) helped bypass dependency on enriched uranium.
- **NSG Waiver & International Entry:** Post-2008 Indo-U.S. civil nuclear deal and NSG waiver allowed India to import nuclear fuel and negotiate foreign reactor deals.

Why Nuclear Power Is Critical to India's Growth?

1. **Stable Base-load Supply:** Unlike solar or wind, nuclear provides uninterrupted, 24x7 power crucial for industrialisation and urban expansion.
2. **Low Carbon Emissions:** Nuclear emits negligible greenhouse gases, helping India meet its COP26 pledge of net-zero by 2070.
3. **Energy Security:** Reduces dependency on fossil fuel imports, especially coal and oil, enhancing strategic autonomy.
4. **High Energy Density:** A small volume of nuclear fuel generates large energy output, making it land- and resource-efficient.
5. **Scalability for Viksit Bharat:** Essential for achieving the 100 GW target by 2047, supporting India's $35 trillion economy goal.

Challenges Hindering Nuclear Expansion:

1. **Restrictive Legal Architecture:**
   - Atomic Energy Act, 1962 restricts nuclear operations to government entities.
   - CLNDA, 2010's supplier liability clause deters foreign/private participation.
2. **Regulatory Gaps:** Atomic Energy Regulatory Board (AERB) lacks legal independence and previous reform Bill lapsed in 2011.

3. **Financing Hurdles:**
    - Capital cost of $2 million/MW for PHWRs vs. <$1 million/MW for coal.
    - Lack of green financing eligibility; limited PPP/JV frameworks.
4. **Tariff and Jurisdictional Conflicts:** NPCIL tariffs are notified under the Atomic Energy Act and legal disputes with DISCOMs show need for clearer regulatory authority.
5. **Slow Negotiations with Foreign Partners:** U.S. and France reactor projects have seen negligible progress over 15 years.

Way Forward:

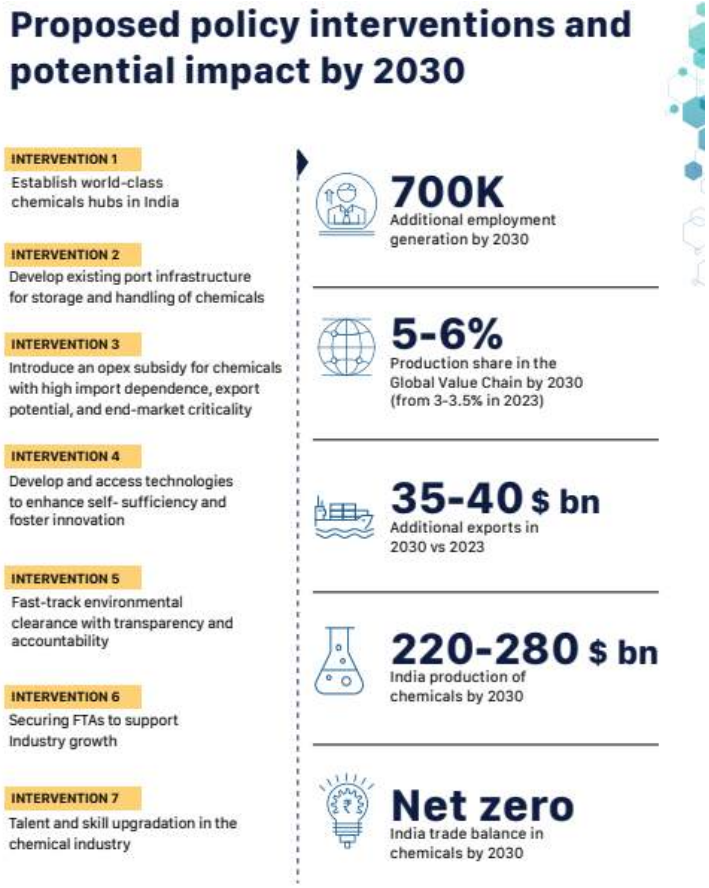
1. **Amend Atomic Energy and CLNDA Acts:**
    - Enable private and foreign JV participation.
    - Clearly define operator-supplier liability and ownership roles.
2. **Independent Nuclear Regulator:**
    - Revive and pass the Nuclear Safety Regulatory Authority Bill.
    - Ensure transparency and accountability in project licensing and safety.
3. **Green Financing and Incentives:**
    - Classify nuclear as low-carbon energy under "green" taxonomy.
    - Provide tax benefits, viability gap funding, and long-term PPAs.
4. **Small Modular Reactor (SMR) Deployment:**
    - Standardize 220 MW PHWR design for modular application.
    - Target industrial captive markets replacing 100 GW thermal base.
5. **Revive Foreign Partnerships and Fast-Track JVs:**
    - Accelerate talks with France (EPRs) and the U.S. (Westinghouse AP1000s).
    - Encourage strategic PSUs and large Indian corporates to join JVs (e.g., NTPC, Adani, Tata, Vedanta).

Conclusion:

India's civil nuclear journey must now transition from cautious evolution to bold reform. With strategic, legislative, and financial restructuring, nuclear energy can be India's backbone for green, secure, and inclusive growth. Achieving 100 GW by 2047 is not just an energy target — it's a cornerstone of India's aspiration for development and climate leadership.

NITI AAYOG REPORT ON CHEMICAL INDUSTRY

Context: NITI Aayog released its report "Chemical Industry: Powering India's Participation in Global Value Chains". The report envisions India becoming a global chemical powerhouse with 12% GVC share and USD 1 trillion output by 2040.



About Niti Aayog Report on Chemical Industry:

India's Chemical Industry: Current Landscape:

1. **Significant GDP Contributor:** India is the **6th largest chemical producer** in the world and 3rd in Asia, contributing **over 7% to manufacturing GDP**.

    E.g., The sector supports pharma, textiles, agriculture, and construction.
2. **Fragmented Sector:** Dominated by MSMEs, India's chemical sector lacks integrated value chains and modern infrastructure.

    E.g., Cluster-based growth is uneven across Gujarat, Maharashtra, and Tamil Nadu.
3. **Low Share in GVC:** India holds only **3.5% share in global chemical value chains**, reflecting poor backward integration and low export competitiveness. Trade deficit stood at USD 31 billion in 2023.
4. **High Import Dependency:** Imports of feedstocks and specialty chemicals from China and Gulf countries dominate.

    E.g., Over 60% of critical APIs rely on Chinese imports.
5. **Low R&D Investment:** India invests just **0.7% of industry revenue** in R&D, versus global average of 2.3%. This hampers innovation in green and high-value chemicals.
6. **Regulatory Bottlenecks:** Environmental clearances and procedural delays add to cost and time overruns.

    E.g., EC delays can take up to 12–18 months.
7. **Skill Shortages:** 30% shortfall in trained professionals in green chemistry, process safety, and nanotech.

E.g., ITI and vocational skilling have not matched industry demand.

Opportunities for India's Chemical Industry:

- **Green Chemistry Boom:** Global shift towards eco-friendly and sustainable chemicals opens up new markets.
- **Supply Chain Diversification:** Rising global distrust of China offers India a chance to emerge as an alternate supplier.
- **FTA Leverage:** FTAs with UAE, EU, and ASEAN can unlock tariff-free access to major markets.
- **Make in India Push:** Government support via PLI schemes, PCPIRs, and chemical parks provide ecosystem for scale.
- **Job Creation Potential:** The sector can create 7 lakh skilled jobs by 2030, especially in petrochemicals, research, and logistics.

Challenges Faced by the Sector:

- **Feedstock Vulnerability:** High dependence on crude oil and naphtha imports exposes firms to price shocks and supply risks.
- **Outdated Clusters:** Legacy clusters lack modern storage, safety systems, and waste treatment infrastructure.
- **High Logistics Cost:** Freight cost in India is **2–3 times higher** than global peers, reducing export competitiveness.
- **Regulatory Burden:** Lack of single-window clearances, frequent policy changes, and state-level conflicts delay investments.
- **Limited Industry-Academia Link:** Weak partnerships result in low patent generation and limited skill innovation.

NITI Aayog Recommendations:

- **World-Class Chemical Hubs:** Upgrade existing clusters, create empowered committees, and allocate Chemical Fund for infrastructure.

  E.g., Paradeep, Dahej, Vizag proposed as new mega-clusters.
- **Opex Subsidy Scheme:** Support incremental production based on import substitution and export potential.
- **Tech Access & R&D Boost:**
  - Interface body under DST for industry-academia collaboration.
  - Facilitate tech transfer from global MNCs.
- **Fast-Track Environmental Clearance:**
  - Simplify EC process via DPIIT audit committee.
  - Increase transparency and accountability.
- **Skilling & Industry Partnership:**
  - Expand ITIs and specialized institutes.
  - Create tailored courses in **polymer science, process safety**.
- **FTAs for Chemicals:**
  - Negotiate **chemical-specific clauses** in FTAs.
  - Ease documentation and origin proof mechanisms.

Conclusion:

India's chemical sector holds enormous potential to lead globally, but must overcome structural, regulatory, and skill-related hurdles. With bold reforms, strategic investments, and global partnerships, India can reduce its trade deficit and dominate the value chain. The NITI Aayog blueprint offers a clear, actionable path to turn this ambition into reality.

DRAFT PETROLEUM & NATURAL GAS RULES, 2025

Context:

The Ministry of Petroleum & Natural Gas has released the Draft Petroleum & Natural Gas Rules, 2025, aimed at modernising India's upstream oil and gas regulatory framework.

सत्यमेव जयते
पेट्रोलियम एवं प्राकृतिक गैस मंत्रालय
MINISTRY OF PETROLEUM AND NATURAL GAS

About Draft Petroleum & Natural Gas Rules, 2025:

Key Features of Draft Petroleum & Natural Gas Rules, 2025:

1. **Stabilisation Clause:** Protects exploration licensees from future hikes in taxes/royalties by allowing compensation or deductions.
2. **Third-Party Access:** Lessees must declare underutilised pipeline and facility capacity and

permit fair access under government oversight.

3. **Integration of Renewables:** Allows **solar, wind, hydrogen, and geothermal** projects within oilfields, ensuring synergy with decarbonisation.
4. **Environmental Norms:** Mandatory **GHG monitoring, carbon capture & storage (CCS)** frameworks, and **site restoration funds** with 5-year post-closure monitoring.
5. **Data Governance:** All operational data will be **owned by the Government of India**; external use requires prior approval and confidentiality of up to 7 years.
6. **Adjudication Mechanism:** A dedicated **Adjudicating Authority (Joint Secretary rank)** to resolve disputes, enforce compliance, and penalise violations.
7. **Contractual Reforms:** Revised **Model Revenue Sharing Contract (MRSC)** and **Petroleum Lease formats** include provisions for lease mergers, unitisation, and relinquishment.
8. **Replaces Outdated Laws:** To supersede the **Petroleum Concession Rules, 1949** and **PNG Rules, 1959**, and aligns with the amended **Oilfields Act, 1948**.

Importance of Petroleum & Natural Gas Industry in India:

- **Energy Security Backbone:** Accounts for over **35% of India's total energy mix**, meeting crucial transportation and industrial demand.
- **Employment & Investment:** Major driver of **FDI inflows**, domestic employment, and infrastructure development.
- **Strategic Significance:** Supports India's diplomacy through energy partnerships in **West Asia, Africa**, and **Latin America**.
- **Revenue Contribution:** Contributes significantly to the **exchequer through taxes, royalties, and dividends** from PSU oil firms.
- **Transition Enabler:** Forms the base for hybrid infrastructure that can later integrate **green hydrogen and CCS** systems.

Why Reforms Were Needed?

- **Outdated Framework:** The previous rules (1949 & 1959) lacked clarity on **modern exploration, renewables**, and investor protection.
- **Global Energy Transition:** India's upstream rules needed alignment with **net-zero goals** and global **climate commitments**.
- **Ease of Doing Business:** Investors demanded **regulatory clarity, fiscal stability**, and faster approvals.
- **Underutilised Assets:** Need to unlock shared use of **pipeline infrastructure** to avoid duplication and reduce costs.
- **Upcoming OALP Round X:** India's **largest-ever E&P bidding round** needed updated norms to attract global participation.

Implications of New Draft Rules:

- **Boost to Private Investment:** Stability clauses and simplified lease processes make India a more attractive E&P destination.
- **Green Energy Integration:** Aligns fossil fuel operations with **India's net-zero roadmap** via hybrid energy projects.
- **Transparency and Accountability:** Data ownership, third-party oversight, and adjudicating authority improve **sector governance**.
- **Operational Flexibility:** Encourages **unitisation of reservoirs**, infrastructure-sharing, and lease optimisation across blocks.
- **Climate Resilience:** Mandates CCS and GHG tracking, reinforcing India's global leadership on **sustainable fossil fuel use**.

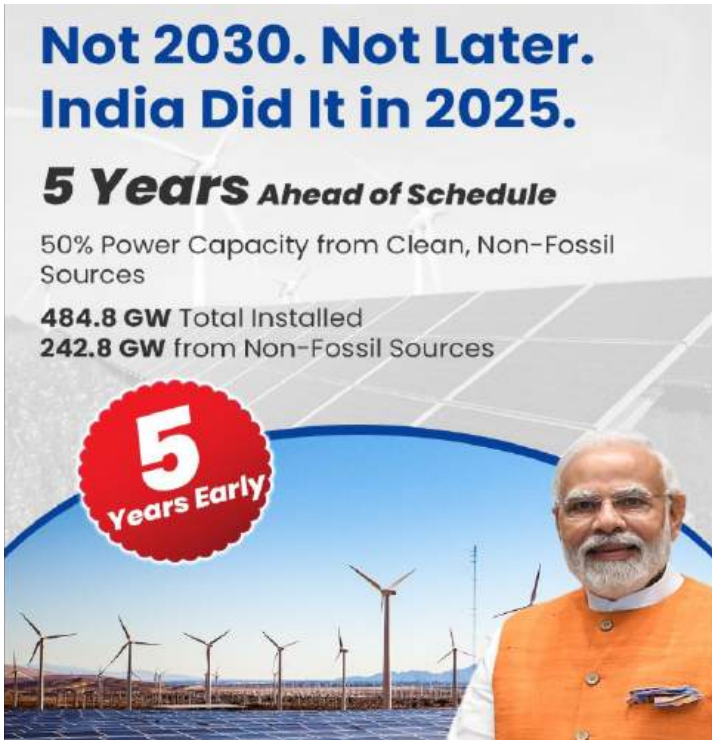
Conclusion:

The Draft Petroleum & Natural Gas Rules, 2025, represent a **structural overhaul** of India's upstream energy sector. They aim to make the ecosystem more **investor-friendly, environmentally compliant**, and **globally aligned**. As India targets both energy security and decarbonisation, these reforms offer a vital bridge for balanced growth.

INDIA HAS ACHIEVED 50% INSTALLED ELECTRICITY CAPACITY FROM NON-FOSSIL FUEL SOURCES

Context:

India has achieved 50% installed electricity capacity from non-fossil fuel sources, five years ahead of its 2030 Nationally Determined Contributions (NDC) target under the Paris Agreement.



About India has achieved 50% installed electricity capacity from non-fossil fuel sources**:**

What is the 50% Non-Fossil Fuel Capacity Milestone?

- It refers to half of **India's total installed power generation capacity** (484.82 GW) now coming from **non-fossil sources**—renewables, large hydro, and nuclear.
- As of June 30, 2025:
  - **Thermal (fossil-based):** 242.04 GW (49.92%)
  - **Non-fossil fuel total:** 242.78 GW (50.08%)
    - Renewable Energy (RE): 184.62 GW
    - Large Hydro: 49.38 GW
    - Nuclear: 8.78 GW

Factors Behind Success:

- **Political Commitment:** The central leadership, especially PM Modi and MNRE, provided consistent policy direction and funding for renewable energy expansion.
- **Private Sector Involvement:** Major domestic and foreign investments in solar, wind, and hybrid projects enabled rapid capacity growth with innovation.
- **State-Level Initiatives:** States like Gujarat and Tamil Nadu pioneered renewable parks and wind corridors, supporting decentralised implementation.
- **Digital Grid Infrastructure:** Smart meters, EV infrastructure, and digital load balancing enabled better integration of variable renewable sources.
- **International Cooperation:** Partnerships like ISA and JETP facilitated technology transfer, concessional financing, and global visibility.

Challenges & Issues:

- **Grid Stability Risks:** Renewable power variability stresses the grid; maintaining frequency balance requires storage and demand response mechanisms.
- **Land Use Conflicts:** Solar and wind projects sometimes displace farmlands, forests, or community lands, raising environmental and social concerns.
- **Storage Infrastructure Gaps:** Limited availability of large-scale battery or hydro storage constrains round-the-clock renewable supply.
- **Intermittency:** Solar and wind depend on weather and time, creating unpredictable generation patterns and reliability issues.
- **Cybersecurity:** As the power sector digitalises, it becomes vulnerable to hacking, malware attacks, and algorithmic disruptions.

Way Ahead:

- **Grid Modernisation:** Upgrade grids with AI-driven demand forecasting and two-way communication to manage distributed energy efficiently.
- **Storage Scaling:** Invest in Battery Energy Storage Systems (BESS) and pumped hydro to buffer intermittent renewables and ensure grid reliability.
- **Circular Economy:** Build recycling systems for solar panels, batteries, and wind turbines to reduce waste and resource dependency.
- **Energy Equity:** Promote rooftop solar and microgrids in rural, tribal, and underserved regions to ensure just energy access.
- **Green Hydrogen:** Scale up green hydrogen as a clean industrial fuel to decarbonise transport, refineries, and heavy industries.
- **Cyber Resilience:** Strengthen digital firewalls, real-time monitoring, and national cybersecurity protocols for energy infrastructure.

Conclusion:

India's early achievement of 50% non-fossil fuel capacity is a **proof of concept** that climate action and economic growth can go together. It strengthens India's global credibility as a clean energy leader. Now, the focus must shift to **resilient, equitable, and intelligent energy systems** for long-term sustainability.

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

CRITICAL MINERALS ARE A STRATEGIC ASSET

Context:

India's push for clean energy, electronics, and strategic technologies has placed critical minerals like lithium, cobalt, and rare earths at the center of policy discourse.

- **The National Critical Mineral Mission** (NCMM) and recent export restrictions by China have highlighted India's vulnerability and the need for self-reliance.

About Critical minerals are a strategic asset**:**

- **Definition:** Minerals essential to economic security and clean energy, with limited domestic availability

and high geopolitical risk.

- **Examples:** Lithium, Cobalt, Nickel, Graphite, Rare Earth Elements, Silicon.
- **Importance:** Core to **EVs, solar panels, semiconductors, wind turbines, defence, and telecom.**

Strategic Importance for India:

- **Energy Transition:** 100% import dependence on lithium, cobalt, and rare earths threatens India's EV and battery plans.
- **Tech Sovereignty:** Strategic autonomy in telecom, AI, defence depends on mineral access.
- **Geopolitical Leverage:** Reducing China-centric dependence helps assert India's position in the Indo-Pacific and Quad.
- **Industrial Ambitions:** PLI schemes for electronics, EVs, and solar require secure raw material input.
- **National Security:** Rare earths are vital for surveillance, navigation, and missile systems.

Key Policy Measures by India:

1. **National Critical Mineral Mission (NCMM):**
   - Formed in 2024 under Ministry of Mines.
   - Mandate: Secure critical mineral supply chains through exploration, refining, and strategic reserves.
2. **Amendment to MMDR Act:**
   - Allowed auction of 30 identified minerals.
   - 5 auction rounds concluded; over 400 exploration projects planned.
3. **International Partnerships:**
   - **Mineral Security Partnership (MSP)** with U.S., Australia.
   - Bilateral MoUs with Argentina, Bolivia for lithium.
   - Engagement via Quad, G20, BRICS.

Challenges in India's Critical Mineral Ecosystem:

- **High Import Dependence:**
  - India imports 100% of lithium, cobalt, rare earths.
  - China controls 70–90% of midstream processing globally.
- **Underdeveloped Domestic Capacity:**
  - Only preliminary exploration underway.
  - Refining, separation, and value addition infrastructure lacking.
- **Weak Private Sector Participation:**
  - Auctions saw low interest due to technical and financial entry barriers.
- **ESG and Tribal Concerns:**
  - Most mineral blocks lie in ecologically or tribally sensitive areas.
  - Legal delays due to poor Environmental, Social, and Governance compliance.
- **Lack of Circular Economy Infrastructure:**
  - Battery and e-waste recycling is informal and fragmented.
  - No formal collection/dismantling infrastructure or incentives.

Strategic Way Forward:

- **Midstream Infrastructure Development:**
  - Create mineral processing zones with PLI-style incentives.
  - Encourage public–private partnerships in refining and conversion tech.
- **Strengthen Exploration and Auctions:**
  - Build GSI's survey capabilities.
  - De-risk projects for investors with geodata and viability gap funding.
- **Green and Inclusive Mining:**
  - Mandate ESG frameworks, third-party audits, and community benefit-sharing.
  - Ensure fast environmental clearances without compromising on standard.
- **Build Circularity:**
  - Invest in formal battery/electronics recycling infrastructure.
    - Provide tax breaks, subsidies for high-efficiency recovery systems.
- **Diversify Global Supply Chains:**
  - Pursue "friendshoring" with trusted nations.
  - Leverage diplomacy to ensure stable, long-term mineral trade pacts.

Conclusion:

Critical minerals are the backbone of future industrial, environmental, and strategic advancement. While India has taken **bold initial steps through NCMM,** its success depends on sustained policy reforms, global alignment, and ecosystem capacity-building. The roadmap ahead must embrace **self-reliance (Atmanirbharta)** while ensuring sustainability, community equity, and strategic foresight.

EMBRACING GENETIC INNOVATION FOR INDIA'S AGRICULTURAL FUTURE

Context:

India faces international pressure to open its agriculture market to genetically modified (GM) crops, even as domestic biotech innovation remains restricted.

- Only **Bt cotton** is officially approved, while other GM crops like **Bt brinjal** and **GM mustard** face regulatory bottlenecks.

About Embracing Genetic Innovation for India's Agricultural Future:

Current Status of Indian Agriculture:

- **Declining Cotton Productivity:** Cotton yield has dropped from **566 kg/ha (2013–14)** to **436 kg/ha (2023–24)**, lagging far behind China and Brazil.
- **Rising Import Dependency:** India, once a net exporter, has become a **net importer of cotton**, with imports touching **$0.4 billion** in 2024–25.
- **Biotech Saturation:** Only **Bt cotton** is officially cultivated, while **GM mustard, brinjal, soy, and corn** await approvals.
- **Widening Yield Gap:** India's average cotton yield is just **436 kg/ha**, while **China and Brazil** achieve over **1,800–1,900 kg/ha**.
- **Technology Disparity:** Though global GM acreage has crossed **200 million ha**, India lags due to **regulatory blockages** and political hesitancy.

Government Interventions in Agriculture:

- **Bt Cotton Launch (2002):** Bt cotton approval under Vajpayee government led to a 193% rise in output in a decade.
- **SPCO 2015:** The Cotton Seed Price Control Order capped trait fees, reducing biotech firms' incentives to invest.
- **Conditional GM Mustard Clearance (2022):** The GEAC gave a green light for environmental release, but commercialisation is stuck.
- **Jai Anusandhan Initiative:** Recent launch of a ₹1 lakh crore RDI fund aims to strengthen agriculture innovation ecosystems.
- **Technology Transfer Mandates (2016):** Government imposed rules for forced tech sharing and fee caps, discouraging private sector entry.

Key Challenges in Agricultural Development:

- **Regulatory Delays: Bt brinjal (moratorium since 2009)** and GM mustard face prolonged approval bottlenecks.
- **Illegal HT-Bt Cotton Use**: Despite a ban, **HT-Bt cotton is grown across 5 major states**, covering up to **25% of area**.
- **Rigid Policy Framework**: Regulatory controls like **trait fee caps** and license terms have deterred innovation.
- **Pest Infestation**: Cotton is increasingly attacked by **pink bollworms and whiteflies**, causing yield losses.
- **Farmer Vulnerability**: Farmers using **unregulated seeds** face higher crop failure risk without legal protection or redress.

Arguments Against GM Crops in India:

- **Ecological risks and biodiversity loss:** Introduction of GM crops like Bt brinjal or GM mustard may lead to **genetic contamination** of native varieties and reduce biodiversity.
- **Health uncertainties:** Long-term health effects of consuming GM foods remain **scientifically inconclusive**, leading to public distrust and court cases.
- **Undermining seed sovereignty:** GM crops often come with **intellectual property rights**, making farmers dependent on large corporations for seed purchase every season.

  E.g. Monsanto-Mahyco Bt cotton disputes highlight farmers' loss of seed autonomy.
- **Regulatory opacity and trust deficit:** Lack of transparency in GEAC approvals and **insufficient field trials** have triggered protests from scientists and farmer unions.

  E.g. Bt brinjal moratorium in 2009 followed mass opposition from states and civil society.
- **Risk of monopolies and economic vulnerability:** High-cost GM seeds may **exclude small and marginal farmers**, increasing inequality in access to technology.

Role of Innovation in Transforming Agriculture:

- **Bt Cotton Success Story:** Bt cotton increased productivity by **87%** and boosted income, especially in **Gujarat**.
- **Global GM Adoption:** Over **76 countries** now grow GM crops across **200+ million hectares**, raising yields and reducing input costs.
- **GM Mustard & Brinjal Potential:** These crops can **reduce pesticide use** and **enhance yields**, improving food security.
- **Innovation-Driven Growth:** Initiatives like **Jai Anusandhan** can transform agriculture only if backed by market-facing policies.
- **Biotech for Bharat:** Vajpayee's vision - "**What IT is for India, BT is for Bharat**"—emphasized biotech's role in **rural upliftment**.

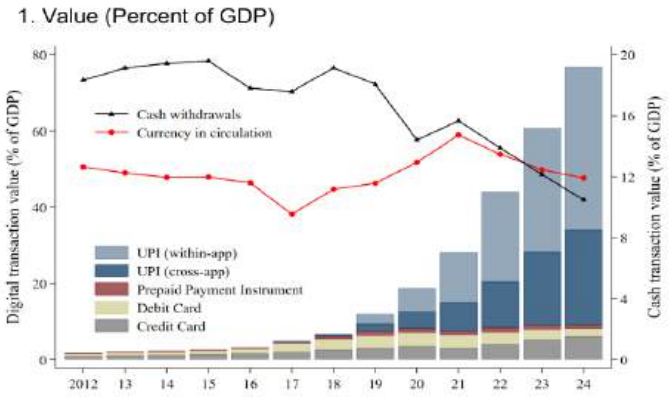
Conclusion:

India's agricultural future depends on **science-led innovation**, not protectionism. Bridging the gap between **regulation and on-ground demand** is key to revitalising productivity. Commercialising **tested GM crops will ensure food security, rural prosperity, and global competitiveness.**

INDIA BECOMES GLOBAL LEADER IN FAST PAYMENTS – IMF REPORT

Context:

India has become the global leader in real-time payments as UPI processed 18.39 billion transactions in June 2025, according to an IMF-supported report.



About India Becomes Global Leader In Fast Payments – IMF Report:

What the Report is?

- Jointly developed by the **International Monetary Fund (IMF)** and FIS Global, this Fast Payments Report 2025 analyses global public digital infrastructure.
- **It uses a new metric:** Faster Payment Adoption Score (FPAS) to benchmark digital payment adoption.

India's Achievements:

- **Top Global Rank (FPAS: 87.5%):** India leads 30 countries, surpassing Brazil, Singapore, UK, and USA.
- **UPI Scale:** Processes over **640 million transactions daily**, serving 491 million individuals and 65 million merchants via 675 banks.
- **Speed and Cost:** Delivers payments within **5 seconds**, with **near-zero cost per transaction**.
- **Global Reach:** UPI is now operational in **7 countries**, including France, UAE, and Singapore.
- **BRICS Integration:** India is advocating UPI as a cross-border payment standard among BRICS+ nations.

Key Features of India's UPI Ecosystem:

- **Interoperability:** Unified interface across banks and apps like PhonePe, GPay, Paytm.
- **Inclusiveness:** Aadhaar-linked, USSD-enabled, multilingual access—enabling rural digital payments.
- **Innovation Stack:** Built atop India Stack (Aadhaar, eKYC, DigiLocker, Account Aggregator).
- **Security Protocols:** Real-time fraud detection, tokenisation, and regulatory compliance.
- **Govt–Private Partnership:** NPCI + fintech startups + RBI = scalable, resilient digital infrastructure.

Limitations of UPI:

- **Low Offline Penetration:** UPI still requires internet connectivity for most users, limiting adoption in remote or low-bandwidth areas.
- **Interoperability Gaps Abroad:** Despite global expansion, UPI's cross-border utility is constrained due to lack of uniform regulatory standards and infrastructure in partner countries.
- **Data Privacy Concerns:** The report warns of inadequate user data protection laws, raising concerns about misuse or over-collection of personal financial data.
- **Fragmented Dispute Resolution:** Complaint redressal remains weak and unstandardized across UPI apps and banks, reducing user trust in case of failed or fraudulent transactions.
- **Overdependence on Mobile-First Access:** UPI is not fully accessible to senior citizens, non-digital natives, or those without smartphones, risking digital exclusion.

Way Ahead:

- **Build Robust Offline Capability:** Expand USSD and NFC-based UPI Lite+ to ensure reach in rural, low-connectivity zones.
- **Global Regulatory Alignment:** Collaborate with central banks to harmonize data security, authentication, and settlement systems for UPI's cross-border use.
- **Strengthen Legal Frameworks:** Introduce a comprehensive **Digital Payments Consumer Protection Act** to address data misuse and transaction failures.
- **Inclusive Design Principles:** Promote accessibility features (voice-assisted UPI, vernacular UIs) for elderly, disabled, and digitally illiterate populations.
- **Unified Grievance Redressal Platform:** Create a central, AI-assisted resolution portal for UPI complaints, integrated with NPCI and RBI systems.

Conclusion:

UPI's rise as a global digital payments model showcases India's innovation in public digital infrastructure. However, bridging accessibility, legal, and global compatibility gaps is crucial to sustaining this success. A future-ready, inclusive, and secure UPI can be a blueprint for the world's digital economies.

RELOOKING INTO INDIAN AVIATION SAFETY

Context:

The Air India crash in Ahmedabad (June 2025) has reignited concerns over aviation safety. A preliminary AAIB report remains inconclusive, highlighting deeper issues in India's aviation regulatory ecosystem.

About Relooking into Indian Aviation Safety:

What is the Aviation Sector?

The aviation sector includes airline operators, airport infrastructure, air traffic management, and regulatory authorities like DGCA and MoCA. It is a critical service infrastructure connecting geographies and enabling economic mobility.

India's Aviation Status & Safety Snapshot:

- **3rd largest domestic aviation market** globally (350+ million annual passengers).
- Daily traffic crossed **5 lakh passengers in 2024**.
- **Domestic traffic grew 5.9%**, international traffic by **11.4%** in 2024.
- **AAIB crash reports (e.g., Kozhikode 2020, Ahmedabad 2025)** expose systemic safety lapses.
- India has **13–18% women pilots**, among the highest globally.
- Only **80 airports operate on green energy**, while **infrastructure races ahead of regulatory checks**.

Importance Of The Aviation Sector:

- **Connectivity:** Connects remote and aspirational districts under UDAN.
- **Economic Growth:** Fuels tourism, trade, cargo, and services.
- **Employment:** Pilot demand to reach **34,000+** by 2040; FTOs expanding.
- **Strategic Role:** Supports national defense logistics and disaster response.
- **Global Integration:** Boosts India's image as a rising global aviation hub.

Challenges To Aviation Safety:

- **Regulatory Weakness:** DGCA lacks independent technical expertise and relies heavily on FAA/EASA for safety decisions. This undermines India's ability to take proactive, indigenous safety measures.
- **Airspace Encroachment:** Over 1,000 vertical obstacles violate IHS norms around Mumbai airport alone. Judicial PILs show how MoCA and DGCA bypassed earlier statutory restrictions.
- **Pilot & Crew Fatigue:** Airlines violate Flight Duty Time Limitations under DGCA-approved exemptions. Whistle-blowers face dismissal or demotion, silencing critical safety warnings.
- **Maintenance Gaps:** AMEs face overwork without regulated duty hours; technicians with lesser skills are used. This cost-cutting practice increases the likelihood of undetected mechanical failures.
- **ATC Shortages:** India faces an acute shortage of trained Air Traffic Control Officers across sectors. Duty-time limits and licensing reforms recommended post-Mangalore crash remain pending.
- **Infrastructural Overreach:** High-rise buildings approved around airports violate safety buffer zones.

Way Ahead:

- **Independent Safety Regulator:** Create an autonomous body to monitor aviation safety outside MoCA's administrative ambit. This will ensure unbiased investigations and stricter regulatory enforcement.
- **Stringent Obstacle Control:** Restore legal frameworks like the Aircraft Act and S.O. 988 for obstacle regulation. Enforce height restrictions around airports through statutory mechanisms.
- **Whistleblower Protection:** Establish institutional safeguards to protect whistle-blowers from retaliation. Encourage reporting of violations through anonymous and secure channels.
- **ATCO and AME Reforms:** Fix working hours for AMEs and ATCOs in line with global fatigue norms. Increase recruitment and licensing support to address long-term shortages.
- **Global Best Practices:** Fully implement ICAO and FAA safety protocols with Indian contextual customization. Strengthen audit, compliance, and public transparency in accident inquiries.

Conclusion:

Aviation safety is not a technical formality—it is a **non-negotiable public good. India must match its passenger volume growth with world-class safety culture. Reforms, accountability, and human lives can no longer be postponed—aviation safety must become a national priority.**

Topics: Awareness in space.

INDIA SUCCESSFULLY LAUNCHED THE NASA–ISRO SYNTHETIC APERTURE RADAR (NISAR) SATELLITE

Context:

India successfully launched the NASA–ISRO Synthetic Aperture Radar (NISAR) satellite aboard GSLV-F16 from Sriharikota on July 31, 2025.

- It marks the first joint Earth-observation mission between ISRO and NASA, symbolizing deep Indo-US space collaboration.

About India Successfully Launched The NASA–ISRO Synthetic Aperture Radar (NISAR) Satellite:

- **What is NISAR?**
  - **Full Form – NASA–ISRO Synthetic Aperture Radar:** Joint Earth observation satellite using dual-frequency SAR tech for land and ice monitoring.
  - **Mission Life – 5 years (2025–2030):** Designed to capture Earth data over five years with 12-day revisit cycles.
  - **Orbit – Sun-synchronous polar orbit (747 km):** Ensures consistent lighting for accurate change detection across the globe.
  - **Launch Site – Satish Dhawan Space Centre, Sriharikota:** Launched aboard GSLV-F16, marking ISRO's first polar orbit GSLV mission.
- **Objectives Of the Nisar Mission:**
  - Detect minute land and ice surface movements with centimetre-level precision.
  - Monitor natural disasters such as earthquakes, floods, landslides, and volcanic activity.
  - Track changes in forests, glaciers, wetlands, and soil moisture.
  - Support agriculture, infrastructure, coastal, and climate management through actionable data.
- **Key Features of the Nisar Mission:**
  - **Dual-Frequency SAR:** First satellite to use both L-band (NASA) and S-band (ISRO) radars.
  - **Wide Swath & High Resolution:** Scans 242 km swath with detailed spatial mapping every 12 days.
  - **All-Weather, 24/7 Imaging:** Operates day-night, even through cloud cover and storm conditions.
  - **12-metre Deployable Reflector Antenna:** Enables advanced SweepSAR technology for surface deformation detection.
- **Contributions: INDIA vs. USA**
  - **NASA:** L-band radar, deployable boom, reflector antenna, GPS, solid-state recorder, and telecom system.
  - **ISRO:** S-band radar, satellite bus (I-3K), GSLV-F16 launcher, solar arrays, data handling, and ground control.
  - **Mission Management:** Jointly executed via NASA's JPL and ISRO's multiple centers (SAC, URSC, VSSC, NRSC).
- **Significance Of Nisar Mission:**
  - **Scientific Edge:** Enables global-scale, real-time Earth system monitoring and disaster forecasting.
  - **Strategic Diplomacy:** Strengthens Indo-US civil space cooperation under "science diplomacy."
  - **Climate Action & SDGs:** Assists in global efforts towards climate adaptation, sustainable agriculture, and resource governance.
  - **Knowledge Export:** Open data policy supports developing nations and global researchers in Earth sciences.
- **Conclusion:**

  NISAR is a landmark in Indo-US space partnership, blending high-end technology with societal impact. It transitions India from utility-driven to knowledge-led space applications. Through NISAR, India affirms its leadership in Earth observation, sustainability, and global science cooperation.

Topics: Awareness in the fields of IT, Computers, robotics, nano-technology, bio-technology and issues relating to intellectual property rights.

GI TAG ISSUE - KOLHAPURI CHAPPAL

Context:

Luxury brand Prada showcased Kolhapuri chappal-inspired footwear in Milan (June 2025), triggering a debate on cultural misappropriation of India's GI-tagged heritage products.

अतुल्य भारत की अमूल्य निधि
Invaluable Treasures of Incredible India

About GI Tag Issue - Kolhapuri chappal:

What is a GI Tag?

- A Geographical Indication (GI) is a form of intellectual property right used to identify products that originate from a specific location and have unique qualities, reputation, or characteristics tied to that place.

Established Under:

- The **Geographical Indications of Goods (Registration and Protection) Act, 1999**, which came into force in **2003** following India's TRIPS obligations.

Objective:

- To **legally protect regional goods**, prevent unauthorised usage, support **rural artisans and farmers**, and enhance the **global visibility of traditional products**.

Key Features:

- **Public Property:** GI belongs to producer groups or communities, not individuals or firms.
- **Non-Transferable:** Cannot be sold or licensed like trademarks.
- **10-Year Protection (Renewable)**: GI tags are valid for 10 years and can be renewed indefinitely.
- **Cultural Linkage:** Protects traditional skills, knowledge, and identity of regions.
- **Legal Enforcement:** Prohibits unauthorised use and provides penalties for infringement.

Recent Issue: Kolhapuri Chappals Misused by Prada

- Prada's **Spring/Summer 2026 collection** showcased footwear closely resembling GI-tagged Kolhapuri chappals.
- Despite the GI tag in India, **no automatic international GI protection** exists, highlighting the **territorial limitations** of GI laws.

Shortcomings of the GI Regime:

- **No Global GI Protection**: GI rights are **territorial**, and there is **no universal GI law** to prevent misuse abroad.
- **Weak Enforcement:** Cross-border infringements like Prada or Basmati cases show limited legal recourse internationally.
- **Lack of Awareness:** Many producer communities remain **unaware or under-supported** to enforce their rights.
- **Database Gaps:** No **centralised global searchable GI database**, making brand due diligence difficult.
- **Slow Recognition Process:** Registration and recognition of GIs in other jurisdictions is often costly and time-consuming.

Historical Examples of Misappropriation

- **Basmati Patent Case (1997):** US firm Ricetec tried to patent rice lines; India successfully contested it.
- **Turmeric Patent (1995):** Revoked after CSIR proved prior traditional use.
- **Neem Case (2000):** European patent on neem-based antifungal use cancelled due to prior knowledge in Ayurveda

Significance of GI Tags:

- **Cultural Preservation:** Safeguards traditional craftsmanship and community knowledge systems.
- **Economic Upliftment:** Enhances rural income by allowing local producers to command premium prices.
- **Consumer Confidence:** Offers **authenticity assurance** and deters counterfeit markets.
- **Boosts Exports & Tourism:** Darjeeling Tea, Pashmina, and Mysore Silk are **globally recognised brands** thanks to GI status.
- **Supports Self-Reliance:** Aligns with *Aatmanirbhar Bharat* by empowering local production ecosystems.

Conclusion:

GI tags are vital in preserving cultural heritage, promoting indigenous economies, and ensuring global brand identity. However, international enforcement gaps limit their effectiveness against cultural misappropriation. A multilateral GI framework, community awareness, and global recognition are essential to safeguard India's traditional legacy.

PYQ:

1. In a globalized world, Intellectual Property Rights assume significance and are a source of litigation. Broadly distinguish between the terms—Copyrights, Patents and Trade Secrets. (UPSC - 2014)

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

ALL INDIA TIGER ESTIMATION

Context:

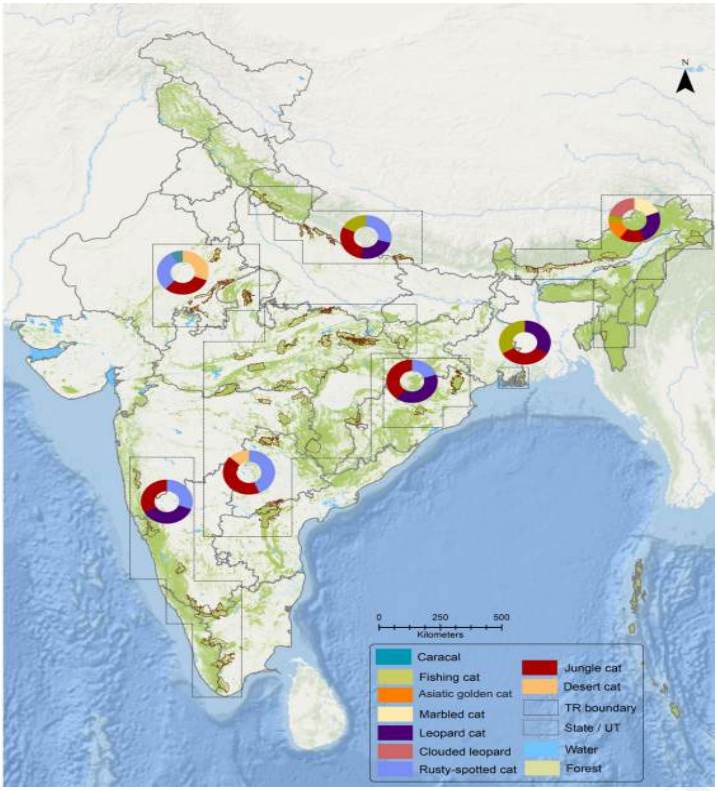
On Global Tiger Day 2025, the Ministry of Environment, Forest and Climate Change released the report "Status of Small Cats in Tiger Landscapes of India", highlighting findings from the 2018 & 2022 All India Tiger Estimation (AITE) to track 9 small cat species across tiger habitats.

About Status of Small Cats in Tiger Landscapes of India:

What It Is?

A first-of-its-kind scientific report assessing the occupancy, habitat distribution, and ecological status of nine small wild cat species across India's tiger-range

landscapes, based on data from the All-India Tiger Estimation (2018 & 2022).



Released By: Released on **29th July 2025 (Global Tiger Day)**.

Objectives of the Report:

1. **To map distribution and occupancy** of nine small cat species across various habitats in India's tiger landscapes.
2. **To identify habitat preferences** and how human disturbances impact their presence.
3. **To assess conservation dependence** of lesser-known felids on protected areas like tiger reserves.
4. **To provide baseline data** for integrating small cats into long-term wildlife monitoring and landscape planning.
5. **To inform policy formulation and research** for conserving small carnivores beyond charismatic megafauna.

Species Covered & Key Findings

Species	Estimated Occupancy (km²)	Habitat Type	Key Notes
Jungle Cat	96,275	Dry to moist deciduous forests, widespread	Most common and resilient to disturbance
Rusty-Spotted Cat	70,075	Mixed deciduous forests	Second most widespread; prefers interior forests
Leopard Cat	32,800	Moist forests (NE, Western Ghats, Sunderbans)	Found mainly in Himalayan foothills, North East & wetlands
Desert Cat	12,500	Semi-arid and dry forests (W & C India)	Specialist, restricted range
Fishing Cat	7,575	Wetlands, riverine, mangroves (Terai, NE)	Habitat-specific, impacted by wetland loss
Clouded Leopard	3,250	Dense forests (NE India)	Rare, elusive, canopy-dwelling
Marbled Cat	2,325	Dense forests (NE India)	Very low detection, elusive
Asiatic Golden Cat	1,850	Evergreen forests (NE India)	Restricted and highly elusive
Caracal (no detection)	N/A	Historically in NW and Central India	Not recorded in the survey period, raises concern

Ecological Insights:

1. **Habitat Generalists Thrive:** Jungle and rusty-spotted cats show wide distribution across diverse forest types, even near human-modified areas.
2. **Wetland & Forest Dependence:** Fishing cats, leopard cats, and clouded leopards are tightly linked to specific habitats like wetlands and dense forests.
3. **Altitude and Forest Density:** Rare species like marbled and golden cats occupy only intact, high-canopy forests in

Northeast India.

4. **Human Pressure Gradient:** Occupancy sharply declines with increased human activity, except for adaptive species like jungle cats.
5. **Landscape-Level Continuity:** Small cats rely on both core tiger habitats and buffer zones, indicating need for broader landscape planning.

Conservation Significance:

1. **Baseline Mapping for 9 Species**: First-ever pan-India assessment of small cats, offering essential data for targeted conservation.
2. **Protected Areas as Refuges:** All species showed higher presence inside protected areas, validating Project Tiger's biodiversity umbrella effect.
3. **Indicator of Ecosystem Health:** Presence or absence of small cats reflects habitat integrity, prey base, and ecological stability.
4. **Need for Inclusive Monitoring:** Emphasizes shifting focus from flagship species (like tigers) to lesser-known but ecologically vital carnivores.
5. **Regional Conservation Priorities:** Northeast India, Terai wetlands, and dry forests of Central India need region-specific action plans.

Policy Implications:

1. **Integrate Small Felids in Planning:** Landscape-level wildlife policies must include small cats in reserve, buffer, and corridor strategies.
2. **Expand Monitoring Beyond Tigers**: Regular small carnivore tracking should be institutionalized within All-India Tiger Monitoring exercises.
3. **Prioritise Wetland and Mangrove Protection:** Protect critical fishing cat habitats via enhanced eco-sensitive zone (ESZ) regulations.
4. **Habitat-Specific Policy Measures**: Customised conservation for habitat specialists like desert cat and marbled cat is urgently needed.
5. **Public Awareness and Curriculum Inclusion:** Include small cats in wildlife education, eco-club programs, and public awareness campaigns.

Conclusion:

This pioneering report brings long-overdue attention to India's small wild cats, underlining the value of tiger landscapes as biodiversity umbrellas. It sets a foundation for inclusive conservation strategies that go beyond flagship species and emphasizes the need for fine-scale ecological research and habitat preservation for lesser-known fauna.

DRAFT NATIONAL TELECOM POLICY (NTP) 2025

Context:

The Ministry of Communications released the Draft National Telecom Policy (NTP) 2025, proposing incentives for using Indian-made telecom equipment.

About Draft National Telecom Policy (NTP) 2025:

What is Draft NTP 2025?

A forward-looking national policy framework by the **Department of Telecommunications (DoT)** that outlines India's telecom priorities from **2025 to 2030**, focusing on **Atmanirbhar Bharat**, universal access, and future technologies like **6G and quantum communication**.

Key Features of Draft NTP 2025:

1. **Domestic Equipment Push**
   - Proposes **incentives for operators** using **locally made telecom gear** to support Indian firms like Tejas Networks and HFCL.
   - Aims to **substitute 50% of telecom imports** through homegrown manufacturing.
2. **R&D and IP Innovation:**
   - Plans to **double India's telecom R&D expenditure**, support **500 tech startups**, and capture **10% of global 6G-related IPRs**.
   - Emphasizes **blended finance, fund-of-fund models** to promote innovation.
3. **Infrastructure & Universal Connectivity:**
   - Targets **100% 4G coverage** and **90% 5G coverage** by 2030.
   - Increase **tower fiberization from 46% to 80%** and fully connect all **gram panchayats via BharatNet** with 98% uptime.
   - Expand fixed-line broadband to **100 million households** and deploy **1 million public Wi-Fi hotspots**.
4. **Employment and Skill Development:**
   - Plans to create **1 million new jobs** and upskill **1 million workers** in emerging telecom areas.
5. **Export and Investment Targets:**
   - Double exports of telecom products and services.
   - Achieve **₹1 trillion annual investments** in

the telecom sector.

6. **Secure and Trusted Networks:**
   - Proposes equipment audits to weed out **non-trusted telecom hardware**, with a focus on national security via **quantum-secure systems**.
7. **Green Telecom Goals:**
   - Set to **cut the sector's carbon footprint by 30%**, emphasizing **sustainable deployment and clean energy integration**.

Significance of the Policy:

1. **Atmanirbhar Telecom Boost:** Revives focus on **Make-in-India** in telecom equipment, reducing reliance on Chinese imports.
2. **Bridging Digital Divide:** Addresses **rural-urban digital gap** via aggressive fiberization and public Wi-Fi expansion.
3. **Revamping PLI Shortcomings:** Acknowledges past lapses in **PLI disbursements** and attempts corrective action through demand generation and clearer policy alignment.
4. **Global Tech Race Readiness:** Positions India for **6G leadership**, leveraging startups and IP development.
5. **Holistic Sectoral Reform:** Envisions synergy across **connectivity, innovation, investment, and national security**.

Conclusion:

The Draft NTP 2025 marks a strategic shift toward self-reliance, innovation, and secure telecom infrastructure. By addressing past policy gaps and setting bold targets, it aims to transform India into a global telecom hub. Its success, however, hinges on timely execution and ecosystem alignment.

THE VANUATU CASE IN ICJ

Context:

In a historic advisory opinion, the International Court of Justice (ICJ) ruled that access to a clean, healthy, and sustainable environment is a fundamental human right. The case was initiated by Vanuatu and supported by over 130 nations vulnerable to climate change.

About *The Vanuatu Case In ICJ*:

What Was the Issue?

- In 2023, the **UN General Assembly** requested the ICJ's opinion on **state obligations under international law** to tackle climate change and the **legal consequences for inaction**.
- The case was led by **Vanuatu**, representing **small island developing states (SIDS)** facing existential threats from **rising sea levels and warming oceans**.

Key Questions Posed:

- What are the **legal duties of states** under international law to prevent climate harm?
- What are the **legal consequences** for states that cause significant climate-related damage?

Key Takeaways from the ICJ Advisory Opinion (2025)

1. **Clean Environment as a Human Right:**
   - The ICJ held that a **clean, healthy, and sustainable environment** is **inherent to the enjoyment of other human rights** (Para 1, ICJ Ruling).
   - This right is rooted in **international human rights law and customary international law**.
2. **Binding Obligations under Treaties:**
   - **UNFCCC, Kyoto Protocol, and Paris Agreement** impose **binding obligations** on signatory states:
     - i. Adopt mitigation and adaptation measures.
     - ii. Prepare and implement Nationally Determined Contributions (NDCs).
     - iii. Cooperate through technology transfer and climate finance.
3. **Due Diligence and State Responsibility:**
   - States must **prevent significant transboundary environmental harm** with **due diligence**, including regulating private actors (fossil fuel producers).
   - States are liable for **breaches of treaty or customary norms**, and may owe **restitution or compensation**.
4. **Legal Consequences of Inaction:**
   - Failure to act constitutes an **internationally wrongful act**, triggering:
     - i. **Cessation and guarantees of non-repetition**,
     - ii. **Compensation and restitution** to affected states or peoples.
5. **Historical Emissions and Accountability:**
   - ICJ acknowledged that **cumulative historical emissions** can be traced to particular states, opening doors for **legal attribution and reparation claims**.
6. **Climate Obligations as Erga Omnes:**
   - States' obligations to protect the climate

are **erga omnes**—owed to the entire international community.
    - All states have a **legal interest in enforcement**, regardless of direct injury.
7. **Scientific Attribution Admissible:**
    - ICJ accepted **climate science** as valid evidence in legal proceedings.
    - Courts may consider **scientific data** to establish causal links between emissions and harm.

Key Rights and Legal Principles Cited by ICJ

1. **Right to Life and Dignity**
    - Derived from **Article 6** of the **International Covenant on Civil and Political Rights (ICCPR)**
    - Climate harm was seen as infringing on the basic right to life.
2. **Right to Health**
    - Based on **Article 12** of the **International Covenant on Economic, Social and Cultural Rights (ICESCR)**
    - Pollution and degradation directly affect physical and mental health.
3. **Right to Development**
    - Mentioned in the **UN Declaration on the Right to Development (1986)**
    - ICJ emphasized that environmental destruction hinders sustainable development.
4. **Right to a Clean, Healthy, and Sustainable Environment**
    - Recognized in **UN General Assembly Resolution 76/300 (2022)**
    - The ICJ reiterated that this right is **"interlinked with and essential for the enjoyment of all human rights."**
5. **Principle of Intergenerational Equity**
    - Noted as a guiding principle of international environmental law.
    - The Court stressed the **duty to protect the environment for future generations.**
6. **Polluter Pays Principle & Common but Differentiated Responsibilities (CBDR)**
    - Drawn from the **Rio Declaration on Environment and Development (1992)**
    - Used to justify historical accountability and differentiated obligations.
7. **Obligations Erga Omnes (Universal Obligations):**
    - The Court noted that **climate protection falls under obligations erga omnes**—duties all States owe to the international community as a whole.

Implications for India and Global Climate Law:

- **Legal precedent** for future domestic and international climate litigation.
- Empowers **developing nations and SIDS** in UNFCCC negotiations.
- Reinforces India's constitutional commitment under **Article 21** and **Article 48A** for environmental protection.
- Can strengthen judicial actions like **Delhi air pollution cases**, **waste management PILs**, and **climate adaptation suits** in NGT and Supreme Court.

TRACKING INDIA'S CLIMATE GOALS

Context: India has announced that non-fossil fuel sources now constitute over 50% of its installed electricity capacity, fulfilling a core 2030 Paris Agreement target five years ahead of schedule.

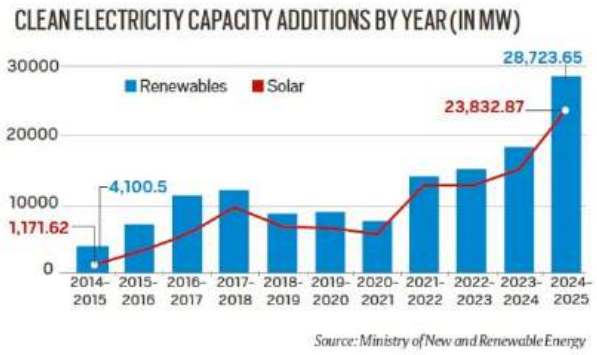
- Meanwhile, significant progress is also seen in emission intensity reduction and carbon sink expansion.

About Tracking India's Climate Goals:

India's Paris Climate Commitments (Updated NDCs):

India's three key climate targets for 2030 under the **Paris Agreement**:

1. **Installed electricity capacity:** At least **50% from non-fossil fuel sources**.
2. **Emission intensity:** Reduce by **45% from 2005 levels**.
3. **Carbon sink:** Create an **additional 2.5 to 3 billion tonnes** CO_2 equivalent through forest/tree cover.



Achievements So Far:

1. **Installed Non-Fossil Fuel Capacity**
    - India has reached **484.82 GW**, of which **242.78 GW** is from **non-fossil sources** (hydro, nuclear, solar, wind).
    - **Achieved the 50% target by 2025**, five years early.
    - In 2024 alone, India added **30 GW renewable**, including **24 GW of solar**.
2. **Carbon Sink Target:**
    - India added **2.29 billion tonnes** of carbon sink by 2021.
    - ISFR data shows an **annual increase of ~150 million tonnes**.
    - If trends continue, **total sink crosses 2.5**

billion tonnes by 2023, meeting the target.

3. **Emissions Intensity:**
    - As of 2020, India had reduced **emissions intensity by 36%**.
    - Even without updated data, progress indicates that **45% reduction by 2030 is achievable**.

Reality Check:

Indicator	Data
Electricity in total energy use	**<22%**
Share of non-fossil in electricity generation (not capacity)	**28%**
Overall clean energy in total energy consumption	**≈6%** (electricity share × clean share of electricity)

Most energy consumption in India is still through **direct fossil fuel use** (coal, oil, gas).

- So, while electricity is greening fast, **industry, transport, and cooking** still rely heavily on polluting fuels.

Significance of India's Progress:

- Early achievement of targets enhances India's credibility at COP and UNFCCC platforms.
- Demonstrates that a developing country can lead in clean energy transitions.
- India is proving that climate goals can be aligned with development imperatives, despite lacking climate finance from developed countries.

Challenges Ahead:

- **China's Pace**: China is expanding renewable capacity at nearly ten times India's rate, widening the global green energy leadership gap.
- **Electricity Intermittency:** Solar and wind generation depend on weather and time, unlike coal/nuclear which provide consistent base-load.
- **Slow Uptake in Non-Power Sectors:** Sectors like transport, industry, and buildings still heavily rely on direct fossil fuel use.
- **SMRs Unlikely by 2030:** India's Small Modular Reactor program is still in R&D stage and not deployment-ready.

Way Forward:

- **Scale Clean Technologies Beyond Power:** Decarbonizing transport, industry, and cooking with EVs, green hydrogen, and clean biomass is critical.
- **Accelerate Nuclear and Hydro:** Stable power from nuclear and hydro ensures round-the-clock electricity alongside intermittent solar and wind.
- **Push for Global Climate Finance**: India needs concessional finance and tech transfers promised under the Paris Agreement.
- **Domestic Carbon Market**: A regulated carbon credit system can incentivize industries to cut emissions voluntarily.

Conclusion:

India's achievement of its climate goals — especially five years in advance — signals a transformative moment in global climate leadership. But the real challenge lies beyond power generation: in shifting the entire energy economy, ensuring just transitions, and holding developed countries accountable for support. The next phase will require fiscal innovation**, deep sectoral reforms**, and **resilient governance** to sustain the pace.

GLOBAL WETLAND OUTLOOK 2025

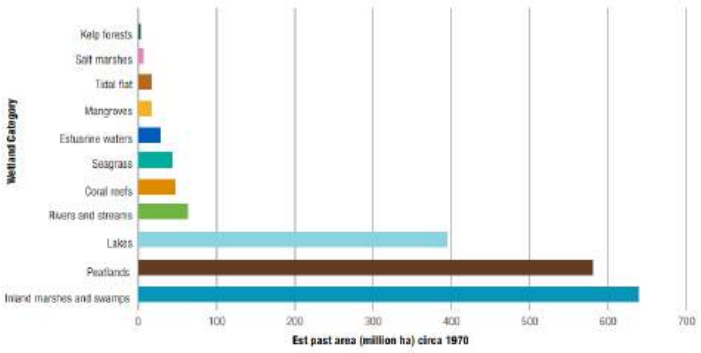
Source: GWO

Context: The Global Wetland Outlook 2025, released by the Ramsar Convention, warns of accelerating wetland degradation worldwide, with over 35% lost since 1970, threatening biodiversity and climate resilience.

About Global Wetland Outlook 2025:

What Are Wetlands?

- **Definition:** Wetlands are ecosystems where land is covered by water (permanently or seasonally), supporting unique biodiversity.
- **Types:** Include marshes, swamps, bogs, peatlands, mangroves, and estuaries.
- **Characteristics:**
    - High water saturation
    - Unique soil types like hydric soils
    - Vegetation like reeds, grasses, or mangroves
    - Transition zones between terrestrial and aquatic systems



Key Data from Global Wetland Outlook 2025:

- **Loss Rate:** Wetlands are vanishing **3x faster than forests**; over **35% lost since 1970**.
- **Biodiversity Decline:** Populations of wetland species fell by **over 80%** between 1970–2022.
- **Carbon Sink:** Peatlands cover **just 3%** of Earth's surface but store **30% of global soil carbon**.
- **Agricultural Stress:** Nearly **50% of wetlands**

degraded due to agriculture and water extraction.

- **India Insight:** India has **19 Ramsar sites facing ecological stress**, notably Keoladeo National Park and Chilika Lake.

Analysis – Opportunities & Concerns:

Positives:

1. **Biodiversity Hotspots:** Wetlands like Loktak Lake and Sundarbans are lifelines for migratory birds, fish, and endangered species.
2. **Flood Regulation:** Acts as natural sponges, reducing flood impact during heavy monsoons (e.g., Kolleru in Andhra Pradesh).
3. **Carbon Sequestration:** Peatlands are efficient carbon sinks, supporting India's net-zero targets.
4. **Livelihood Source:** Supports 1 billion people globally—through fishing, agriculture, and tourism.

Challenges:

1. **Policy Fragmentation:** Wetlands fall under multiple ministries, leading to poor coordination.
2. **Illegal Encroachments:** Urban wetlands like Bengaluru's Bellandur Lake face degradation due to encroachments and pollution.
3. **Data Deficiency:** Lack of updated national wetland inventory; last comprehensive mapping done a decade ago.
4. **Climate Risk:** Rising temperatures and erratic rainfall patterns worsen wetland drying and salinisation.
5. **Overuse of Water Resources:** Wetlands in Ganga plains face decline due to groundwater overextraction.

Recommendations:

1. **Unified Wetland Authority:** Establish a centralised agency under MoEFCC for wetland governance.
2. **Revise Wetland Rules 2017:** Include smaller urban and seasonal wetlands under legal protection.
3. **Incentivise Conservation:** Use carbon credit mechanisms to reward local communities.
4. **Improve Mapping & Monitoring:** Use AI-based remote sensing and satellite imagery for real-time wetland status.
5. **Mainstream into Climate Plans:** Integrate wetlands in state climate action plans (e.g., Kerala's Blue Carbon pilot).
6. **Community-Based Models:** Adopt Wetland Mitras or eco-clubs in schools for monitoring and awareness

Conclusion:

Wetlands are not wastelands but ecological powerhouses critical to climate resilience, biodiversity, and livelihood security. Protecting them is essential for achieving SDG-13, SDG-15, and India's net-zero 2070 vision.

MODEL RULES FOR FELLING TREES IN AGRICULTURAL LANDS

Context:

The Ministry of Environment, Forest, and Climate Change (MoEFCC) released Model Rules for Felling Trees in Agricultural Lands (2025) to simplify regulations and boost agroforestry, encouraging farmers to grow trees without legal hurdles.

About Model Rules for Felling Trees in Agricultural Lands:

What are the Model Rules for Felling Trees in Agricultural Lands?

These rules provide a **streamlined framework for registering plantations**, felling trees, and transporting timber from **non-forest agricultural lands**, aligning with the National Agroforestry Policy 2014 and India's climate and SDG commitments.

Key Features of the Model Rules:

1. **NTMS Portal Integration**: Mandatory registration of tree plantations and harvest requests through the National Timber Management System ensures digital traceability and ease of access.
2. **Simplified Tree Felling Process:**
   - For <10 trees: Photo uploads and auto NOC issuance.
   - For >10 trees: Online application, field verification, and felling permit generation.
3. **State-Level Committee (SLC):** A multidisciplinary committee ensures promotion, regulation, and monitoring of agroforestry and timber transport norms.
4. **Third-Party Verification System:** Empanelled agencies with forestry expertise assess plantations and certify eligibility for felling and transit.
5. **Farmer-Centric Record-Keeping**: Regular plantation data updates including species count, height, and geotagged photos required to maintain transparency.
6. **Technology-Enabled Monitoring:** GPS coordinates, Google Earth imaging, and geospatial tools used to verify tree growth and timber projections.
7. **Link to Wood-Based Industries**: Encourages market connectivity for agroforestry products, ensuring profitability for farmers.
8. **Focus on Climate and Soil Resilience:** Promotes water conservation, biodiversity, and carbon sequestration, reducing pressure on natural forests.

Issues Surrounding the Rules:

- **Portal Development Lag:** The NTMS portal is still under development, potentially delaying implementation.
- **Digital Literacy Barriers:** Farmers with low technical knowledge may find online processes complex.

- **Inconsistent State Adoption:** Being model rules, states may vary in adoption pace and structure, limiting national uniformity.
- **Risk of Exploitation:** Without strict oversight, powerful timber lobbies may misuse loopholes for unsustainable logging.

Significance of the Model Rules:

- **Boost to Domestic Timber Supply**: Helps bridge India's growing timber demand-supply gap (India imports ~$2B worth of wood annually).
- **Incentivizes Tree Cultivation**: Provides business viability for farmers to integrate high-value trees like sandalwood, teak, poplar, etc.
- **Climate Action Support**: Enhances India's carbon sink and contributes to Paris Agreement targets.
- **Empowers Rural Economy**: Creates employment and income streams in tree-based farming sectors, supporting Viksit Bharat 2047 goals.
- **Promotes Sustainable Agriculture**: Encourages diversified, resilient cropping systems integrating forestry and agriculture.

Conclusion:

The Model Rules mark a strategic step toward green growth by enabling regulatory ease for agroforestry. However, effective implementation, capacity building, and digital outreach are vital for it to succeed in both ecological and economic terms.

BONN CLIMATE TALKS 2025

Context:

The Bonn Climate Talks 2025, a crucial preparatory summit for COP30 in Brazil, ended with limited progress amid disagreements over finance, equity, and adaptation metrics.

About Bonn Climate Talks 2025:

- **What it is?**
  - A mid-year **UNFCCC Subsidiary Bodies meeting** that lays the technical groundwork for the annual COP summit.
- **Held in:** Bonn, Germany, June 2025
- **Organised by**: United Nations Framework Convention on Climate Change (UNFCCC)
- **Objective**:
  To assess climate action progress, **refine policy tools**, and build consensus on key agendas like finance, mitigation, adaptation, and loss and damage before COP30.

Key Outcomes of the Summit:

1. **Global Goal on Adaptation (GGA):**
   - 490 out of 9,000 indicators shortlisted to track adaptation progress in health, water, agriculture.
   - India backed **context-specific indicators** over uniform benchmarks.
2. **Mitigation Work Programme (MWP):**
   - Consensus on keeping the MWP as a **non-punitive, facilitative platform**.
   - Brazil proposed a digital knowledge-sharing hub and EU cautioned against duplication.
3. **Loss and Damage (L&D):**
   - Progress on integrating L&D into **Nationally Determined Contributions (NDCs)**.
   - Funding gaps and Santiago Network implementation remain unresolved.
4. **Climate Finance Roadmap ('Baku to Belém'):**
   - Talks initiated for a **$1.3 trillion/year climate finance target**.
   - Sharp divide over **grants vs loans** and **mitigation vs adaptation priorities**.
5. **Just Transition & Gender Action Plan:**
   - Countries stressed **equity-based transitions** and **labour rights**.
   - Disputes arose over terminology and scope of the new **gender framework**.

Failures of Bonn Climate Talks 2025:

1. **Procedural Delays:** Talks began 2 days late due to a deadlock over **agenda adoption**, especially on finance and carbon border taxes.
2. **No Consensus on Finance Metrics:** Developed countries resisted including **finance indicators** under adaptation goals, weakening accountability.
3. **Equity Deadlock:** LMDCs (incl. India) demanded historical responsibility; developed nations pushed **forward-looking, voluntary models**.
4. **Transparency Issues:** Discrepancies found in **ex-ante climate finance reporting** by developed countries under Article 9.5 of the Paris Agreement.

Way Forward:

1. **Strengthen Finance Architecture:** Shift focus to **predictable, non-debt instruments** (grants over loans); target small island and LDC-specific funds.
2. **Address Asymmetries in Commitments:** Ensure **burden-sharing frameworks** reflecting Common But Differentiated Responsibilities (CBDR) are built into COP30 outcomes.
3. **Streamline Adaptation Reporting:** Adopt **flexible, context-based indicators** and fund capacity-building to ease reporting burdens on developing nations.
4. **Institutional Reforms:** Empower **technical**

bodies with clear mandates; limit political micromanagement of scientific assessments.

Conclusion:

The **Bonn 2025 talks fell short** of building consensus on finance, equity, and adaptation. With **COP30 in Belém** approaching, stronger political will and climate justice framing are needed. Science has spoken—**politics must now catch up**.

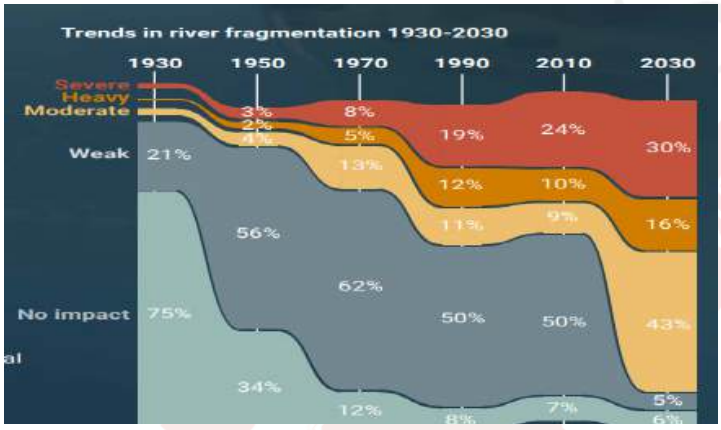
PYQ:

1. Describe the major outcomes of the 26th session of the Conference of the Parses (COP) to the United Nations Framework Convention on Climate Change (UNFCCC)? What are the commitments made by India in this conference? (2021)

UNEP FRONTIERS REPORT 2025

Context:

The United Nations Environment Programme (UNEP) released its 2025 edition of the Frontiers Report titled **"The Weight of Time"**, warning that intensified river and coastal flooding could remobilise long-buried **legacy toxic chemicals** from sediments, threatening ecosystems and human health.



About UNEP Frontiers Report 2025:

1. **Legacy Pollutants in Sediments:** Floodwaters can stir up **toxic legacy chemicals** like heavy metals (cadmium, lead) and persistent organic pollutants (POPs), previously buried in river and coastal sediments.
2. **Carcinogenic and Endocrine Disrupting Risks:** Cadmium levels in rivers like **Ganga, Hindon, and Vaigai** exceed safe limits, increasing risks of cancer, kidney damage, and pregnancy complications.
3. **Global Case Studies of Toxic Mobilization:** Hurricane Harvey (2017) spread **mercury and carcinogens** in Texas' Galveston Bay; the **Niger Delta floods (2012)** remobilized **polycyclic aromatic hydrocarbons** (PAHs).
4. **Pakistan's Storage Disaster:** The **2010 floods** swept away a large share of **2,835 MT of obsolete pesticides**, risking long-term contamination.
5. **Current Chemical Sources Still Active:** Landfills globally store **4.8–7 million tonnes of POP waste**, from organochlorine and organofluorine production.
6. **Climate Change Intensifies the Threat:** Increasing rainfall and **tropical cyclones** intensify flood frequency and scale, aggravating the **release of toxic sediments**.
7. **Bioaccumulation in Food Chain:** Sediment-bound pollutants can enter the **aquatic food chain**, affecting fish, plants, and ultimately humans.
8. **Long-Term Persistence:** Despite bans on many toxic chemicals, they persist for **decades**, making their delayed re-emergence especially dangerous.
9. **Need for Adaptive Flood Management:** The report stresses a **river-basin-level adaptive approach**, integrating **hydrology, ecology, and community knowledge**.

Key Challenges Highlighted:

- **Sediment Remobilization**: Toxic substances once safely buried are now being re-exposed due to flooding.
- **Lack of Monitoring:** Most river basins **lack real-time monitoring** of sediment pollution or chemical storage.
- **Infrastructure Gaps:** Poorly maintained **waste storage sites** and aging infrastructure worsen contamination risks.
- **Unmanaged Urbanization:** Encroachment and **land-use changes** around rivers increase flood vulnerabilities.
- **Chemical Persistence:** Legacy pollutants like **POPs and heavy metals** are highly resistant to degradation.

Recommendations and UNEP's Call to Action:

- **Nature-Based Solutions:** Prioritize **floodplains, wetlands**, and riparian buffers to absorb and slow down floods naturally.
- **Strengthen Infrastructure:** Use traditional methods like **polders, dikes, and retention basins** to control sediment movement.
- **Integrated River Basin Management:** Develop comprehensive **basin-level plans** that address floods, conservation, and water use together.
- **Sediment Pollution Mapping:** Invest in detailed **geo-mapping and profiling** of riverbed chemicals to plan interventions in advance.
- **Monitor Pollutant Pathways:** Track **how pollutants travel** post-flood — via water, soil, or food chain — and apply mitigation techniques.
- **Update Waste Disposal Practices:** Safely dispose of **obsolete pesticides and toxic industrial by-products** before disasters occur.

Conclusion:

The **UNEP Frontiers 2025 report** is a stark reminder that climate change and pollution risks are no longer isolated. Flooding not only displaces people but also awakens buried toxic legacies, threatening ecosystems and health. India and the world must adopt holistic, science-based, and inclusive river basin management frameworks to mitigate cascading risks.

CENTRE'S EXEMPTION POLICY FOR THERMAL PLANTS

Context:

The Union Environment Ministry has exempted 78% of India's thermal power plant units from installing Flue Gas Desulphurisation (FGD) systems meant to reduce SO_2 emissions.

About Centre's Exemption Policy for Thermal Plants:

What is It?

- The Ministry of Environment, Forest and Climate Change (MoEFCC) issued new norms based on a scientific advisory panel led by the Principal Scientific Adviser.
- The new framework classifies power plants into three categories based on location and pollution levels.

What are the Exemptions?

1. **Category A (11%)**:
    - Located within 10 km of **NCR or cities with >1 million population**.
    - Must install FGDs by **December 30, 2027**.
2. **Category B (11%)**:
    - Located near **critically polluted areas (CPA)** or **non-attainment cities (NAC)**.
    - FGD installation subject to **expert review**; deadline: **December 2028**.
3. **Category C (78%)**:
    - Located outside high-risk zones.
    - **Completely exempt** from installing FGDs.

What is Flue Gas Desulphurisation (FGD) System?

- **FGD** is a pollution-control system used in **coal-fired thermal plants** to reduce **sulphur dioxide (SO_2)** emissions.
- It removes SO_2 by passing flue gases through a scrubber with **limestone or chemical sorbents**.
- SO_2 can otherwise form **secondary PM2.5** and lead to acid rain, respiratory diseases, and ecosystem damage.

Why Are Anti-Pollution Systems Necessary?

- **SO_2 → PM2.5 Formation**:
    - Studies show that **coal combustion contributes ~15%** of ambient PM2.5 in India (CEEW).
- **Health Impacts:**
    - SO_2 is linked to **asthma, heart diseases**, and **childhood bronchitis** (WHO).
- **Transboundary Pollution:**
    - Emissions from thermal plants travel **over 200 km**, affecting rural and urban areas alike.

Concerns with the Exemptions:

- **Rollback of Environmental Norms:** The 2015 mandate to install FGDs is effectively diluted for the majority of units.
- **Unfounded Scientific Claims:** Critics argue SO_2's contribution to PM2.5 is underestimated (Centre for Research on Energy and Clean Air).
- **Ignored Precautionary Principle:** Even if current SO_2 levels are below norms, **proactive pollution control** is essential as energy demand grows.
- **Health Cost vs. Capital Cost:** ₹2.5 lakh crore for full FGD compliance may appear high, but **public health costs and productivity losses** are likely far greater.

Way Ahead

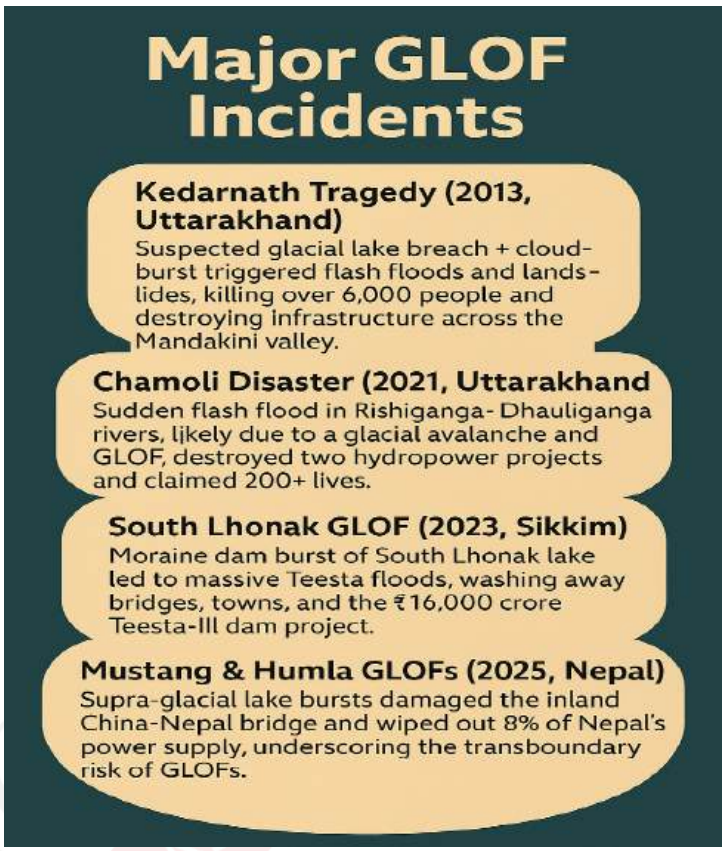
- **Prioritise Most Polluted Zones:** Ensure immediate FGD installation in all **NCR, CPA, and NAC clusters** without exception.
- **Incentivise Retrofit Mechanisms:** Offer **subsidies or green loans** to ease installation burden on power plants.
- **Public Health Audit:** Conduct **health impact assessments** near major thermal clusters to guide future policy.
- **Strengthen Monitoring:** Mandate **real-time SO_2 monitoring** and public disclosure for all thermal units.
- **Push for Cleaner Alternatives:** Promote **renewable energy adoption** to reduce dependence on coal-based power.

Conclusion:

The exemption of 78% of thermal power plants from installing FGDs marks a regressive shift in India's pollution control pathway. While cost and feasibility concerns exist, public health and environmental protection must remain central to energy governance. A balanced, science-backed and health-first policy is the need of the hour.

Topics: Disaster and management.

GLACIAL LAKE OUTBURST FLOODS (GLOFS)



Context:

Nepal recently witnessed multiple catastrophic GLOF events, including one on July 8, 2025, that washed away a key China-built friendship bridge and crippled hydropower projects.

- This has raised alarm across the Himalayan region, including India, where warming temperatures are increasing the risk of similar events in glacial lake belts of Sikkim, Ladakh, and Uttarakhand.

About Glacial Lake Outburst Floods (*GLOFs*):

What is a Glacial Lake Outburst Flood (GLOF)?

A GLOF is the **sudden release of water** from a glacial lake, often caused by the collapse of moraine or ice dams. These floods are high-velocity and high-volume, posing serious risks to **life, infrastructure, and the ecosystem**, particularly in the Indian Himalayan Region (IHR).

Causes of GLOFs:

Natural Causes:

1. **Glacial Retreat and Lake Formation:** Rising temperatures in the Himalayas are accelerating glacial melt, leading to formation of unstable moraine-dammed or supraglacial lakes.
   E.g. India has over 7,500 glacial lakes, many above 4,500 m altitude.
2. **Ice or Rock Avalanches:** Falling ice or rock into a glacial lake displaces water and causes waves that breach the dam.
   E.g. South Lhonak lake in Sikkim (2023) was destabilized by an avalanche.
3. **Heavy Rainfall and Cloudbursts:** Sudden, intense rains increase water volume rapidly, stressing moraine dams.
   E.g. Kedarnath GLOF (2013) followed a cloudburst.
4. **Seismic Activity:** Earthquakes can destabilize loose moraine structures, leading to dam breaches.
   E.g. Uttarakhand is in Seismic Zone IV & V—highly vulnerable.
5. **Internal Seepage (Piping):** Slow erosion from within moraine dams due to seepage weakens the dam over time.

Anthropogenic Causes:

1. **Unregulated Construction:** Hydropower and road projects near glacial zones disturb fragile landscapes.
   E.g. Teesta-III Dam was destroyed in 2023 due to lack of buffer zones.
2. **Climate Change:** Human-induced emissions are accelerating glacial melt rates globally, increasing GLOF events.
   E.g. 2023 and 2024 were the hottest years on record globally.

Types of Glacial Lakes in the Himalayas

1. **Supraglacial Lakes:** Form on top of glaciers from meltwater. Highly unstable during summer.
   E.g. Seen frequently on Tibetan side, as in the July 2024 Nepal GLOF.
2. **Moraine-Dammed Lakes:** Form at glacier snouts, dammed by loose debris. Prone to breach due to low cohesion.
   E.g. South Lhonak (Sikkim), Tsho Rolpa (Nepal).

Impacts of GLOFs:

On Human Settlements and Infrastructure:

- **Loss of Life:** Sudden floods can drown entire villages.
  E.g. Kedarnath (2013) saw hundreds of deaths.
- **Damage to Hydropower & Transport:** GLOFs damage bridges, roads, dams, and disrupt energy supply.
  E.g. 1200 MW Teesta-III project wiped out in 2023.
- **Displacement and Livelihood Loss:** Affects

agriculture, homes, and leads to economic insecurity.

On Environment and Ecology:

- **Riverbed Silting and Course Shifts:** Excessive debris raises riverbeds and alters river flow.

  E.g. Teesta riverbed has risen by several metres post-2023 GLOF.
- **Habitat Disruption:** Biodiversity in alpine and riparian zones gets fragmented or destroyed.
- **Long-Term Ecosystem Changes:** Persistent sedimentation and changing water regimes reduce ecosystem resilience.

NDMA's 5-Point Strategy to Mitigate GLOF Risks:

1. **Hazard Assessment:** Identified 195 high-risk glacial lakes and classified them by size, dam type, and downstream vulnerability.
2. **AWWS (Automated Weather & Water Stations) Installation:** Automated stations in Sikkim relay real-time data every 10 minutes on rainfall, temperature, and water levels.
3. **Early Warning Systems (EWS):** Manual alerts via ITBP in remote zones; digital multilingual alerts piloted in Uttarakhand and Arunachal.
4. **Engineering Interventions:** Conducted bathymetry and ERT scans; built artificial channels to safely drain lake water.
5. **Community Involvement:** Engaged locals in surveys; addressed religious sensitivities to ensure smooth implementation.

India's Measures to Mitigate GLOF Risk:

1. **Institutional Mechanisms:**
   - **NDMA's National GLOF Programme:** A $20 million initiative targeting 195 high-risk lakes, categorized into 4 risk levels.
   - **Committee on Disaster Risk Reduction (CoDRR):** Brings together States, research institutions, and central agencies for coordinated action.
   - **16th Finance Commission Allocation Plan (FY27–31):** Scaling up GLOF mitigation as part of climate-resilient infrastructure.
2. **Technological Measures:**
   - **SAR Interferometry for Slope Monitoring:** Detects micro-changes in glacier slope stability up to centimetre precision.
   - **Electrical Resistivity Tomography (ERT):** Identifies presence of ice-cores in moraine dams, a major failure risk.
   - **UAV and Bathymetric Surveys:** Used to measure lake volume and surrounding terrain vulnerabilities.
3. **Community Engagement:**
   - **Involving Local Communities in Expeditions:** Ensures cultural sensitivity and local participation in monitoring efforts.
   - **Manual Early Warning via ITBP:** In areas without AWWS, ITBP acts as sentinels for danger signs.
   - **Expeditions to 40 High-Risk Lakes in 2024:** multi-institutional fieldwork done in Ladakh, J&K, HP, UK, Sikkim, and Arunachal.

Conclusion:

Glacial Lake Outburst Floods (GLOFs) are an escalating threat in the Indian Himalayas due to warming temperatures, seismic vulnerability, and unplanned development. India has transitioned from reactive relief to proactive risk reduction, using tech-driven monitoring and local partnerships. Long-term resilience needs sustained investment in early warning systems, cross-border data sharing, and Himalayan climate adaptation.

DROUGHT HOTSPOTS AROUND THE WORLD 2023-2025

Context:

The UN Convention to Combat Desertification (UNCCD) and the U.S. National Drought Mitigation Centre released a Drought Hotspots Around the World 2023-2025 report highlighting intensifying drought hotspots between 2023–2025.

Key Summary of Report Drought Hotspots Around the World 2023-2025:

1. **Global Escalation:** Droughts have intensified across Africa, the Mediterranean, Latin America, and Asia — termed "slow-moving catastrophes."
2. **Africa's Hunger Emergency:** Over 90 million people in Eastern and Southern Africa face acute hunger; maize crop losses in Zimbabwe crossed 70%.
3. **Energy Crisis in Zambia:** Zambezi River flow dropped to 20% of its long-term average, leading to 21-hour daily power blackouts and halted essential services.
4. **Spain's Olive Oil Crash**: Two years of drought cut Spain's olive oil output by 50%, triggering price surges across Europe.
5. **Panama Canal Disruption:** Drought reduced daily transits from 38 to 24 ships, disturbing global trade

and food prices.

6. **Amazon River Crisis:** Lowest water levels on record stranded communities, killed river dolphins, and exposed ecological vulnerability.
7. **Child Marriages & Dropouts:** Drought-linked poverty doubled child marriages in Ethiopia and caused mass school dropouts in Zimbabwe.
8. **Wildlife Loss:** Over 100 elephants died in Zimbabwe; 200+ river dolphins perished in the Amazon due to extreme heat and water scarcity.

India and Drought Hotspots:

- **Monsoon Variability:** India faces increasing intra-seasonal rainfall variability, worsening water security and crop yield uncertainties.
- **Food Price Vulnerability:** As droughts reduce rice and sugar output in Asia, India sees rising pressure on food prices and inflation.
- **Hydrological Stress:** River basins such as Godavari and Krishna face recurrent drought conditions due to over-extraction and mismanagement.
- **Socioeconomic Impact:** Drought-prone states like Maharashtra, Rajasthan, and Karnataka experience farmer distress and migration pressures.

Factors Driving Drought Hotspots:

- **Climate Change:** Rising global temperatures intensify evapotranspiration, leading to prolonged dry spells and failed rains.
- **El Niño Amplification:** The 2023–2024 El Niño event exacerbated dry conditions across critical agricultural belts worldwide.
- **Overexploitation:** Unsustainable groundwater extraction, deforestation, and mismanaged irrigation aggravate hydrological imbalance.
- **Poor Governance:** Inadequate early warning systems and lack of adaptive land and water policies deepen vulnerability.

Impacts of Drought Hotspots:

- **Food Insecurity:** Droughts have triggered a 100% rise in maize prices in Zambia and threatened staple crops like wheat and rice globally.
- **Energy Collapse:** Hydropower shortages in Zambia and Türkiye disrupted electricity for hospitals, factories, and homes.
- **Biodiversity Loss:** Droughts caused mass wildlife deaths—100 elephants in Zimbabwe and thousands of fish and dolphins in Amazonia.
- **Forced Migration & Malnutrition:** Somalia and Amazon regions saw mass displacement and acute child malnutrition rise to emergency levels.

Recommended Measures:

- **Early Warning Systems:** Establish real-time monitoring of drought and impact pathways to trigger faster responses.
- **Nature-Based Solutions:** Restore watersheds, promote drought-resistant indigenous crops, and reforest degraded lands.
- **Gender-Sensitive Adaptation:** Protect women and girls from drought-linked vulnerabilities such as child marriage and education loss.
- **Transboundary Cooperation:** Protect river basins and trade routes through international partnerships.
- **Drought-Resilient Infrastructure**: Invest in off-grid power, water harvesting systems, and sustainable agriculture technologies.
- **Financial Mobilization:** Scale up climate financing through platforms like IDRA for preparedness in developing countries.

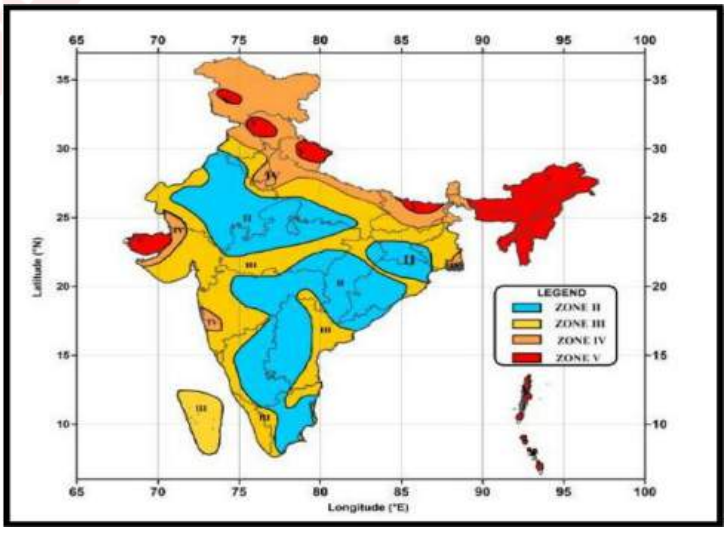
Conclusion:

Droughts are not isolated weather events but system-wide emergencies affecting ecosystems, economies, and people. The 2023–2025 hotspots are a stark warning to prioritize global cooperation, resilient planning, and inclusive adaptation. Without urgent action, these "creeping catastrophes" could become the norm in a warming world.

INDIA EARTHQUAKE RESILIENCE

Context:

A 4.4 magnitude earthquake in Delhi, exposed serious gaps in urban seismic resilience. With rising regional tremors, experts are calling for strict seismic code enforcement nationwide.



About India Earthquake Resilience:

What is Earthquake Resilience?

- **Definition:** Earthquake resilience refers to the ability of infrastructure, communities, and institutions to withstand and recover from seismic shocks with minimal damage and disruption.
- **Global Context:** Rising global seismic events—Myanmar (7.7), Tibet (5.7), Greece (6.2)—indicate tectonic unrest, underscoring the urgency for

preparedness.

India's Vulnerability to Earthquakes:

- **59% of India** is earthquake-prone across Zones II–V (BIS classification).
- **Seismic Zone V** includes the Himalayan belt, NE states, Andaman & Nicobar Islands — highly vulnerable due to tectonic convergence (4–5 cm/year drift).
- **Cities at Risk:** Delhi (Zone IV, PGA 0.24g), Guwahati (Zone V, floodplain risk), Bhuj, Srinagar, and Gangtok face chronic seismic threats

Major Past Earthquakes in India:

- **Kangra Earthquake, 1905:** Magnitude 8.0, over 19,800 lives lost.
- **Bhuj Earthquake, 2001:** Magnitude 7.9, 12,932 deaths, 890 villages devastated.
- **Nepal Quake, 2015:** Magnitude 7.8, impacted Bihar, UP, and Delhi with widespread tremors.
- **Delhi Earthquake, Feb 2025:** Magnitude 4.0, 159 earthquakes recorded in just 4 months.

Present Vulnerabilities of India:

- **Outdated Infrastructure:** Over 80% of Delhi's buildings, especially pre-2000 constructions, do not meet seismic safety standards (IS 1893:2016), posing serious collapse risks during tremors.
- **Urban Liquefaction Zones:** Cities like East Delhi, Guwahati, and Gangtok are built on soft, water-saturated soils, increasing the risk of soil liquefaction and building failure during earthquakes.
- **Overcrowded Urban Centres:** Delhi's population of 33.5 million and 5,000+ high-rises intensify the threat of mass casualties in case of a high-magnitude quake.
- **Enforcement Gaps:** Weak implementation of seismic codes, lack of retrofitting enforcement, and poor citizen awareness continue to expose cities to preventable disasters.

Key Government Initiatives for Seismic Safety:

- **NDMA & Disaster Management Act (2005):** Established NDMA, NDRF, and SDMAs to institutionalize disaster risk reduction and response planning at national and state levels.
- **Increased Seismic Observatories**: India expanded its monitoring capacity from 80 stations in 2014 to 168 in 2025, enhancing early detection and seismic data coverage.
- **BhooKamp App**: Launched by NCS, this mobile app provides real-time earthquake alerts to citizens, improving public preparedness and rapid response.
- **Earthquake Risk Indexing (EDRI):** Risk profiling of 50 cities has been completed; an additional 16 cities are being added to guide urban planning and retrofitting priorities.
- **Simplified Building Codes (2021):** The updated codes reduce technical complexity, enabling better compliance and safer construction practices, especially in small towns.
- **Retrofitting Guidelines:** Government promotes structural retrofits like shear walls, ductile reinforcements, and jacketing for ageing, non-compliant buildings.
- **Himalayan EEW Systems**: Early warning systems are being piloted in Seismic Zone V areas to issue seconds-early alerts that can save lives during strong quakes.

Way Ahead:

- **Strict Enforcement of BIS Codes:** Cities must ensure compliance with seismic standards like IS 1893 and IS 4326 to minimize structural failures during quakes.
- **Retrofitting Mission:** Launch a nation-wide audit and retrofitting of vulnerable schools, hospitals, and government buildings using modern techniques.
- **Urban Planning Reform:** Ban construction on high-risk liquefaction zones and mandate base-isolated foundations in critical infrastructure.
- **Annual Budgetary Allocation:** Experts recommend earmarking ₹50,000 crore per year to fund retrofitting, seismic audits, and risk reduction projects.
- **Public Awareness Drives:** Nationwide drills, school awareness programs, and promotion of household earthquake kits are vital to building citizen readiness.

Conclusion:

India's seismic vulnerability is rising, with urban expansion colliding with tectonic instability. Strengthening infrastructure, enforcing seismic codes, and educating citizens must become national priorities. Earthquake resilience is not a luxury—it's a survival imperative.

Topics: Challenges to internal security through communication networks, role of media and social networking sites in internal security challenges, basics of cyber security; money-laundering and its prevention

FATF'S COMPREHENSIVE UPDATE ON TERRORIST FINANCING RISKS 2025

Context:

The FATF's 2025 report highlights how accused in major terror incidents in India—including the Gorakhnath attack and Pulwama bombing—used online payment platforms, VPNs, and e-commerce sites to fund and execute terrorism.

Summary of FATF's Comprehensive Update on Terrorist Financing Risks 2025:

1. **Digital Tools in Terror Financing:** Increasing use of **e-commerce**, **crypto assets**, **VPNs**, and **fintech platforms** to fund terrorist activities anonymously.
   E.g.: Gorakhnath attacker used PayPal and VPNs to fund ISIL-linked operations.
2. **Terrorist Abuse of E-Commerce (EPOMs):** Terrorists exploit **e-commerce platforms** (like Amazon) to purchase materials covertly.
   E.g.: Pulwama bomber bought aluminium powder via Amazon.
3. **Crypto & Anonymity Tools:** Growth in **unregulated crypto markets** and **mixer services** pose serious tracking challenges for investigators.
4. **Third-Party Payment Gateways:** Online intermediaries are used to route funds between foreign sources and terrorists, complicating traceability.
5. **Lone Actor Threats Rising:** Radicalised individuals act independently, often funded via **online crowdfunding**, **social media**, or **gaming platforms**.
6. **Trade-Based Terror Financing:** Use of under/over-invoicing via online storefronts to launder funds and move value undetected.
7. **Geographic Spread:** South Asia, West Africa, Sahel, and Middle East remain high-risk regions; India cited as a critical case study.
8. **Global Weak Oversight:** Many jurisdictions lack sufficient **KYC, AML, and CTF frameworks** for digital platforms.

Role of Digital Technology in Terror Activities:

- **E-commerce use:** Terrorists procure explosives and raw materials through online marketplaces, bypassing regulatory oversight.
  E.g. Aluminium powder for the Pulwama attack was bought via Amazon.
- **Cryptocurrencies:** Digital currencies offer anonymous, borderless transactions without reliance on formal banking, making detection difficult.
  - This allows groups like ISIS to raise funds covertly via blockchain wallets.
- **VPNs & Encrypted Apps:** Virtual Private Networks mask user locations and encrypted apps prevent interception of communications.
  - Terror suspects use these tools to coordinate attacks while avoiding law enforcement detection.
- **Crowdfunding Platforms:** Terror-linked campaigns are launched under social causes to attract global donors without disclosing real intent. Funds raised this way are diverted to finance radicalisation and weapons procurement.

Challenges in Countering Digital Terrorism

- **Jurisdictional Gaps:** Transactions often span multiple countries, complicating legal access and law enforcement cooperation.
- **Dark Web Use:** Terrorists use the dark web to buy arms, communicate, and move crypto, evading traditional surveillance.
- **Weak KYC Norms:** Many fintech platforms fail to verify user identity rigorously, allowing fake accounts to move funds freely.
- **Evolving Modus Operandi:** Terror groups quickly adapt to new tech tools and digital platforms, outpacing existing regulations.
- **Data Localisation Loopholes:** When service providers store data abroad, investigators face legal hurdles in retrieving crucial information.

Recommended Measures:

- **Strengthen Digital KYC:** Mandate stringent verification procedures for all online transactions, especially on wallets and marketplaces. **Real-Time Monitoring:** Deploy AI/ML-based systems to track abnormal spending patterns and keyword-linked purchases.
- **Cross-Border Data Sharing:** Create mutual legal assistance treaties (MLATs) and data exchange protocols with tech-hosting nations.
- **Crypto Regulation:** Introduce binding guidelines for crypto exchanges to report suspicious activity and maintain audit trails.
- **Platform Accountability:** E-commerce platforms must monitor and flag purchases of dual-use materials and verify seller legitimacy.

Conclusion:

The FATF's findings underscore the **urgent need for robust digital oversight**, especially as technology becomes central to modern terror operations. India's experiences reflect a global trend of **tech-enabled terrorism**. Strengthening institutional and legal responses is crucial for national and global security.

PYQ:

2. Winning of Hearts and Minds in terrorism-affected areas is an essential step in restoring the trust of the population. Discuss the measures adopted by the Government in this respect as part of the conflict resolution in Jammu and Kashmir. (2023)

FACTS FOR PRELIMS GENERAL STUDIES – 1

Topics: Indian culture will cover the salient aspects of Art Forms, Literature and Architecture from ancient to modern times.

MERA GAON MERI DHAROHAR' (MGMD) INITIATIVE

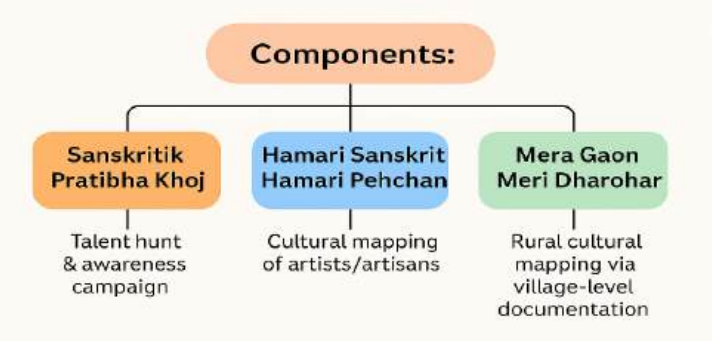
Context: Over 4.7 lakh villages have been culturally documented under the 'Mera Gaon Meri Dharohar' (MGMD) initiative, as informed by the Ministry of Culture in Parliament.

About Mera Gaon Meri Dharohar (MGMD) Initiative:

- **What it is?**
  - A nationwide cultural mapping project to document the **intangible cultural heritage** of Indian villages.
- **Launched in: June 2023**, under the **Azadi Ka Amrit Mahotsav** celebrations.
- **Aim:** To map, preserve, and digitally archive traditional knowledge systems, rituals, oral traditions, festivals, and local art forms across **6.5 lakh villages**.
- **Features:**
  - Implemented by **IGNCA**.
  - Cultural database of over **4.7 lakh villages** already created.
  - 360° video documentation of **750 villages**.
  - Development of **MGMD Web Portal** as the **National Cultural Workplace (NCWP)**.
  - Part of *National Mission on Cultural Mapping*.
  - User-editable data, artist registrations, UICs, and link to welfare schemes.

About National Mission on Cultural Mapping (*NMCM*):

- **What it is?**
  - A flagship mission to **digitally map India's cultural ecosystem** and empower artist communities.
- **Launched in:** By the **Ministry of Culture**, Government of India.
- **Aim:**
  - Identify and promote **cultural assets**.
  - Create a **national database of artists and art forms**.
  - Foster rural development and **self-reliant village economies** via cultural industries.



- **Key Features:**
  - Creation of **National Digital Inventories**.
  - **Virtual Living Museum**, digital badges, and village travel passports.
  - **Cultural event uploads**, **artist branding**, and ranking via UIC.
  - Integration with **government welfare schemes**.

CHAUTAL

Context:

Prime Minister of India shared a video of a Bhojpuri Chautal performance during his visit to Port of Spain, Trinidad & Tobago, highlighting the cultural connection between India and the Indian diaspora.

About Chautal:

- **What it is?**
  - Chautal (also spelled Chowtal or Chartal) is a traditional **12-beat rhythmic cycle (tāl)** used in Indian classical music, especially associated with the **dhrupad** style and **pakhawaj** percussion.
- **Origin:**
  - Chautal originated in **North Indian classical traditions**, particularly within the **dhrupad** genre.
  - The name Chautal means "four claps," referring to the tala's **vibhag (division) structure**.
- **Characteristics:**
  - It consists of **12 matras (beats)**.
  - There are **two schools of thought** on its structure:
    - One follows **four vibhags** of 4, 4, 2,

2 beats (all claps, no waves).
        - Another treats it like **Ektal**, with **six vibhags** of 2 beats (clap-wave alternation).
    - Played mostly in **medium tempo**, never extremely fast or slow.
    - Emphasizes **powerful, weighty playing**, especially on pakhawaj.
    - It often lacks a fixed theka (standard repeated pattern); instead, **"thapi"**—a more fluid, improvisational structure—is followed.
- **Instrument Used:**
    - **Pakhawaj** is the primary percussion instrument used for Chautal.
    - Unlike tabla-based styles, pakhawaj allows more **freedom for improvisation** and expressive rhythm cycles.
- **Significance:**
    - Strongly associated with the **dhrupad tradition**, India's oldest surviving form of classical music.
    - Reflects **spiritual depth, tradition, and power** in rhythm.

INDIA 44TH WORLD HERITAGE SITE - MARATHA MILITARY LANDSCAPES OF INDIA

Context:

At the 47th Session of the UNESCO World Heritage Committee in Paris, the Maratha Military Landscapes of India was inscribed as India's 44th World Heritage Site, marking a historic recognition of India's fortified legacy.

About India 44th World Heritage Site - Maratha Military Landscapes of India:

- **What is it?**
    - A network of **12 strategic forts built between the 17th–19th centuries CE** showcasing the **military ingenuity of the Maratha Empire**—known for their adaptability, architecture, and command over diverse terrains.
- **Locations Covered:**
    - **Maharashtra (11 forts):** Salher, Shivneri, Lohgad, Khanderi, Raigad, Rajgad, Pratapgad, Suvarnadurg, Panhala, Vijaydurg, Sindhudurg
    - **Tamil Nadu (1 fort):** Gingee Fort
- **Historical Context:**
    - Developed during the rise of the **Maratha Empire**, these forts formed a defensive belt using natural landscapes for protection.
    - Reflected Shivaji Maharaj's military vision and emphasis on **self-reliant fort defence systems**.
- **Unique Features:**
    - **Hill Forts:** Shivneri, Lohgad, Raigad, Salher, Gingee – integrated with rugged hill terrain.
    - **Island Forts:** Sindhudurg, Khanderi, Suvarnadurg – surrounded by the Arabian Sea.
    - **Plateau and Forest Forts:** Panhala (plateau), Pratapgad (hill-forest).
    - Forts display **adaptive design**, built with local materials and regional architecture.
    - Recognized under **UNESCO Criteria (iv) & (vi)** – for architectural, military, and cultural continuity.

About UNESCO World Heritage Sites in India:

- **What is a UNESCO World Heritage Site?**
    - A site inscribed for its **Outstanding Universal Value (OUV)** in terms of cultural, natural, or mixed heritage, governed by the **1972 World Heritage Convention**.
- **India's Global Ranking:**
    - India has 44 World Heritage Sites (as of July 2025).
    - **Ranks 6th globally**, **2nd in Asia-Pacific**, just behind China.
    - **62 sites** currently on India's **Tentative List**.
- **Governing Agencies:**
    - **Archaeological Survey of India (ASI)** is the nodal agency for heritage management and proposals.
    - India is a member of the **UNESCO World Heritage Committee (2021–2025)**.

INDIAN HARMONIUM

Context:

The Indian harmonium was recently featured in a Building Blocks science article for its unique, non-electronic design and continued relevance in Indian classical, devotional, and folk music.

About Indian harmonium:

- **What Is the Harmonium?**
  - A **portable, hand-pumped reed instrument** made of wood, similar in size to a suitcase.
  - It produces music using **air flow and metal reeds**, not electricity or strings.
- **Musical Classification:**
  - Belongs to the **free-reed aerophone** family, related to the European reed organ.
  - Prominently used in **Indian classical, devotional (bhajan, qawwali), and folk traditions**, as well as in theatre and cinema.
  - The **Indian harmonium** is primarily used in **Hindustani Classical Music** (North Indian tradition).
- **How the Harmonium Works?**
  - **Air as Fuel:**
    - Operates through **bellows pumped by hand**, drawing room air through valves into a pressurised air chamber beneath the keys.
  - **Reed Vibration Mechanism:**
    - Pressing a key opens a **felt-lined pallet** that channels high-pressure air through **metal reeds**, making them vibrate and produce sound.
    - The pitch depends on the **reed's length, thickness, and material** (brass or phosphor-bronze).
  - **Sound Generation:**
    - Each vibrating reed **splits airflow into pulses**, generating rich sound waves.
    - The **wooden cavity** and materials like leather and cloth modify tone, creating **distinctive timbre**.
- **Key Features:**
  - **Manual Dynamics:** Volume and tone are controlled by **how hard or gently** the bellows are pumped, allowing for expressive dynamics like accents and fades.
  - **Multiple Reeds per Key:** Keys can activate multiple reeds across octaves using stop rods, enriching tone like a small organ.
  - **Octave Coupling Mechanism:** Some harmoniums allow one key to automatically depress another an octave apart, reducing finger strain.
  - **Weather & Tuning Adaptability:** Warm air affects pitch, so musicians carry screwdrivers to fine-tune reeds pre-performance.
  - **No Electricity Required:** Its self-contained, acoustic design allows uninterrupted performance even during power cuts or outdoor concerts.

LEGACY OF CHOLA

Context:

Prime Minister of India during the birth anniversary of Rajendra Chola I at Gangaikonda Cholapuram, highlighted the Chola dynasty's contributions to India's maritime strength, democratic systems, and cultural unity.

- He announced statues of Rajendra and Rajaraja Chola and launched a commemorative coin.

About Legacy of Chola:

Who Were the Cholas?

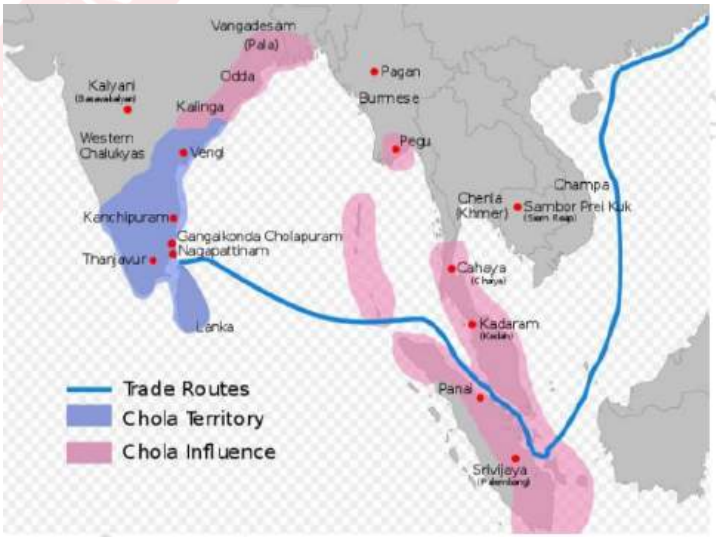
- The Cholas were one of the longest-ruling dynasties in South India, flourishing between the **9th to 13th century CE**.
- Their empire stretched across present-day **Tamil Nadu, Andhra Pradesh, Kerala**, and overseas territories like **Sri Lanka and parts of Southeast Asia**

Key Chola Rulers and Their Contributions:

- **Rajaraja Chola I (985–1014 CE):**
  - Strengthened naval power, built the **Brihadisvara Temple** at **Thanjavur**, and expanded the empire into Sri Lanka.
- **Rajendra Chola I (1014–1044 CE):**
  - Led expeditions to the **Ganga River**, built **Gangaikonda Cholapuram**, and extended influence to **Malaysia, Indonesia, and the Maldives**.
- **Kulottunga Chola I:**
  - Focused on internal administration and **revenue reforms**, continuing the legacy of stability.

Legacy of the Chola Dynasty:

1. **Political & Administrative Legacy:**
   - **Kudavolai System:** A unique electoral practice for choosing local representatives using palm leaf ballots (Kudavolai), marking the beginning of self-governance in rural India. **E.g.** Uthiramerur inscriptions provide detailed rules for local governance and elections.
   - **Decentralised Village Administration:** Power was devolved to **Ur**, **Sabha**, and **Nagaram** assemblies for land management, tax collection, and judicial functions, setting a precedent for grassroots democracy.
   - **Efficient Bureaucracy:** Maintained a hierarchical administrative structure with clear job definitions — from ministers (Amatyas) to village accountants. Regular land surveys and revenue records (like 'Chola inscriptions') were maintained.
2. **Economic & Trade Networks:**
   - **Maritime Trade Expansion:** Developed strong trade links with **Southeast Asia (Srivijaya), China (Song Dynasty)**, and **Arab regions**. Chola ports like **Poompuhar and Nagapattinam** served as global trading hubs.
   - **State-Supported Commerce:** State granted charters to merchant guilds like **Manigramam** and **Ayyavole 500**, encouraging overseas commerce and internal trade.
   - **Irrigation & Agricultural Reforms:** Built large-scale tanks like **Cholagangam at Gangaikonda Cholapuram**, canals, and embankments, increasing agricultural surplus and sustaining temple economies.
3. **Foreign Policy & Maritime Power:**
   - **Naval Expeditions:** Rajendra Chola, I led naval campaigns across the Bay of Bengal to **Sri Lanka, the Maldives, and the Srivijaya kingdom (Sumatra)** — one of the earliest examples of Indian maritime assertion.
   - **Cultural Hegemony through Trade and Temples:** Chola influence is visible in Southeast Asian temples like **Angkor Wat (Cambodia)** and **Borobudur (Indonesia)**, spread via trade and temple-building traditions.
   - **Diplomatic Relations:** Maintained embassies and diplomatic exchanges with China; Chinese chronicles record the arrival of Chola envoys in the Song court.
4. **Cultural & Religious Syncretism:**
   - **Religious Patronage:** Supported both **Shaivism and Vaishnavism,** facilitating peaceful coexistence and growth of temples and mathas across the empire.
     E.g. Shaiva temples like Brihadisvara and Vishnu temples like Veeranarayana (Tirumangai Alvar's site).
   - **Temple as Socio-Cultural Centre:** Temples doubled as schools (ghatikas), granaries, judicial centres, and repositories of art and dance. They were fully integrated into public life.
   - **Literary Flourishing:** Supported Tamil poets and scholars like **Kamban (Ramavataram), Ottakoothar, Jayamkondar**, and **Sekkizhar**. Their works enriched both religious and secular Tamil literature.
5. **Art & Architecture:**
   - **Dravidian Temple Architecture:** Refined the South Indian temple structure with monumental vimanas (towering sanctums), pillared mandapas, and axial alignment. **E.g. Brihadisvara Temple (Thanjavur)** and **Gangaikonda Cholapuram** exemplify Chola architectural zenith.
   - **Bronze Sculpture Excellence:** Perfected the technique of lost-wax bronze casting. The **Chola Nataraja** (cosmic dance of Shiva) remains an iconic masterpiece of Indian art.
   - **Architectural Innovation:** Use of **granite**, axial temple layouts, precision in iconometry (Shilpa Shastra), and intricate carvings set the model for later South Indian dynasties like Vijayanagar.



Decline of the Cholas:

- After 13th century, they declined due to **internal conflicts**, **Pandya resurgence**, and **foreign invasions** (Delhi Sultanate).
- Last remnants fell under the influence of the **Vijayanagara Empire**.

Relevance to Modern India

1. **Decentralised Governance:** Their village panchayat model mirrors modern grassroots democracy.
2. **Naval Strategy:** Acknowledged for maritime dominance — shaping India's Blue Economy outlook

today.

3. **Cultural Diplomacy:** Their civilisational links with Southeast Asia reinforce Act East Policy.
4. **Heritage Conservation:** Temples like Brihadisvara are UNESCO World Heritage Sites.
5. **National Pride:** Revival of Chola legacy promotes cultural nationalism and unity in diversity.

Conclusion:

The Chola dynasty epitomises a golden age of governance, maritime excellence, and cultural vibrance. Their administrative foresight and artistic legacy offer India a historical blueprint to harmonise modern development with civilisational pride.

GANGAIKONDA CHOLAPURAM

Context:

India is commemorating the 1000th anniversary of Rajendra Chola I's northern expedition, which led to the establishment of Gangaikonda Cholapuram, a grand Chola capital and a UNESCO-listed architectural marvel.

About Gangaikonda Cholapuram:

- **What is Gangaikonda Cholapuram?**
  - It was the imperial capital of the Cholas from **1025 CE to 1279 CE,** established by Rajendra Chola I.
  - Located in Ariyalur, Tamil Nadu, the city housed palaces, a massive water reservoir (Chola Gangam), and the Brihadisvara Temple (Gangaikonda Cholisvaram).
- **Built By:** Rajendra Chola, I built the city after his victorious **military expedition to the Gangetic plains.**
  - He assumed the title 'Gangaikonda Cholan' and brought Ganga water to pour into a tank, symbolising southern supremacy over the north.
- **Architectural Features:**
  - The Gangaikonda Cholisvaram Temple, dedicated to Lord Shiva, mirrors the grandeur of the **Thanjavur Brihadisvara Temple**.
  - It features intricate carvings, majestic vimanas, and a unique jalasthambam (liquid pillar of victory) — the Chola Gangam.
  - The city once boasted **fortified palaces, multiple royal buildings**, and wide, planned roads, as per inscriptions and Tamil literary works.
- **Epigraphic Evidence:**
  - The **Tiruvalangadu and Karanthai copper plates**, along with the Kalingattuparani and Muvar Ula, document the capital's glory.
  - Vira Rajendra's inscriptions refer to the palace as **Chola-Keralan Thirumaaligai**, showcasing the dynasty's titles and political vision.
- **Cultural and Political Significance:**
  - Gangaikonda Cholapuram was the nerve centre of south India's politics, trade, and culture for over two centuries.
  - It symbolised Chola dominance from the **Tungabhadra in the north to Sri Lanka in the south**.
  - Today, it remains one of the UNESCO World Heritage 'Great Living Chola Temples', along with the temples at Thanjavur and Darasuram.

RAJENDRA CHOLA I

Context:

India is commemorating 1,000 years of Rajendra Chola I's Southeast Asian expedition through cultural events and heritage projects.

About Rajendra Chola I:

- **Who he was?**
  - Rajendra Chola I (1014–1044 CE) was the **most powerful emperor** of the Chola dynasty, succeeding his father Rajaraja Chola I. He expanded the Chola Empire from **South India to the Ganga in the north** and deep into **Southeast Asia** through a historic **naval expedition in 1025 CE**.
- **Historical Background:**
  - Son of **Rajaraja Chola I**, he ruled the Chola Empire from **1014 to 1044 CE**.
  - Inherited a strong military state and expanded it into a maritime empire.
  - Established the capital **Gangaikonda Cholapuram** to mark his conquest of northern India.
- **Achievements and Contributions:**
  - **Military & Maritime Expansion:**
    - Led a **naval expedition in 1025 CE** to defeat the **Srivijaya empire**, asserting trade control over the **Malacca Strait**.
    - Extended Chola influence across **India, Sri Lanka, Maldives**, and **Southeast Asia** including **Thailand, Indonesia, Cambodia, Malaysia**.
    - Defeated the **Pala dynasty of Bengal**, symbolized by the title *"Gangaikondachola"* (Conqueror of the Ganga).
  - **Art & Architecture:**
    - Built the **Gangaikonda Cholapuram temple**, a Dravidian architectural marvel similar to the **Brihadeeswara Temple**.
    - Promoted **stone inscription records**, temple murals, and **bronze sculpture** traditions.
    - The temple reflects **Chola craftsmanship** and **urban planning** precision.
  - **Engineering & Water Management:**
    - Constructed the **Cholagangam Tank**, a man-made lake with advanced **sluice and sediment control**—irrigating over 1,500 acres.
    - The tank system reflected ecological foresight and **hydraulic engineering expertise**.
  - **Cultural Diplomacy & Trade:**
    - Supported merchant guilds like **Manigramam** and **Ayyavole**, enabling trade with **Southeast Asian ports**.
    - Encouraged **Tamil diaspora settlement**, temple-building, and local alliances abroad—building **soft power** centuries before the modern concept emerged.
  - **Administrative Legacy:**
    - Strengthened **village assemblies** (sabhas) and temple-based **revenue systems**.
    - Codified **land grants, irrigation records**, and **social welfare measures** through detailed inscriptions.

GURYUL RAVINE FOSSIL SITE

Context: The Geological Survey of India (GSI) has warned of severe threats to the Guryul Ravine fossil site in Kashmir due to ongoing quarrying and land diversion.

About Guryul Ravine Fossil Site:

- **What It Is?**
  - Guryul Ravine is a 260-million-year-old geological fossil site, capturing Earth's greatest mass extinction—the **Permian–Triassic boundary (PTB)**. It offers unmatched insight into ancient climate change and evolutionary events.
- **Located In:**
  - Situated in Khonmoh, on the outskirts of Srinagar, Jammu & Kashmir.
  - Geologically part of the Vihi District.
- **How It Formed?**
  - Formed during the **Permian–Triassic transition**, when volcanic activity, oxygen decline, and climate disruption triggered global die-offs.
  - Over time, **marine and terrestrial sediments** preserved fossil-rich strata.
- **Features of Guryul Ravine:**
  - **Permian–Triassic Marker:** Hosts rare fossil evidence of the '**Great Dying**' event that wiped out 90% of marine and 70% of terrestrial species.
  - **World's Oldest Tsunami Record:** Exposed layers contain geological proof of Earth's first known tsunami.
  - **Global Research Hub:** Visited by geologists from over 10 countries, including USA, Japan, and China, for academic studies.

- **Declared Fossil Zone:** Notified under Government Order of 2017 for protection of 9.8 lakh sqm.
- **Much Larger Than China's Meishan:** Its 3m-thick boundary section dwarfs China's 27cm fossil record, making it superior in scale and significance.

- **Significance of the Site:**
  - **Scientific Value:** Crucial for understanding past climate shifts and their relevance to today's environmental crisis.
  - **Heritage Importance:** Eligible for UNESCO Global Geopark and National Geological Monument status.

Tourism Potential: Offers rare geotourism value and can become a major attraction like Meishan in China

KASHI DECLARATION

Context:

The Youth Spiritual Summit concluded in Varanasi with the adoption of the Kashi Declaration, setting a national roadmap for youth-led action against drug abuse.

About Kashi Declaration:

- **What It Is?**
  - The **Kashi Declaration** is a national action plan adopted at the Youth Spiritual Summit to combat substance abuse through youth and spiritual leadership.
  - It emphasizes a **multi-dimensional, culturally rooted** framework to eliminate drug addiction from Indian society.
- **Declared By:** Initiated by the **Ministry of Youth Affairs and Sports** during the Youth Spiritual Summit 2025.
- **Objectives of the Declaration**
  - **Eradicate Drug Abuse**: Create a **Nasha Mukt Yuva** as the foundation of **Viksit Bharat** by 2047.
  - **Spiritual Mobilisation:** Use India's **spiritual capital** as a catalyst for healing and transformation.
  - **Whole-of-Society Approach:** Integrate families, communities, and institutions into **prevention and recovery**.
  - **Institutional Coordination:** Facilitate action through a **Joint National Committee** and regular reporting.
  - **Empower Youth Volunteers:** Enable youth clubs under the **MY Bharat platform** to lead awareness and de-addiction campaigns.
- **Features of the Declaration:**
  - **Plenary-Driven Agenda:** Built on four thematic sessions covering psychology, trafficking, awareness, and spiritual rehab.
  - **Multi-Ministerial Action Plan:** Involves Ministries of Youth, Social Justice, Culture, Labour, and Home Affairs.
  - **Annual Review Mechanism:** Includes progress tracking via Viksit Bharat Young Leaders Dialogue 2026.
  - **Digital Platform Monitoring:** Proposes counter-measures against online targeting of school children.
  - **Community-Based Outreach:** Launches grassroots campaigns, pledge drives, and support services via MY Bharat.

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ASHOKAN PILLAR

Context:

India unveiled a replica of the Ashokan Pillar at Waskaduwa Sri Subhuthi Viharaya, Sri Lanka, commemorating Emperor Ashoka's role in introducing Buddhism to the island.

About Ashokan Pillar:

- **Origin and Historical Context**
  - Built by **Emperor Ashoka (3rd Century BCE)** after the Kalinga war to communicate his moral transformation.
  - Marked the first architectural expression of Dhamma in India and across Asia.
- **Structural and Artistic Features:**
  - Pillars range **40–50 feet high**, made from **monolithic sandstone**, mostly from **Chunar and Mathura**.
  - Topped with lotus bases and animal capitals, especially lions, symbolizing purity and sovereign dharma.
- **Edicts and Moral Messaging:**
  - Inscriptions in **Brahmi, Kharosthi, Aramaic, and Greek** carried messages of non-violence, welfare, and justice.
  - Strategically placed near trade routes, pilgrimage sites, and capitals to influence citizens morally.
- **Symbolic Capitals:**
  - **Lion Capital** from Sarnath represents both **Buddha's clan (Shakya)** and **royal authority**. It is now India's National Emblem.
  - Capitals carved in the round, reflect **Persian-Achaemenid influence** but reimagined in Buddhist context.
- **Spread and Legacy:**
  - Helped propagate Buddhism across South Asia, Sri Lanka, and Central Asia without forced conversions.
  - Serve today as symbols of ethical governance, religious tolerance, and Indo-Buddhist identity.

PENICO: PERU'S NEWLY UNEARTHED ANCIENT CITY

Context:

Archaeologists have discovered a 3,500-year-old ancient city named Penico in northern Peru. It likely served as a major trade centre linking Pacific, Andean, and Amazonian cultures after the decline of the Caral civilization.

About Penico: Peru's Newly Unearthed Ancient City:

- **Located in:** Barranca Province, northern **Peru**, ~200 km north of Lima.
- **Altitude:** Situated on a hillside terrace ~600 meters above sea level.
- **Time Period:** Founded between **1800–1500 BCE**, contemporary to early civilizations of Egypt, Sumeria, and India.
- **Key Features of the Site:**
  - **Urban Center Layout:** A central circular structure surrounded by 18 identified buildings made of stone and mud.
  - **Structures Found:**
    - Ceremonial temples
    - Residential complexes
    - Central plaza with sculpted reliefs
  - **Artifacts Discovered:**
    - Clay figures (humans and animals)
    - Conch shell trumpets (*pututus*)
    - Beaded necklaces and ceremonial objects
- **Significance of Penico:**
  - **Trade Hub:** Strategically located for exchange between coastal, highland, and Amazonian societies.
  - **Post-Caral Evolution:** Considered a cultural **continuation of the Caral civilization**, which declined due to climatic disruptions.
  - **Cultural Insights:** Sheds light on urban development, trade, and ceremonial life in pre-Inca Peru.
  - **Civilizational Comparison:** Emerged independently during the same epoch as the Bronze Age civilizations but in geographic isolation.
- **Relation to Caral Civilization:**
  - Caral (3000 BCE) is the **oldest civilization in the Americas**, known for:
    - Monumental pyramids
    - Irrigation systems
    - Urban planning
  - Penico offers clues to **cultural transitions and resilience** following Caral's decline.

SOHRAI ART

Context:

Sohrai Art from Jharkhand was spotlighted at Kala Utsav 2025 held at Rashtrapati Bhavan, where President of India hailed it as reflecting "the soul of India."

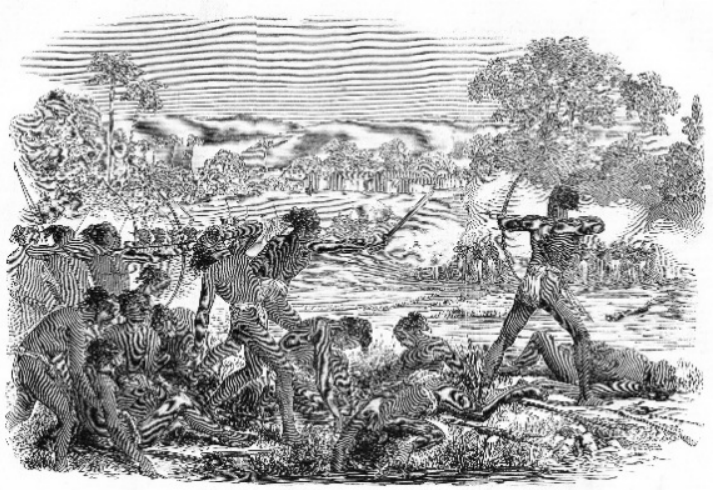
About Sohrai Art:

- **What is Sohrai Art?**
  - Sohrai is the **Santhal, Munda, and Oraon tribes.**
  - It is traditionally a ritual wall painting tradition practiced by tribal communities of **Jharkhand,** particularly created by **women** on the **mud walls of houses** using natural pigments and bamboo twigs.
- **When it's celebrated:**
  - Painted during **harvest festivals**, especially **Diwali**, to **honour livestock and fertility** of the land.
  - It is both a thanksgiving ritual and a celebration of agrarian life and womanhood.
- **Geographic Region:**
  - Practised across **Hazaribagh, Santhal Parganas**, and **bordering areas of Bihar**.
  - Spread from **cave art traditions** to village homes across **eastern India**.
- **Key Features of Sohrai Art:**
  - **Nature-Inspired Motifs:** Depicts animals, birds, trees, and rural life scenes symbolizing harmony with nature.
  - **Natural Pigments:** Uses earth-based colors like red ochre, white kaolin, black manganese, and yellow clay.
  - **Traditional Tools:** Bamboo twigs, chewed sticks, and cloth rags are used instead of modern brushes.
  - **Women-Led Art:** Entirely practiced and passed down by tribal women, reflecting feminine creativity and continuity.
  - **Ritualistic Timing:** Painted during Diwali and harvest, linked to thanksgiving for livestock and agrarian prosperity.
- **Cultural Significance:**
  - Represents sustainability, spiritual ecology, and livelihood resilience.
  - Symbolises the fusion of mythology, agriculture, and femininity.
  - Seen as a living tradition passed orally and artistically across generations.

Topics: Modern Indian history from about the middle of the eighteenth century until the present- significant events, personalities, issues.

SANTHAL REBELLION (HUL)

Context: Recently, the 170th anniversary of the Santhal Rebellion (Hul) was observed. The Jharkhand government commemorated the occasion as 'Hul Diwas'.



About Santhal Rebellion (*Hul*):

- **What was the Santhal Rebellion?**
  - The Santhal Rebellion, also called 'Hul' (meaning revolution), was a mass uprising by the Santhal tribal community against British colonial oppression, zamindari exploitation, and moneylenders' abuse in the Rajmahal hills region.
- **Key Timeline:**
  - **Year:** 1855–1856
  - **Leaders:** Sidhu Murmu, Kanhu Murmu, Chand Murmu, Bhairav Murmu
  - **Women warriors:** Phulo and Jhano Murmu
  - **Location:** Damin-i-Koh region (present-day **Santhal Parganas**, Jharkhand)
- **Causes of Rebellion:**
  - **Land Alienation**: British Permanent Settlement disrupted tribal landholding; lands were seized by zamindars.
  - **Economic Exploitation:** Santhals fell into debt traps through high-interest loans by moneylenders.
  - **Forced Labour:** Practices like kamioti and harwahi forced Santhals into bonded labour.
  - **Loss of Traditional Livelihood:** Displacement and disruption of subsistence farming led to deep distress.
  - **Corruption & Oppression:** British officials and intermediaries imposed unfair revenue systems and legal exploitation.
- **Sequence of Events:**
  - **June 30, 1855:** Sidhu and Kanhu declared rebellion at **Bhognadih village**.
  - **Mass Mobilisation:** 10,000+ Santhals declared autonomy between Rajmahal and Bhagalpur.
  - **Initial Successes:** Santhals used guerrilla tactics, attacking moneylenders and colonial agents.
  - **British Suppression:** Martial law declared; British used firearms and elephants to suppress revolt.
  - **End Phase (1856):** Both Sidhu and Kanhu were killed and the rebellion was brutally crushed.
- **Outcomes and Legacy:**
  - **Creation of Santhal Parganas (1856):** Separate administrative unit with tribal-focused governance.
  - **Santhal Parganas Tenancy Act (1876):** Protected Santhal land rights from non-tribal encroachment.
  - **Inspiration for Future Movements:** Set the tone for later tribal uprisings and contributed to India's resistance narrative.
  - **Cultural Legacy:** 'Hul Diwas' is celebrated annually and Santhal heroes honoured in folk songs and literature.

MACHILIPATNAM

Context:

Nearly 48% of construction of the Machilipatnam Greenfield Port in Andhra Pradesh is complete, with operations set to begin by end of 2026.

- This revival links back to Machilipatnam's ancient legacy as a thriving port city during the **Satavahana and Golconda eras.**

About Machilipatnam:

- **What is Machilipatnam?**
  - Machilipatnam (historically known as Masulipatnam or Bandar) is a coastal city in Krishna district, Andhra Pradesh, located at the mouth of the River Krishna along the

Bay of Bengal.

- **Ancient History & Trade Heritage:**
  - **Satavahana Era Port:** Thrived as a maritime hub as early as the 1st century AD, under the Satavahana rule.
  - **Medieval Prominence:** Flourished during Golconda Sultanate, famed for muslin and textile exports to Persia, Europe, and Southeast Asia.
  - **European Trade Posts:** Dutch, British, and French established factories here in the 17th century.
- **Decline of Masulipatnam:**
  - **Policy Shift:** Lost prominence in the 18th century when British colonial focus shifted to Madras (Chennai).
  - **Natural Siltation:** The port also suffered due to coastal sedimentation and lack of modernisation post-independence.
- **Strategic Importance in Modern Times:**
  - **Greenfield Port Revival:** Under construction at Manginapudi, with advanced engineering like tetrapods and breakwater protection.
  - **Capacity & Expansion:** Phase-I with 4 berths, expandable to 16 and projected capacity 36 MTPA, can handle 80,000-tonne ships.
  - **Inland Connectivity:** Telangana to build a dry port and freight corridor to connect with Machilipatnam.
  - **Export-Import Gateway:** Expected to handle coal, cement, pharma, fertilisers, and container cargo.
  - **Economic Multiplier:** Boost to employment, land value, and logistics infrastructure in Andhra Pradesh's coastal corridor.

PAIKA REBELLION

Context:

NCERT's latest Class 8 history textbook has omitted the **Paika Rebellion of 1817**, triggering political backlash in Odisha.

About Paika Rebellion:

- **What Was the Paika Rebellion?**
  - The **Paika Rebellion** (Paika Bidroha) was a large-scale armed uprising against British colonial rule in **1817**, led by **Bakshi Jagabandhu** in **Odisha**—decades before the 1857 Revolt.
- **Region Involved:**
  - **Core area:** Khurda district, Odisha.
  - **Spread:** Puri, Banpur, Ghumusar, and parts of tribal Odisha.
- **Key Causes of the Revolt:**
  - **Loss of Hereditary Land:** British land reforms removed Paikas' rent-free land grants.
  - **Cultural Disruption:** Rejection of Odia kingship and destruction of Barunei Fort.
  - **Economic Exploitation:** New currency policies and tax demands crushed locals.
  - **Salt Monopoly:** British salt trade restricted hill communities' livelihood.
  - **Peasant-Tenant Conflict**: Rising pressure from absentee Bengali landlords worsened tribal discontent.
- **Main Features of the Revolt:**
  - **Leadership:** Led by Bakshi Jagabandhu, a former commander of Khurda's king.
  - **Participation:** Involved Paikas, Kondhs, peasants, and tribal groups.
  - **Attacks:** Targeted police stations, treasuries, and British symbols of power.
  - **Scale:** Covered multiple districts and continued for months.
  - **Tactics:** Combined guerrilla raids with open armed confrontation.
- **Outcome of the Rebellion:**
  - **Suppressed by British:** The revolt was brutally put down by Company forces.
  - **Jagabandhu in Exile:** Went underground till his negotiated surrender in 1825.
  - **Symbol of Resistance:** Later emerged as a cultural and political symbol of Odia pride and anti-colonial resistance.
- **Significance:**
  - **Claim as First War of Independence:** Odisha government proposed it as the first such war, predating 1857.

Topics: The Freedom Struggle – its various stages and important contributors /contributions from different parts of the country.

SAVITRIBAI PHULE NATIONAL INSTITUTE OF WOMEN AND CHILD

DEVELOPMENT

Context:

The National Institute of Public Cooperation and Child Development (NIPCCD) has been renamed as the Savitribai Phule National Institute of Women and Child Development.

- A new **Regional Centre in Ranchi** will also be inaugurated to strengthen grassroots implementation of women and child welfare schemes in Eastern India.

About Savitribai Phule National Institute of Women and Child Development:

- **What is it?**
  - A premier autonomous body under the **Ministry of Women and Child Development**, serving as the national apex institute for training, research, and capacity-building in women and child welfare.
- **Historical Legacy**
  - **Renamed from NIPCCD** to honour **Savitribai Phule**, one of India's earliest women educationists and social reformers.
  - Reflects a renewed **commitment to inclusive and region-specific development** of women and children.
- **Headquarters**: New Delhi
  - Existing **Regional Centres**: Bangalore, Guwahati, Lucknow, Indore, Mohali
  - **New Centre:** Ranchi (to serve Jharkhand, Bihar, Odisha, West Bengal)
- **Objectives:**
  - To **strengthen capacity building** for the implementation of women and child development schemes.
  - To support **region-specific interventions** aligned with national missions like Mission Shakti, Vatsalya, Saksham Anganwadi and Poshan 2.0.
- **Functions:**
  - **Training**: Conducts in-service and induction training for ICDS, Poshan, and other related staff.
  - **Research & Extension:** Develops contextual solutions for gender, mental health, and adolescent welfare.
  - **Policy Support:** Offers evidence-based insights to strengthen WCD schemes at national and regional levels.
  - **Documentation & Innovation:** Archives best practices, module development, and digital training innovations.
  - **Frontline Empowerment:** Serves over 7 lakh field workers by enhancing local access to training and counselling.
  - **Academic Programmes:** Offers specialised diplomas like **Child Guidance and Counselling**, especially at the new Ranchi Centre.
- **Significance:**
  - **Decentralized Capacity Building:** Reduces dependency on distant centres for training in Eastern India.
  - **Empowerment at Grassroots:** Enhances last-mile delivery of services and strengthens local governance systems like **Panchayats**.
  - **Holistic Approach:** Integrates **mental health, education, and nutrition** for overall child and women welfare.

ALLURI SITARAMA RAJU

Context:

Union Defence Minister, at the 128th birth anniversary celebrations of Alluri Sitarama Raju, praised his contributions to India's freedom struggle and reaffirmed the government's goal to eliminate Maoist insurgency by August 2026.

About Alluri Sitarama Raju:

- **Who He Was?**
  - Alluri Sitarama Raju was a fearless revolutionary and freedom fighter known for leading a tribal uprising against British colonial rule.
  - Though not a tribal himself, he is revered for defending tribal rights and lives.
- **Region:** He was born on **4 July 1897** in **Mogallu village**, near **Bhimavaram** in present-day **Andhra**

Pradesh, and operated mainly in the **Eastern Ghats' Agency areas** of Andhra Pradesh.

- **Historical Background:**
  - **Early Life:** Raju received his early education in his village and later moved to Visakhapatnam.
    - By the age of 18, he renounced worldly life to become a **sanyasi**, travelling through forests and hills, and connecting deeply with tribal communities.
  - **Influence of Gandhiji:** Initially inspired by Mahatma Gandhi's **Non-Cooperation Movement**, he encouraged tribals to boycott British institutions.
    - When peaceful methods failed to bring change, he adopted **armed resistance**.
- **Major Contributions to India's Freedom Movement:**
  - **Leader of the Rampa Rebellion (1922–1924):**
    - He led the **Rampa Rebellion** against the British in response to the **Madras Forest Act, 1882**, which restricted tribal farming practices like **Podu cultivation** and displaced many from their lands.
    - Tribals were also forced into unpaid labour for road and rail construction, which intensified resentment.
  - **Guerrilla Warfare Against the British:** Raju mobilized tribal youth and formed a resistance army that conducted **guerrilla-style raids** on British police stations, seizing arms and killing colonial officers.
  - **Legacy and Martyrdom:** His success and growing influence led the British to place a **₹10,000 bounty** on his head.
    - In 1924, he was captured through deceit, **tied to a tree, and shot dead** on **7 May 1924**.
- **Legacy:**
  - Fondly remembered as **"Manyam Veerudu"** (Hero of the Jungle).
  - Honoured annually by the **Government of Andhra Pradesh**, which observes **July 4 as a state festival** in his memory.
  - He remains a symbol of **tribal resistance, justice, and sacrifice** in India's struggle for independence.

Topics: Salient features of Indian Society, Diversity of India.

HATTI TRIBE

Context:

A woman in Himachal Pradesh's Sirmaur district married two brothers from the Hatti tribe, reviving public and legal debate over the tribe's age-old polyandry custom known as **Jodidara or Jajda.**

About Hatti tribe:

- **Who Are the Hattis?**
  - The **Hattis** are a **Scheduled Tribe (ST)** recognized in **Himachal Pradesh** and found in **Trans-Giri region** and **Jaunsar Bawar** in **Uttarakhand**.
  - They derive their name from their historical role as **vendors in haats** (rural markets) where they sold local produce, wool, and meat.
- **What is Polyandry?**
  - Polyandry is a form of marriage where **one woman marries multiple men**. It is of two main types:
    - **Fraternal (Adelphic)**: All husbands are **brothers**.
    - **Non-Fraternal**: Husbands are **unrelated**, and share the woman by rotation.

- **Habitat and Geography:**
  - Inhabit **hilly regions** between the **Giri and Tons rivers**, both tributaries of the **Yamuna River**.
  - Spread across **Sirmaur district (HP)** and **Dehradun district (Uttarakhand)**.
  - Historically linked to the **Sirmaur princely estate** and British colonial expansion post-1814.
- **Cultural and Social Features:**
  - **Traditional Attire:** Hatti men wear **white headgear** on ceremonial occasions.
  - **Community Governance:** Governed by a **traditional council** called **Khumbli**, which arbitrates customs and disputes.
  - **Marriage Customs:** Known for **polyandrous practices**, community celebrations, and strong kinship systems.
  - **Inter-clan marriages** are frequent between Hattis in HP and Uttarakhand.
- **Polyandry in Hatti Tribe:**
  - **Customary Practice:**
  - Locally called **Jodidara** or **Jajda**, where **two or more brothers marry a single woman**.
  - Ritual includes **"Seenj"** ceremony at the groom's house.
- **Reasons for Polyandry:**
  - **Preservation of Land**: Prevents division of agricultural holdings.
  - **Family Security**: Ensures manpower for farming and safety in isolated regions.
  - **Economic Efficiency**: Supports collective care of livestock and scattered fields.
  - **Promotes Brotherhood**: Strengthens joint family bonds, even among half-siblings.
- **Polyandry and Indian Law:**
- **General Legal Framework:**
  - **Polyandry is not legally valid** under:
    - Hindu Marriage Act, 1955
    - Special Marriage Act
    - Section 82 of the Bharatiya Nyaya Sanhita (BNS): Bigamy is punishable.
- **Exception for Scheduled Tribes:**
  - Hindu Marriage Act **excludes Scheduled Tribes** unless notified by the Central Government.
  - Customary practices, if ancient, reasonable, and not against public policy, may be legally valid.
  - Section 13 of Indian Evidence Act allows proof of customs in civil matters.

Topics: Women and women related issues.

INTERNAL COMPLAINTS COMMITTEE (ICC)

Context:

The tragic self-immolation of a student in Odisha, allegedly after her sexual harassment complaint was dismissed by her college's Internal Complaints Committee (ICC), has triggered nationwide scrutiny.

About Internal Complaints Committee (*ICC*):

- **What is the ICC?**
  - An Internal Complaints Committee (ICC) is a mandatory institutional redressal mechanism created under the Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act, 2013 (POSH Act) to address complaints of sexual harassment at the workplace.
- **Legal Basis & Background:**
  - **Evolved from Vishaka Guidelines (1997)** by the Supreme Court, following the Bhanwari Devi case.
  - Formalised by the **POSH Act, 2013**, post the Nirbhaya case.
  - Made **mandatory** for all workplaces with **more than 10 employees**.
  - For smaller or informal sectors, **Local Complaints Committees** (LCCs) operate at the district level.
- **Objectives of the ICC:**
  - Prevent and redress sexual harassment at the workplace.
  - Create a safe, inclusive, and gender-just work environment.
  - Ensure fair and confidential grievance redressal.
  - Empower women to report violations without fear of reprisal.
- **Key Features and Functions:**
  - **Composition:** Presided over by a senior female employee, at least half the members must be women, and one must be from an NGO or have legal/social expertise.
  - **Jurisdiction:** Can receive complaints within

3 months of the incident and initiate conciliation or inquiry proceedings.
    - **Quasi-judicial Powers:** Can summon witnesses, gather evidence, and recommend disciplinary or legal action.
    - **Timely Inquiry:** Must complete inquiry within **90 days**, and submit recommendations within **10 days** thereafter.
    - **Confidentiality Mandate:** All proceedings, identities, and outcomes are confidential under Section 16 of the Act.
- **Significance of ICCs:**
    - Ensures institutional accountability in safeguarding women's rights.
    - Acts as a deterrent against power abuse and harassment in hierarchal workplaces.
    - Empowers women with a legal and secure grievance forum.
    - Promotes compliance culture and strengthens India's commitment to gender justice.

FIDE WOMEN'S WORLD CUP 2025

Context:

Divya Deshmukh created history by becoming the first Indian woman to win the FIDE Women's Chess World Cup 2025, defeating veteran Koneru Humpy in the final held in Batumi, Georgia.

About FIDE Women's World Cup 2025:

- **What is it?**
    - A prestigious 107-player knockout tournament conducted by the International Chess Federation (FIDE) to determine top contenders for the Women's Candidates Tournament 2026.
- **Venue & Timeline**: Held in Batumi, Georgia, from 5 July to 29 July 2025. It was the third edition of the Women's Chess World Cup.

Tournament Format:

- **Structure**: The event followed a **7-round knockout format**, where players face direct elimination upon losing a match.
- **Seeding Advantage**: The **top 21 ranked players** automatically entered **from Round 2**, giving them a bye in the first round.

- **Match Setup in Each Round**:
    1. **Classical Games** (first 2 days):
        - Two games per match.
        - Each player gets **90 minutes** for the first 40 moves.
        - After move 40: an **extra 30 minutes** is added.
        - From move 1: a **30-second increment** is given for every move.
    2. **If scores are tied after classical games**:
        - **First Tie-breaker**:
            - Two **rapid games** with **15 minutes** + **10-second increment** per move.
        - **Still tied?**
            - Two more **rapid games** with **10 minutes** + **10-second increment**.
        - **Still tied?**
            - Two **blitz games** with **5 minutes** + **3-second increment**.
        - **Still no winner?**
            - Armageddon Game:
                - White gets **3 minutes**; Black gets **2 minutes**.
                - A **2-second increment** starts from move 61.
                - **Black wins in case of a draw**, making it a high-pressure decider.

- **Result:** Divya Deshmukh won **1.5–0.5** in rapid tiebreaks and earns a spot in the Women's Candidates Tournament 2026.
- **Significance:**
  - First Indian to win this title.
  - Becomes India's **88th Grandmaster**, and only **4th Indian woman** GM.
  - Marks a generational shift in Indian chess leadership.

Topics: Distribution of key natural resources across the world (including South Asia and the Indian subcontinent)

MAHISAGAR (MAHI) RIVER

Context:

A section of the Gambhira bridge near Mujpur in Vadodara, Gujarat collapsed on 9 July 2025, causing multiple vehicles to fall into the Mahisagar River, resulting in nine confirmed deaths.

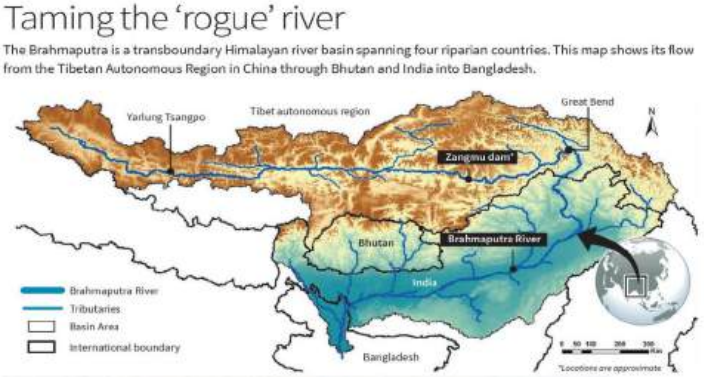
About Mahisagar (Mahi) River:

- **What It Is?**
  - The **Mahisagar or Mahi River** is one of the **few west-flowing rivers in peninsular India**, revered for its cultural and ecological significance.
- **Origin:** Near **Minda village** in **Dhar district**, Madhya Pradesh
  - Approximately **500 meters** above sea level in the **Vindhya Range**
- **States It Flows Through:** Madhya Pradesh, Rajasthan, and Gujarat.
  - **Mouth of the River:**
  - **Empties into:** **Arabian Sea** via the **Gulf of Khambhat.**
  - **Mouth Type:** Wide estuary
- **Length and Drainage Basin:**
  - **Total Length**: 583 km
  - **Total Basin Area**: 34,842 sq. km
- **Major Dams on Mahi River:** Mahi Bajaj Sagar Dam (Rajasthan), Kadana Dam (Gujarat), and Wanakbori Weir.
- **Cities and Districts Along the Course:**
  - Dhar, Ratlam (MP)
  - Banswara (Rajasthan)
  - Mahisagar, Vadodara, Kheda (Gujarat)
- **Uniqueness of the Mahi River:**
  - **West-flowing River:** One of the rare rivers in peninsular India flowing westward into the Arabian Sea.
  - **Intersects the Tropic of Cancer twice** — a rare geographic occurrence unique to Indian rivers.
  - **Cultural relevance:** Referred to as **Mahisagar**, worshipped along its banks with several temples nearby.
  - **Biodiversity hotspot:** Supports turtles, crocodiles, and island ecosystems in dam backwaters.

MEDOG DAM: CHINA'S BRAHMAPUTRA HYDROPOWER PROJECT & CONCERNS

Context:

China approved a 60 GW mega hydropower dam at the Great Bend of the Yarlung Zangbo (Brahmaputra) in the Tibetan Autonomous Region (TAR), raising strategic, ecological, and geopolitical concerns for India, Bhutan, and Bangladesh.



About Medog Dam: China's Brahmaputra Hydropower Project & Concerns:

What is the Medog Dam Project?

- **Location:** Medog County, Tibetan Autonomous Region (TAR), at the **Great Bend** where the Yarlung Zangbo sharply turns south into Arunachal Pradesh and becomes the Brahmaputra.
- **Geographical Context:** The dam lies in a **seismically active, high-rainfall zone** within the Eastern Himalayas, near the **Indo-China border**, impacting both tectonic stability and downstream hydrology.
- **Capacity:** Planned generation of **60,000 MW**, making it the **world's largest hydroelectric project**.
- **Strategic Importance:**
  - Positioned close to **Upper Siang** in

Arunachal Pradesh, a region China claims as "South Tibet," giving the dam significant **geopolitical and hydrological leverage** over India.

Geopolitical Implications:

- **Upstream Dominance:** China's unilateral control over the Brahmaputra upstream alters riparian power asymmetry in its favour.
- **Absence of Legal Safeguards:** None of the four riparian countries are parties to the **UN Watercourses Convention (1997)**—no enforceable rights on water sharing.
- **India–China Tensions:** The dam construction adds a hydro political layer to the ongoing border disputes in Arunachal Pradesh and Ladakh.
- **Dam-building Race:** India has announced its Upper Siang Multipurpose Project, countering China's move, reflecting a reactive strategic posture.

Ecological and Livelihood Concerns:

- **Disruption of Flow:** Storing water to operate the dam will block perennial flows, affecting irrigation, ecology, and sediment transport.
- **Risk to Downstream Communities:** Traditional knowledge fails under unpredictable releases; agro-pastoral economies in Assam and Bangladesh are hit.
- **GLOF and Seismic Risks:** The dam sits in a high seismic zone (site of the 1950 Assam–Tibet earthquake) and is prone to Glacial Lake Outburst Floods (GLOFs).
- **Altered Monsoon Patterns:** Interventions at the source impact groundwater recharge and monsoon-linked flows, crucial for northeastern India's ecology.
- **Biodiversity Threats:** Disruption of aquatic habitats, wetlands, and fish migration routes may endanger species along the basin.

Strategic Alternatives for India:

- **Riparian Diplomacy:** India can assume a leadership role by promoting eco-regional cooperation instead of retaliatory dam-building.
- **Strengthen ELM:** Enhance the Expert Level Mechanism (ELM) with China for real-time data sharing, transparency, and joint assessments.
- **Ecological Leadership:** Promote transboundary river governance frameworks based on sustainability, not infrastructure domination.
- **Disaster Preparedness:** Invest in early warning systems, flood-resilient infrastructure, and community-based adaptation.
- **Regional Coalition:** Build a Brahmaputra River Commission involving Bhutan and Bangladesh for joint monitoring, flood planning, and basin-level conservation.

Conclusion:

The Brahmaputra is not just a river—it is a living ecological and cultural artery of the Himalayas. The Chinese Medog dam may offer megawatts, but it risks drying out the socio-ecological future of millions. A rethinking is needed—from hydro-hegemony to hydrological harmony—to safeguard the Himalayas and its people.

Topics: Important Geophysical phenomena such as earthquakes, Tsunami, Volcanic activity, cyclone etc., geographical features and their location- changes in critical geographical features (including water-bodies and ice-caps) and in flora and fauna and the effects of such changes.

ROLL CLOUD

Context: A rare roll cloud was spotted over Portugal's coastline as a cool Atlantic air mass collided with hot, dry air during an intense European heatwave, captivating beachgoers and meteorologists alike.

About Roll Cloud:

- A **roll cloud** is a rare, low-level, horizontal, tube-shaped cloud that appears to roll as it moves.
- Unlike funnel clouds, it is **not attached to any thunderstorm base** or rotating vortex.
- **Commonly Seen In:**
  - Coastal regions where **oceanic and continental air masses** interact
  - Frequently observed over Plains in the U.S., Gulf of Carpentaria in Australia, and Atlantic coasts of Europe.
- **How Roll Clouds Form?**
  - **Contrasting Air Masses:** Formed due to the interaction of cool, moist maritime air and hot, dry continental air at coastal boundaries.
  - **Thermal Inversion:** A temperature inversion layer develops, with cool air trapped below warm air, restricting vertical convection in the troposphere.
  - **Atmospheric Gravity Waves:** As the dense cool air undercuts warm air, it triggers gravity waves—oscillations in the lower atmosphere.

- **Adiabatic Cooling & Condensation:** The rising limb of the wave cools adiabatically, causing condensation and cloud formation and the sinking limb remains dry.
- **Cloud Structure:** Forms a horizontal, cylindrical cloud detached from main cloud systems—indicating meso-scale dynamics.
- **Geographic Zones:** Common in coastal transition zones where marine-continental boundaries are sharply defined.
- **Alignment & Wind Influence:** Typically aligns parallel to low-level wind flow, often shaped by sea breeze fronts or nocturnal land breezes.

- **Characteristics of Roll Clouds:**
  - **Long, tube-shaped, and low-lying** and can stretch hundreds of kilometers.
  - Detached from the parent cloud system.
  - Often forms in the **morning hours** (also called **"morning glory" clouds**).
  - Appears to **roll horizontally**, like a giant rolling pin in the sky.
- **Impacts and Relevance:**
  - Primarily visual and meteorological phenomena and poses no direct danger.
  - Indicative of instability in the lower atmosphere and temperature gradients.
  - Symbolic of changing weather dynamics and growing climate variability.
  - Can be a precursor to storm development in some regions.

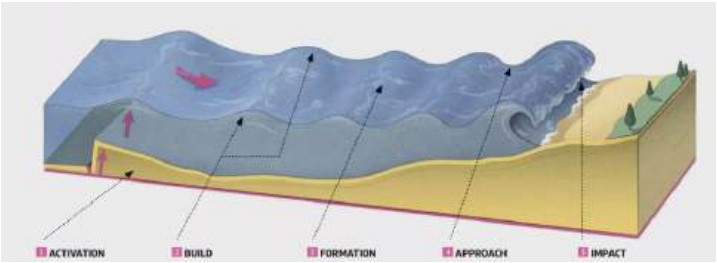
TSUNAMI

Context:

An 8.8 magnitude earthquake struck Russia's Kamchatka Peninsula triggering a tsunami that impacted Russia, Japan, and issued warnings as far as Hawaii and New Zealand.

About Tsunami:

- **What is a Tsunami?**
  - A tsunami is a series of high-energy sea waves caused by sudden large-scale disturbances like earthquakes or volcanic eruptions. These waves travel rapidly across oceans and cause major destruction upon landfall.



- **Tsunami Formation:**
  - **Seafloor Disturbance:**
    - A sudden undersea earthquake, volcanic eruption, or landslide shifts the ocean floor abruptly.
    - This vertical displacement of the seabed pushes up or pulls down large volumes of seawater.
    - It creates a disturbance that initiates tsunami waves spreading outward from the epicentre.
  - **Wave Generation:**
    - The displaced water forms a series of long-wavelength waves that move outward in all directions.
    - In deep ocean, these waves travel extremely fast—up to 800–900 km/h—like a jet plane.
    - Despite high speed, the wave height in deep water is low (30–50 cm), making it barely noticeable.
  - **Drawback Effect:**
    - As the tsunami approaches land, the trough may arrive before the crest, pulling water away from shore.
    - This causes the sea to appear to recede dramatically, exposing seabed and marine life abnormally.
    - Many people misinterpret this as low tide, unaware it precedes a devastating incoming wave
  - **Wave Amplification:**
    - In shallower waters, the tsunami slows down due to friction with the seabed.
    - As the trailing water masses catch up, energy is compressed and wave height rapidly increases.
    - This vertical surge can grow from 1 meter to over 10 meters within minutes, intensifying its force.
  - **Coastal Impact:**
    - The towering wave crashes onto the coast with immense speed and pressure.
    - It inundates up to several kilometres inland, sweeping away people, buildings, trees, and vehicles.
    - Subsequent retreating waves drag debris and survivors back into the sea, worsening destruction.

Characters of Tsunami:

- **Long Wavelength:** Tsunamis have extremely long wavelengths—up to 200 km between successive wave crests.
- **High Energy and Speed (Not Height in Deep Water):** In the open ocean, tsunami waves travel at jet-like speeds (up to 800–900 km/h) but appear only ~30–

50 cm high.

- **Multiple Waves Over Hours:** Tsunamis are not a single wave but a series of waves, often arriving over several hours. The first wave is rarely the largest and later waves can be more destructive.
- **Often Invisible at Sea, Deadly at Shore:** In deep waters, ships barely notice a tsunami due to its low amplitude and wide spacing.

Implications of Tsunamis:

- **Loss of Lives and Health Hazards**: Tsunamis often lead to large-scale fatalities and injuries. For example, the 2004 Indian Ocean tsunami left thousands of dead, with many victims showing signs of drowning and blunt force trauma.
- **Infrastructure Damage:** Critical infrastructure such as ports, coastal homes, bridges, and even nuclear power plants can be destroyed or rendered inoperable, severely affecting the regional economy.
- **Environmental Loss**: Tsunamis devastate ecosystems by inundating croplands with saltwater, destroying coastal habitats, and spreading marine and human debris across vast areas of land and ocean.
- **Disruption of Services**: Basic services such as electricity, clean water supply, road and rail transport, and communication networks often collapse after a tsunami, delaying rescue and rehabilitation.
- **Secondary Hazards**: Tsunamis triggered by earthquakes can also lead to fires, chemical leaks from damaged facilities, and coastal or underwater landslides, compounding the overall destruction.

Tsunami Early Warning Systems

India's System:

- **Seismic Monitoring:** 24/7 seismic stations detect global quakes within 10 minutes, filtering tsunamigenic ones.
- **DART Buoys (BPRs):** Bottom Pressure Recorders detect sea pressure changes from deep-sea waves in real time.
- **Tide Gauges:** Installed along coasts, they verify tsunami waves' actual height and arrival at land.
- **Alert Dissemination:** INCOIS sends alerts to NDMA, media, and public via SMS, sirens, satellite, and radio.

Global Systems:

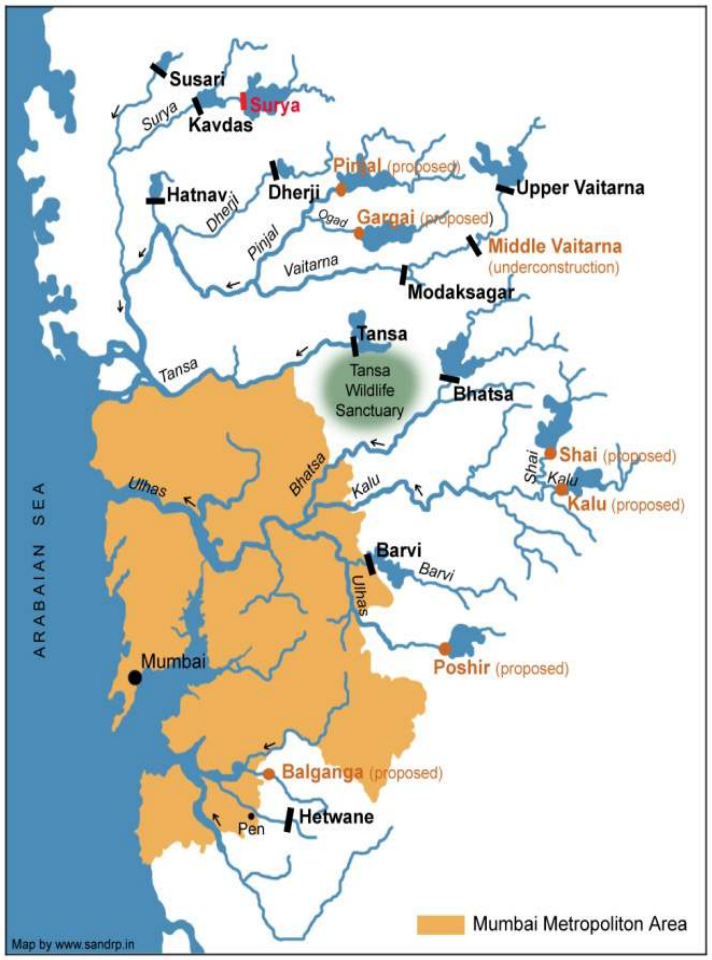
- **IOC-UNESCO Coordination:** Regional warning centres (e.g., PTWC, JMA) coordinate tsunami alerts globally.
- **Global Seismic Networks:** Real-time quake data from thousands of stations help assess tsunami risk.
- **DART and Tide Gauges:** Confirm tsunami formation and arrival, supporting accurate regional alerts.
- **Satellite and Radar:** Radar altimetry and coastal radar detect sea-level anomalies and wave patterns.

Conclusion:

Tsunamis are rare but deadly, demanding constant global vigilance and rapid response systems. India's robust early warning system and international coordination remain critical to minimizing future risks.

KALU RIVER

Context: Over 300 trekkers were rescued in a 7-hour operation near the Kalu River in the Malshej Ghat region, after heavy rainfall caused a sudden rise in river water levels, exposing gaps in safety protocols in eco-tourism zones.



About Kalu River:

- **What is the Kalu River?**
  - The Kalu River is a monsoon-fed river originating in the Kalsubai–Harishchandragad Wildlife Sanctuary, flowing through the Sahyadri ranges and finally draining into the Ulhas River.
- **Origin and Course:**
  - **Source:** Emerges from the Tolar Khind

(Pass) near Harishchandragad Peak, close to Pimpalgaon Joga Dam in Pune district.
    - **Course:** Flows westward, forming Kalu Falls near Savarne–Malshej Ghat and traverses Khireshwar village.
    - **Confluence:** Joined by **Doifodi** at Saralgaon and **Bhatsa River** near Ambivali.
    - **Mouth:** Joins Ulhas River near Atali village. Ulhas then drains into Vasai Bay of the Arabian Sea.
    - **Drainage Basin:** Acts as part of the west-flowing Konkan drainage system.
- **Key Features:**
    - **Geological Transition:** It cascades from the **Deccan Plateau to the Konkan region**, creating dramatic waterfalls like Kalu Falls (1200 ft).
    - **Ecological Zone:** Flows through wildlife-rich forests, including Kalsubai–Harishchandragad Sanctuary, home to leopards, snakes, and endemic flora.
    - **Rainwater Hijacking:** Experts claim the river diverted upper Mula River flows, depriving Ahmednagar and Marathwada of needed rainwater.
    - **Tourist Attraction:** Its scenic beauty draws thousands, but steep terrain, flash floods, and slippery trails make it hazard-prone.
    - **Socio-Hydrological Impact:** Despite high rainfall, Konkan's excess water drains into the sea unused, highlighting the need for water diversion infrastructure.

MOUNT CILO

Context:

Glaciers of Mount Cilo in southeastern Turkey have lost nearly 50% of their ice cover in 40 years, with climate change and heatwaves accelerating melt rates.

About Mount Cilo:

- **Location:**
    - Mount Cilo is the **second-highest peak in Turkey**, rising to **4,135 meters** at its summit Reşko (also called Gelyaşin or Uludoruk).
    - It is situated in the Yüksekova district of **Hakkâri Province**, bordering Iraq, and lies within the East Taurus Mountains (Doğu Toroslar) in Eastern Anatolia.
- **Physical Features:**
    - It spans **30 km in length**, forming the **western arm of the Cilo-Sat Mountains National Park**, declared in 2020.
    - The massif has **rugged topography** with sharp ridges, steep limestone cliffs, deep gorges, and glacial valleys.
    - Nearby is **Suppa Durek (Erinç Tepe)**, Turkey's third-highest peak at 4,116 meters.
- **Glacial Retreat:**
    - The region has seen **rapid glacier loss** due to global warming, with visual signs like ice blocks flowing into streams and receding ice sheets.
    - Experts report **half of the continuous snow and ice cover has vanished** since the 1980s.
    - Melting glaciers now **feed torrents and waterfalls** more intensely, altering water cycles.
- **Climate Extremes:**
    - Turkey has faced rising heatwaves and reduced rainfall.
    - **Silopi**, just 200 km away, recorded **50.5°C** in July 2025 — the **hottest ever in Turkey**.
    - UN projections warn of **30% less rainfall** and **5–6°C temperature rise** by 2100 in the region.

KLYUCHEVSKOY VOLCANO

Context:

The Klyuchevskoy volcano, the tallest active volcano in the Northern Hemisphere, after a massive 8.8 magnitude earthquake struck off Russia's eastern coast.

About Klyuchevskoy Volcano:

- **What is It?**
  - Klyuchevskoy (also known as Klyuchevskaya Sopka) is a **stratovolcano**, known for its **steep conical shape** and intense volcanic activity.
- **Location:**
  - Situated on the **Kamchatka Peninsula**, Russia, about **100 km from the Bering Sea**.
  - Part of the **"Ring of Fire"**, a zone of frequent earthquakes and volcanic eruptions.
- **Key Features:**
  - **Height:** 4,750 meters (15,584 feet) and tallest active volcano in Eurasia.
  - **Eruption Record:** First recorded in **1697** and has remained almost **constantly active** since.
  - **UNESCO Status:** A core part of the **Volcanoes of Kamchatka World Heritage Site**.

About Kamchatka Peninsula:

- **What is It?**
  - A large peninsula in far eastern Russia, between the Sea of Okhotsk (west) and Bering Sea/Pacific Ocean (east).
- **Geographic Features:**
  - Spans 1,200 km north–south and 480 km east–west and **total area:** approx. 370,000 sq. km.
  - Home to 127 volcanoes, of which 29 are active, along with geysers, hot springs, and geothermal fields.
  - Dominated by two major mountain ranges: **Sredinny (Central)** and **Vostochny (Eastern)**.
- **Ecological and Climatic Notes**
  - **Tundra vegetation:** mosses, lichens, and Kamchatka alder.
  - Forested lowlands support birch, larch, poplar, and willow.
  - Harsh sub-Arctic climate with cold snowy winters and cool, wet summers.

GS - 2

FACTS FOR PRELIMS

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

MERI PANCHAYAT APP

Context:

The "Meri Panchayat" app has been awarded the WSIS Prizes 2025 Champion Award in the category of Cultural and Linguistic Diversity at the WSIS+20 High-Level Event in Geneva, recognizing India's innovation in grassroots digital governance.

About Meri Panchayat app:

- **What is It?**
  - **"Meri Panchayat"** is a mobile-based **m-Governance platform** designed to empower rural citizens and Panchayati Raj Institutions (PRIs) by making Panchayat-level data accessible, interactive, and transparent.
- **Developed By:** Jointly developed by the **Ministry of Panchayati Raj** and the **National Informatics Centre (NIC)** under the Ministry of Electronics and IT.
- **Objectives:**
  - Promote **digital inclusion** in rural areas.
  - Enhance **transparency and accountability** in Gram Panchayat operations.
  - Strengthen **participatory democracy** and citizen engagement.
  - Bridge the **knowledge and information divide** at the grassroots.
- **Key Features**
  - **Real-time Information:** Access Panchayat-

level budgets, payments, and development plans.
    - **Civic Engagement:**
        - View Gram Sabha agendas, decisions, and GPDPs (Gram Panchayat Development Plans).
        - Citizens can propose new projects, rate completed works, and submit feedback.
    - **Geo-Features:**
        - Geo-tagging and geo-fencing for projects and grievance redressal.
    - **Multilingual Interface:** Available in 12+ Indian languages to ensure inclusivity.
    - **Weather & Infrastructure Data:** Panchayat-wise weather forecasting, civic assets, and service details.
    - **Social Audit Tools:** Transparency in fund utilization and performance tracking.
- **Award Recognition:**
    - Honoured with the **WSIS Champion Award 2025** in the **"Cultural Diversity and Local Content"** category.
    - Awarded at the WSIS+20 High-Level Event hosted by **ITU, UNESCO, UNDP**, and UNCTAD.
    - Recognized globally as a model of citizen-centric, digital rural governance.

Topics: Parliament and State Legislatures – structure, functioning, conduct of business, powers & privileges and issues arising out of these.

VICE PRESIDENT OF INDIA RESIGNS MID-TERM

Context:

Vice President Jagdeep Dhankhar resigned, citing health reasons, invoking Article 67(a) of the Constitution. He submitted his resignation to President Droupadi Murmu, ending his term prematurely.

About Vice President of India Resigns Mid-Term:

- **What is the Resignation of Vice President?**
    - The Vice President can **voluntarily resign** by submitting a **written letter to the President**, as per **Article 67(a)**.
    - Dhankhar, aged 74, stepped down before completing his **5-year term (2022–2027)**, stating the need to prioritise health.
- **Constitutional Basis for Resignation:**
- **Article 67(a):**
    - Allows the Vice President to resign by writing **under his hand to the President**.
    - No minimum time is prescribed; resignation becomes effective **immediately upon acceptance**.
- **Related Provisions:**
    - **Article 63**: Mandates the office of Vice President.
    - **Article 64**: Vice President serves as **ex-officio Chairman of Rajya Sabha**.
    - **Article 65**: Acts as President during a **casual vacancy or absence**.
    - **Article 68**: Deals with **vacancies** and the need for timely elections if the office falls vacant.
- **Historical Instances of Mid-Term Resignation:**
    - **V.V. Giri (1969):** Resigned to contest the Presidential election.
    - **Bhairon Singh Shekhawat (2007):** Resigned after losing the Presidential race.
    - **Jagdeep Dhankhar (2025):** Resigned for health reasons after chairing the Monsoon Session.
- **Process of Resignation and Vacancy:**
    - **Mode of Resignation:**
        - Must be addressed in writing to the **President of India**.
        - Becomes valid **once submitted**; no formal acceptance process needed.
    - **Filling the Vacancy:**
        - Constitutionally, **no timeline** is fixed for Vice President elections (unlike the six-month rule for President).
        - The **Election Commission** conducts the election by proportional representation among MPs.
- **Term & Re-election Eligibility:**
    - Tenure is **five years**, but the Vice President may:
        - Resign at any time.
        - Continue until successor assumes office.
        - Be re-elected for unlimited terms.

VICE-PRESIDENT OF INDIA - RE-ELECTION PROCESS

Context:

Vice-President Jagdeep Dhankhar resigned from office citing health issues, nearly two years before his term ended.

About Vice-President of India - Re-election Process:

Constitutional Provisions

- **Article 63:** There shall be a **Vice-President of India**.
- **Article 66(1):** Vice-President is elected by **members of an electoral college** consisting of members from both Houses of Parliament (Lok Sabha and Rajya Sabha).
- **Article 68(2):** No fixed deadline for filling a **vacancy caused by resignation**, unlike Presidential elections which have a six-month deadline.

Election Procedure for Vice-President:

- Governed by the **Presidential and Vice-Presidential Elections Act, 1952** and **Election Rules, 1974**.
- Conducted by the **Election Commission of India (ECI)**.

Step-wise Timeline After Notification:

- **Filing of Nominations (14 days):** Candidates are given 14 days from the date of notification to submit their nomination papers. These must be backed by at least 20 proposers and 20 seconders from the electoral college.
- **Scrutiny of Nominations (1 day):** Nomination papers are examined by the Returning Officer to ensure they meet all legal and procedural requirements under the election rules.
- **Withdrawal of Candidatures (2 days):** Candidates who wish to withdraw from the contest can do so within two days after scrutiny, by submitting a written notice of withdrawal.
- **Polling Date (Minimum 15 days after withdrawal):** If an election is necessary, polling must be held at least 15 days after the last date of withdrawal to allow for printing of ballot papers and logistical readiness.
- **Total Minimum Duration:** From the date of notification to polling, the process takes **at least 32 days**, making it difficult to complete before the ongoing parliamentary session ends.

Members of Electoral College:

- Lok Sabha (House of the People) – elected members only.
  - **Lok Sabha** now has **no nominated members** as Constitutional Amendment 104th removed provision for Anglo Indian nominations.
- Rajya Sabha (Council of States) – both elected and nominated members

Note:

- **State Legislative Assemblies do not** participate in the Vice-President's election (unlike Presidential elections).

Voting System:

- Proportional Representation by means of Single Transferable Vote (STV).
- Secret ballot conducted by the Election Commission of India.

Role and Significance of Vice-President:

- Ex-officio Chairman of Rajya Sabha (Article 64)
- Acts as President in case of vacancy (Article 65)
- Key to maintaining parliamentary decorum, facilitating legislative debates, and handling disruptions.
- Plays a non-partisan constitutional role, distinct from the political executive.

LOK SABHA DIGITAL ATTENDANCE

Context:

From the Monsoon Session starting July 21, Lok Sabha MPs will digitally mark attendance from their seats using the new Multimedia Device (MMD) system.

About *Lok Sabha Digital Attendance*:

- **What is the New Attendance System?**
  - The system is a **seat-based digital attendance mechanism** introduced in **Lok Sabha**, enabling Members of Parliament (MPs) to register their presence directly through **biometric or PIN verification** via the **Multimedia Device (MMD)** installed at each seat.
- **Developed By:** Managed and implemented by the **Lok Sabha Secretariat**.
- **How It Works?**
  - **MMD Terminals** at each MP's seat allow attendance marking.
  - MPs can use:
    - **Biometric thumb scan**
    - **PIN-based login**
    - **I-card tap (smart card)**
  - The system integrates with Parliament's internal digital portal that also hosts agenda, documents, and division lists.
- **Key Features:**
  - **Paperless Process:** Eliminates manual attendance registers.
  - **Real-Time Recording:** Tracks and logs attendance instantly.
  - **Time-Saving:** Reduces crowding in lobbies and cuts wait times.
  - **Integrated Terminal:** The same device also accesses agenda papers and session details.
  - **Hybrid Flexibility:** Manual register remains temporarily for transition ease.
- **Significance:**
  - **Improves Parliamentary Efficiency:** Frees up time for actual legislative business.
  - **Boosts Transparency & Accountability:** Helps track MP presence accurately—key for allowance disbursal and public record.
  - **Supports Digital Governance:** Aligns with India's Digital Parliament vision and Good Governance goals.

Topics: Structure, organization and functioning of the Executive and the Judiciary; Ministries and Departments of the Government; pressure groups and formal/informal associations and their role in the Polity.

LEGACY OF RADIO BROADCASTING IN INDIA

Context:

India celebrates National Broadcasting Day to mark the first-ever radio broadcast from the Bombay Station of the Indian Broadcasting Company in 1927.

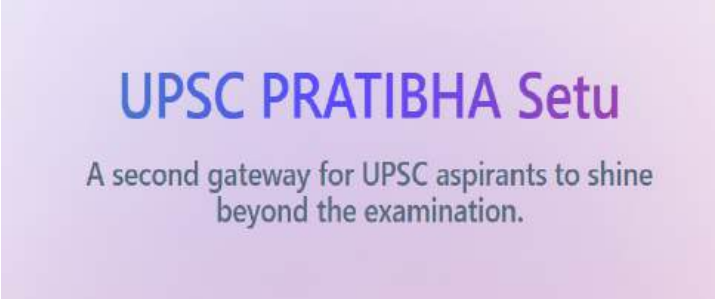
About Legacy of Radio Broadcasting in India:

- **Humble Beginnings: The Birth of Broadcasting**
  - India's radio journey began with **amateur radio clubs** in Calcutta (1923) and Madras (1924), long before state intervention.
  - On **July 23, 1927**, the **Bombay station aired India's first formal broadcast**, under the Indian Broadcasting Company (IBC).
- **Colonial Experiments and Failures:**
  - IBC failed financially and was taken over by the **British government** in 1930 as the **Indian State Broadcasting Service (ISBS)**.
  - In **1936**, ISBS was restructured and renamed **All India Radio (AIR)**, placed under the **Department of Labour and Industries**.
- **Institutional Milestones Post-Independence:**
  - **Akashvani** was formally adopted as the national broadcaster's name in **1956**.
  - **Vividh Bharati** was launched in **1957**, featuring popular entertainment and film music.
  - AIR had just **6 stations in 1947**, covering **2.5% of India's area and 11% of population**.
- **AIR's Role in National Development:**
  - Used for **nation-building**: literacy drives, health campaigns, and agricultural awareness, especially in rural India.
  - Played a key role during **freedom struggle**, countering British propaganda and fostering unity.
  - Supported cultural preservation through **folk music, classical programs**, and **national news services**.
- **External Services & International Outreach:**
  - In **1939**, external broadcasting began in **Pashto and Afghan languages** to counter Axis propaganda.
  - Today, the **External Services Division** airs programs in **11 Indian and 16 foreign languages**, reaching **over 100 countries**.

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

UPSC PRATIBHA SETU

Context: UPSC has renamed its Public Disclosure Scheme (PDS) to UPSC Pratibha Setu and expanded it to allow private employers to recruit qualified but non-recommended candidates from key examinations.



About UPSC Pratibha Setu:

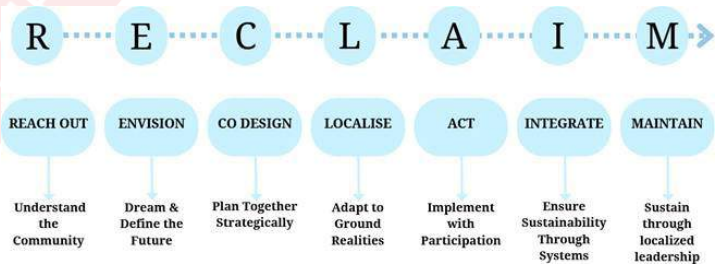
- **What it is?**
  - A **public recruitment linkage platform** that allows employers to access data of candidates who cleared UPSC written exams but were not recommended after interviews.
  - PRATIBHA stands for, Professional Resource And Talent Integration – Bridge for Hiring Aspirants.
- **Launched by:** Union Public Service Commission (UPSC) in 2018, now renamed from PDS to Pratibha Setu in 2024.
- **Objective:** To connect meritorious yet non-selected aspirants with job opportunities across PSUs, autonomous bodies, and private sectors.
- **How It Works?**
  - UPSC provides **details of willing non-recommended candidates** (those who cleared written exams but not final selection).
  - Registered **government, PSU, and private organisations** receive **login credentials** to access the candidate database.
  - Organisations can filter candidates using **subject-wise and discipline-wise** search tools for recruitment purposes.
  - Previously only government bodies could access; now **private employers are also included**, expanding placement scope.
- **Eligible Examinations Covered:**
  - Civil Services Examination, Indian Forest Service Examination, Engineering Services Examination, Indian Economic/Statistical Services, Combined Medical Services Examination, CDS Examination, Central Armed Police Forces (ACs), and Combined Geo-Scientist Examination only
- **Key Features:**
  - **Merit Recognition:** Highlights UPSC-qualified candidates who missed final recommendation.
  - **Public Visibility:** Candidates voluntarily consent to share details with employers.
  - **Digital Platform:** Accessible via UPSC's official portal with secure employer login.
  - **Employment Linkage:** Helps bridge labour market gaps by providing job-matching tools.
  - **Equity in Opportunity:** Ensures skilled candidates are not left out of India's talent pool.

Topics: Government policies and interventions for development in various sectors and issues arising out of their design and implementation.

RECLAIM FRAMEWORK

Context:

The Ministry of Coal will launch RECLAIM Framework, a community engagement framework for mine closure and repurposing.



About RECLAIM Framework:

- **What is RECLAIM?**
  - RECLAIM stands for a structured **Community Engagement and Development Framework** tailored for **mine closure and repurposing**. It is a step-by-step guide for social and ecological transitions in mining regions.
- **Nodal Ministry:** Launched by the **Ministry of Coal** in collaboration with the **Coal Controller Organisation** and the **Heartfulness Institute**.
- **Objective:** To ensure a **just, inclusive, and locally relevant transition** for mining-affected communities, ensuring long-term sustainability and economic recovery post-mining.
- **Key Features of the RECLAIM Framework:**
  - **Structured Community Participation:** Institutionalizes grassroots involvement in

all stages of mine closure and transition.

- **Toolkit and Methodologies:** Offers ready-to-use templates, tools, and **field-tested models** adapted to Indian socio-economic contexts.
- **Gender & Vulnerability Focus:** Ensures **representation of women and marginalized groups**, aligning with SDG principles of equity.
- **Linkage with Local Governance:** Integrates **Panchayati Raj Institutions** to strengthen local accountability and planning.
- **Ecological Restoration Goals:** Focuses on **land reclamation, water table renewal, and afforestation** to restore ecological balance.
- **Socio-economic Continuity:** Promotes **alternate livelihoods, capacity building, and skilling** to reduce dependency on mining.

- **Significance of the Framework:**
  - **First-of-its-kind for India:** Introduces a dedicated, people-centric closure policy in the coal sector.
  - **Boosts Environmental Sustainability:** Supports India's broader **climate adaptation** and **net-zero goals** through ecological regeneration.
  - **Empowers Mining Communities:** Transforms mine closure from an economic setback to an opportunity for **community-led development**.

Topics: Development processes and the development industry- the role of NGOs, SHGs, various groups and associations, donors, charities, institutional and other stakeholders.

NATIONAL COOPERATIVE POLICY – 2025

Context:

Union Home and Cooperation Minister unveiled the National Cooperative Policy – 2025 in New Delhi, aiming to revitalise India's cooperative movement and empower rural, tribal, and marginalized communities through inclusive, tech-driven, and transparent cooperatives.

About National Cooperative Policy – 2025:

- **What is it?**
  - The **National Cooperative Policy 2025** is a forward-looking, result-oriented policy designed to **institutionalise, expand, and modernise** India's cooperative sector as a key pillar of economic growth and social equity.
- **Objective:**
  - To **triple the cooperative sector's share in GDP by 2034.**
  - Ensure **active participation of 50 crore members.**
  - Establish **at least one cooperative in every village.**
  - Enhance transparency, financial sustainability, and digital integration.
  - Empower **rural women, tribals, Dalits, and youth** through cooperatives.
  - Build a **self-reliant and employment-rich cooperative ecosystem** by 2047.
- **Key Features of National Cooperative Policy 2025:**
  - **Inclusive and Village-Centric Focus:**
    - Core emphasis on **villages, agriculture, rural women, Dalits, and tribals.**
    - Aim to create **5 model cooperative villages per tehsil.**
    - PACS to serve as anchors for rural service delivery (e.g., Jan Aushadhi, LPG, Water Schemes).

- **Expansion and Modernisation of Cooperatives:**
  - **30% rise in number of cooperative societies.**
  - **45,000 new PACS** under implementation.
  - New cooperatives to be launched in **taxi, tourism, green energy, and insurance** sectors.
  - Launch of **'Sahkar Taxi' initiative** to ensure driver-centric profit models.
- **Digital Transformation & Transparency:**
  - Computerisation of PACS and adoption of **tech-enabled governance**
  - Cluster-based monitoring and real-time data systems for accountability
  - Legal provisions to be reviewed and updated **every 10 years**
- **Youth and Women Empowerment:**
  - Employment and skilling through **Tribhuvan Sahkari University.**
  - **White Revolution 2.0** to boost dairy and women's cooperative participation.
  - Promotion of **cooperative entrepreneurship** among youth in new sectors.
- **Sectoral Diversification:**
  - Entry into **tourism, logistics, insurance, and green energy** through cooperatives.
  - Establishment of **three multi-state cooperative societies**:
    - National Cooperative Exports Ltd
    - National Seed Cooperative
    - National Organic Products Marketing Cooperative
- **Sustainability and Global Outreach:**
  - Use of **environmental principles** and circular economy in operations.
  - Global access through **National Cooperative Export Limited.**
  - Participation in **International Year of Cooperatives** with grassroots execution.

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

ATAL PENSION YOJANA (APY)

Context:

The Atal Pension Yojana (APY) has crossed 8 crore enrolments as it celebrates its 10th anniversary, with 39 lakh new subscribers added in the current financial year.

About Atal Pension Yojana (*APY*):

Atal Pension Yojana (APY) is a government-backed pension scheme aimed at providing old-age income security to workers in the unorganised sector. It ensures a guaranteed monthly pension post-retirement and is administered by the Pension Fund Regulatory and Development Authority (PFRDA).

Scheme Overview:

- **Launched On**: 9th May 2015
- **Administered By:** PFRDA
- **Target Group:** Workers in the unorganised sector.
- **Nature:** Voluntary and contributory.
- **Pension Range:** ₹1,000 to ₹5,000/month after age 60.
- **Guarantee:** Central Government guarantees the minimum pension.

Objective of APY:

- To build a **universal social security system.**
- To provide **financial stability during old age**.
- To encourage **long-term savings** among informal sector workers.

Eligibility Criteria:

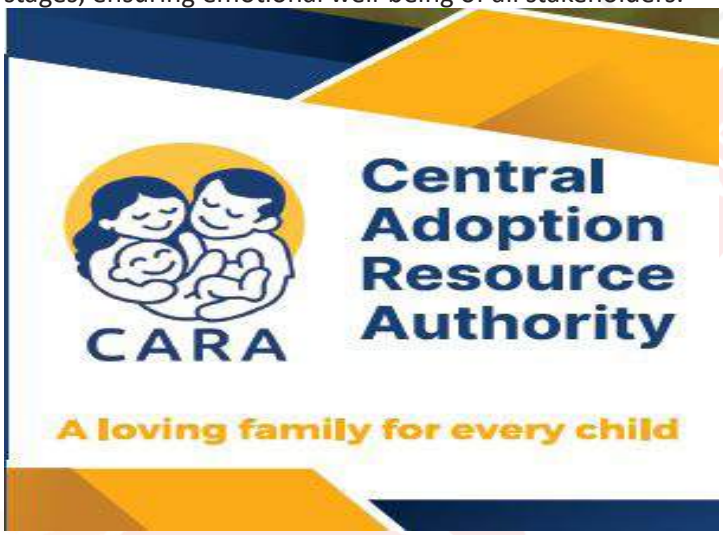
- **Indian citizen**, aged between **18–40 years**.
- Must hold a **savings or post office bank account**.
- Aadhaar and mobile number optional but recommended for updates.
- Government co-contribution only for non-taxpayers and those not under other statutory social security schemes.

Key Features of APY:

- **Guaranteed Minimum Pension:** Assured pension of ₹1,000–₹5,000 based on contribution and entry age.
- **Flexible Contribution Mode:** Contributions can be made **monthly, quarterly, or half-yearly** via **auto-debit** from a savings account.
- **Government Co-Contribution (2015–2020):** GoI contributed **50% of subscriber's input** (up to ₹1,000/ year) for eligible early joiners.
- **Return Assurance:** If actual returns fall short of the guaranteed pension, the **shortfall is covered by GoI**.
- **Spouse and Nominee Benefits:** Pension continues to **spouse after subscriber's death** and corpus is transferred to **nominee** on death of both.
- **Exit Rules:**
  - Full pension starts at **age 60** and early exit allowed with limited refund.
  - In case of death before 60, **spouse can continue or withdraw corpus**.

CENTRAL ADOPTION RESOURCE AUTHORITY (CARA)

Context: The Central Adoption Resource Authority (CARA) has directed State Adoption Resource Agencies to strengthen structured counselling across pre-, during, and post-adoption stages, ensuring emotional well-being of all stakeholders.



About Central Adoption Resource Authority (*CARA*):

- **What it is?**
  - Statutory body under the Ministry of Women & Child Development, Government of India.
- **Established in**: 1990 and became statutory under the Juvenile Justice Act 2015.
- **Headquarters:** New Delhi.
- **Mandate:** Regulates, monitors, and facilitates in-country and inter-country adoption of Indian children.
- **International Role:** Central Authority for inter-country adoption under **Hague Convention on Inter-country Adoption (1993)**, ratified by India in 2003.
- **Objectives of CARA:**
  - Ensure ethical, transparent, and timely adoption processes.
  - Protect the rights of orphaned, abandoned, and surrendered children.
  - Facilitate psychosocial support during all phases of adoption.
- **Key Functions of CARA:**
  - **Regulation & Accreditation:** Monitors registered adoption agencies nationwide.
  - **Digital Oversight:** Manages the **CARINGS portal** for adoption transparency.
  - **Policy Implementation:** Issues binding directions under JJ Act and Adoption Regulations.
  - **Capacity Building:** Trains adoption professionals and empanels qualified counsellors.
  - **Support Framework:** Ensures **counselling services** for biological parents, adoptive parents, and adopted children.

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

EDUCATION MINISTER ISSUED LETTERS OF INTENT (LOIS) TO FOUR FOREIGN UNIVERSITIES

Context:

To mark five years of the National Education Policy (NEP) 2020, the Union Education Minister issued Letters of Intent (LoIs) to four foreign universities for setting up campuses in India.

About Education Minister Issued Letters of Intent (LoIs) To Four Foreign Universities:

- **Issuing Authority:** The Ministry of Education, led by

Dharmendra Pradhan, issued LoIs during the Akhil Bharatiya Shiksha Samagam 2025.

- **Universities Involved:**
  - Western Sydney University – Greater Noida
  - Victoria University – Noida
  - La Trobe University – Bengaluru
  - University of Bristol – Mumbai (from 2026)
- **Programmes Offered:**
  - Degrees in business, AI, logistics, cybersecurity, health, and public policy.
  - Joint Ph.D. academy.
  - 3+1 pathway for UG–PG integration.
- **NEP Alignment:**
  - Supports NEP's goal of internationalisation of Indian higher education.
  - Emphasises multidisciplinary learning, innovation, and global partnerships.

What is a Letter of Intent (LoI)?

- A **Letter of Intent (LoI)** is a formal document that outlines the intention of two parties to enter a partnership or agreement. It precedes a legally binding contract.
- **Key Features:**
  - **Non-binding but directional:** Sets the groundwork for cooperation.
  - **Outlines Scope:** Mentions purpose, timeline, responsibilities, and goals.
  - **Facilitates Negotiations:** Helps avoid ambiguity during formal agreement drafting.
- **Use in Academia:**
  - Demonstrates **institutional commitment**.
  - Serves as a **blueprint for collaboration**, especially for joint research, curriculum sharing, and faculty/student exchange.

CY-TB SKIN TEST

Context:

Kerala has introduced the Cy-TB skin test as a simplified tool for latent tuberculosis infection (LTBI) detection under the National TB Elimination Programme (NTEP).

About Cy-Tb Skin Test:

- **What it is?**
  - **Cy-TB** is a **new-generation intradermal skin test** developed to detect **latent tuberculosis infection (LTBI)** in individuals. Unlike traditional tests like the Mantoux test or IGRA blood test, Cy-TB uses **specific antigens (ESAT-6 and CFP-10)** derived from *Mycobacterium tuberculosis.*
- **Type:** Intradermal skin test to detect *latent TB infection*.
- **Developer:** Introduced under **India's NTEP**, supported by **state TB units and ICMR**.
- **Objective:** Early detection of dormant TB to prevent progression to active disease.
- **Target Group:** Adults (18+), especially those in high-risk or contact groups.
- **How Cy-TB Works?**
  - A **0.1 ml solution** containing *M. tuberculosis-specific antigens* is injected into the skin of the inner forearm.
  - If an **induration (raised swelling)** of ≥5 mm appears in 48–72 hours, it indicates TB infection.
  - Unlike Mantoux or IGRA, **Cy-TB is more specific**, less prone to cross-reaction, and doesn't require blood samples.
  - **Boosted reactions** are also possible in long-latent cases, allowing for reliable follow-up screening.
  - The test **cannot distinguish** between latent infection and active disease but helps identify TB exposure.
- **Key Features of Cy-TB:**
  - **High specificity:** Targets TB-specific antigens, minimizing false positives from BCG or environmental mycobacteria.
  - **Long shelf life:** Multi-dose vials (10 doses) are usable for up to **28 days** under refrigeration.
  - **Simple logistics:** Requires no lab equipment and ideal for peripheral or community-level TB screening.
  - **Fast deployment:** Results can be read on-site in 2–3 days; suitable for mass screening.
  - **Adverse reactions:** Mostly mild (itching, swelling); rare events like ulceration are monitored under active safety review.

MEASLES

Context:

The United States is witnessing its worst measles outbreak since 1992, with over 1,300 cases across 39 states due to falling immunisation rates and vaccine misinformation.

About Measles:

- **What Is Measles?**
  - **Measles is a highly contagious viral disease** caused by the *Measles morbillivirus*, primarily affecting children.
  - Declared eliminated in the US in 2000, it has resurged due to **vaccine hesitancy and misinformation**.
- **Key Symptoms:**
  - **Early Signs:** High fever, persistent cough, runny nose, and conjunctivitis (red eyes).
  - **Characteristic Rash:** Begins on the face and spreads to the rest of the body.
  - **Progression:** Symptoms appear 7–14 days after exposure; contagious 4 days before and after rash onset.
- **Complications of Measles:**
  - Pneumonia and encephalitis (brain swelling) in young children.
  - Long-term issues like deafness, blindness, and loss of immune memory.
  - Increased risk for **malnourished, unvaccinated, or pregnant women**.
  - Can cause premature birth or stillbirth during pregnancy.
- **Measles Spreads:**
  - **Airborne Transmission:** Spreads through coughing, sneezing, and respiratory droplets.
  - The virus remains in the air or on surfaces for up to **2 hours**.
  - **Extremely infectious:** 90% of exposed unvaccinated people get infected.
- **Prevention and Vaccination Strategy:**
  - **MMR Vaccine:** Two doses recommended — at 12–15 months and again at 4–6 years.
  - **Early vaccination** for infants (from 6 months) during outbreaks or international travel.
  - **Herd immunity threshold:** Requires 95% vaccine coverage; current US rate is 92.7%.

KERALA'S KITE INITIATIVE

Context:

Kerala's KITE initiative has gained national and international attention for ethically integrating Artificial Intelligence (AI) in school education, with UNICEF recognising it as a global best practice in responsible EdTech.

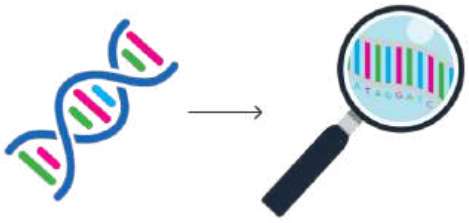
About Kerala's KITE Initiative:

- **What is KITE?**
  - **Kerala Infrastructure and Technology for Education (KITE)** is the technology arm of Kerala's General Education Department. It was established to integrate **digital tools and AI in school education** while ensuring **transparency, inclusion, and teacher autonomy**.
- **Launched by:** Government of Kerala
- **Objective:** To enable **ethical, equitable, and open-source-based** AI integration in public education; to empower teachers and protect student data sovereignty.
- **Key Features of the KITE AI Initiative:**
  - **Mass Teacher Training:** Trained 80,000+ teachers (Classes 8–12) in critical AI use, including bias detection, privacy concerns, and curricular alignment.
  - **Free and Open-Source Software (FOSS):** Adopted across 15,000+ schools, ensuring autonomy, cost-effectiveness, and transparency in AI tools.
  - **Samagra Plus AI Platform:** Kerala's own **RAG-based AI engine** curated by expert teachers; aligns directly with state curriculum to avoid test-prep or bias traps.
  - **Student-Centric Innovation:** Little KITEs IT Clubs train students in robotics and AI through hands-on, contextual learning; praised by **UNICEF as a global best practice**.
  - **Data Sovereignty & Bias-Resistance:** By using in-house infrastructure and open datasets, KITE avoids commercial surveillance models and ensures bias-resistant AI responses.

GUJARAT LAUNCHES INDIA'S FIRST TRIBAL GENOME SEQUENCING PROJECT

Context:

Gujarat became the first Indian state to launch a Tribal Genome Sequencing Project to build a reference genetic database aimed at improving healthcare access for tribal populations.



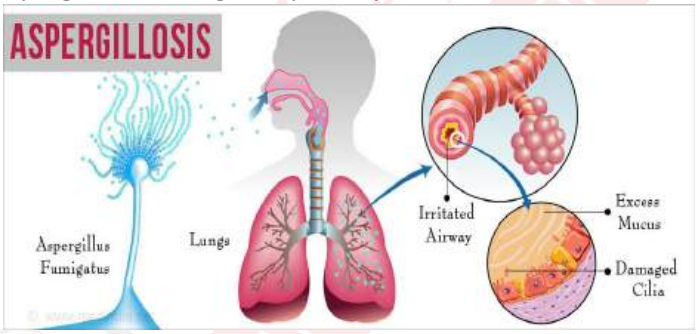
About Gujarat Launches India's First Tribal Genome Sequencing Project:

- **What It Is?**
  - A pioneering genomic research initiative to sequence the genomes of 2,000 tribal individuals across 17 districts of Gujarat to enhance precision medicine.
- **Launched By:** Implemented by the **Gujarat Biotechnology Research Centre (GBRC)**.
- **Objectives:**
  - To identify **genetic risk markers** linked to **inherited disorders** like:
    - Sickle cell anaemia
    - Thalassemia
    - Hereditary cancers
  - To develop personalised healthcare protocols based on tribal genetic profiles.
  - To bridge the health equity gap using science-led tribal empowerment.
- **Key Features:**
  - Involves **advanced infrastructure** for sample collection, sequencing, and data analysis.
  - Focus on **natural immunity markers** and **customised medical care**.
  - Engagement with tribal communities for **inclusive consultation** and awareness.
  - Covers **diverse tribal groups** from **17 districts** to ensure representation and diversity.
- **Significance:**
  - **Healthcare Equity:** Enables early detection and tailored treatment for genetic diseases in underserved communities.
  - **Data-Driven Public Health:** Establishes a baseline genomic database for long-term health research and policy planning.
  - **National Replicability:** Serves as a model for other Indian states to follow in building region-specific genomic policies.

ASPERGILLOSIS

Context:

Pigeons in Indian cities, especially the Blue Rock Pigeon (Columba livia), are being wrongly blamed for rising cases of Aspergillosis, a fungal respiratory infection.



About Aspergillosis:

- **What is Aspergillosis?**
  - A **respiratory infection** caused by inhaling spores from *Aspergillus*, a genus of mold.
  - Most commonly caused by *Aspergillus fumigatus*, which releases airborne spores.
- **Source and Transmission:**
  - **Not contagious** from person to person.
  - Spread occurs through inhalation of spores found in:
    - Soil, compost, dust, rotting vegetation
    - Air ducts, damp walls, bird droppings, old grains
  - Pigeons may contribute indirectly but are not the primary source.
- **Key Features of the Fungus:**
  - Ubiquitous and naturally present in urban and rural environments.
  - Grows best in moist, poorly ventilated, or decaying areas.
  - Spores are microscopic and easily inhaled in large quantities.
- **Symptoms of Aspergillosis:**
  - Persistent cough, chest pain, wheezing.
  - Fever, shortness of breath.
  - Coughing blood in advanced cases (chronic pulmonary aspergillosis).
- **Treatment Options:** Antifungal medications like voriconazole or itraconazole.
  - Surgery in severe or invasive cases.

PHASE 3 TRIALS OF ITS FIRST INDIGENOUS DENGUE VACCINE

Context:

India has enrolled over 8,000 participants in Phase 3 trials of its first indigenous dengue vaccine, developed by Panacea Biotec and supported by ICMR.

About Phase 3 Trials of Its First Indigenous Dengue Vaccine:

- **What Is India's First Dengue Vaccine?**
  - **Name:** *DengiAll* – a **tetravalent dengue vaccine** designed to protect against all four dengue virus serotypes (DENV-1 to DENV-4).
  - **Origin:** Derived from the **TV003/TV005 strain** originally developed by the U.S. National Institutes of Health (NIH) and licensed to Indian firms.
- **Organisations Involved:**
  - **ICMR (Indian Council of Medical Research):** Primary funder and scientific lead.
  - **Panacea Biotec:** Vaccine developer holding process patents and leading formulation trials.
- **How It Works?**
  - **Tetravalent nature:** Offers immunity against all four dengue strains, reducing chances of reinfection.
  - **Live-attenuated virus:** Introduces weakened viruses to safely trigger immune response.
  - **Two-dose vaccine:** Participants receive doses followed by two years of medical follow-up to assess efficacy.
- **Key Features:**
  - **Pan-India Coverage:** Trials being conducted at **20 centres** including Chennai, Pune, Delhi, Hyderabad.
  - **Large-Scale Participation:** Nearly **80% enrolment** completed out of 10,000 targeted candidates.
  - **Process Patented:** Panacea holds proprietary rights over vaccine formulation.
  - **Previous Trial Success:** Phase 1 and 2 completed in 2018–19 with encouraging results.
  - **Clinical Vigilance:** Participants to be monitored for **two years** post-vaccination
- **Significance for India:**
  - **Public Health Impact:** Addresses one of India's most widespread mosquito-borne illnesses.
  - **Child Health Focus:** Offers critical protection for children, who face higher hospitalisation risk.
  - **Reduces Repeat Infections:** Crucial due to low cross-protection between dengue serotypes.

ICMR-NIE - SILENT SALT CONSUMPTION EPIDEMIC

Context:

The ICMR-National Institute of Epidemiology (NIE) has flagged a silent health crisis in India due to excessive salt intake, launching a community-driven intervention in Punjab and Telangana to promote low-sodium alternatives.

About ICMR-NIE - Silent Salt Consumption Epidemic:

- **What Is the "Silent Salt Consumption Epidemic"?**
  - **Definition:** A public health crisis marked by widespread excessive intake of salt, contributing silently to chronic diseases.
  - **Urban-Rural Trend:** Average salt consumption in urban India is **9.2g/day**, and **5.6g/day** in rural areas — both exceeding the WHO's safe limit of **5g/day**.
  - **ICMR Action:** A **three-year project** aims to study salt-**reduction counselling** to lower blood pressure and sodium intake.
  - **Pilot States:** Punjab and Telangana have been selected for targeted interventions among hypertensive individuals.
- **Salt & Its Composition:**
  - **Common Salt (NaCl):** Contains **sodium chloride**, the main culprit behind

hypertension when consumed in excess.
    - **Low-Sodium Substitutes:** Replace part of NaCl with **potassium or magnesium salts**, maintaining flavour while improving health.
    - **Scientific Insight:** A switch to low-sodium salt can reduce blood pressure by an average of **7/4 mmHg**, offering large public health benefits.
- **Key Features of the Salt Epidemic:**
    - **Silent in Nature:** Symptoms appear only after prolonged exposure, making it hard to detect until severe conditions arise.
    - **Culturally Embedded:** High-salt dietary habits are deeply rooted in Indian cooking, snacks, and processed foods.
    - **Underestimated Risk:** Public is largely unaware of daily salt limits and the risks of slow sodium overload.
    - **Healthcare Burden:** Rising incidence of **non-communicable diseases (NCDs)** linked to poor salt consumption awareness.
- **Impacts on India:**
    - **Hypertension Spike:** Excess salt is a leading risk factor behind India's growing hypertension burden.
    - **Cardiovascular Diseases:** Elevated sodium intake directly raises risk of stroke, heart attacks, and arterial stiffness.
    - **Kidney Disorders:** High salt affects renal function, increasing cases of chronic kidney disease.

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

NATIONAL FINANCIAL REPORTING AUTHORITY

Context:

Shri Nitin Gupta (Retd. IRS), former CBDT Chairman, has taken charge as the new Chairperson of the National Financial Reporting Authority (NFRA).

NFRA

सत्यमेव जयते
National Financial Reporting Authority
Government of India

About NFRA (National Financial Reporting Authority):

- **What is NFRA?**
    - NFRA is an independent regulatory authority under the Ministry of Corporate Affairs, tasked with improving transparency, credibility, and quality of financial reporting and auditing in India.
- **Constituted on:** 1st October 2018
- **Established under:** Section 132(1) of the Companies Act, 2013
- **Headquarters:** New Delhi, India
- **Objectives and Mandate:**
    - **Regulate and enforce compliance** with accounting and auditing standards.
    - Recommend policies and standards for corporate financial governance.
    - Monitor the quality of auditing services and suggest improvements.
    - Investigate professional misconduct of auditors in certain classes of companies.
    - Uphold **public and investor interest** by ensuring high-quality financial disclosures.
- **Coverage: Who Comes Under NFRA?**
    - **Listed companies** on Indian or foreign stock exchanges.
    - **Unlisted public companies** meeting any of the following:
        - Paid-up capital ≥ ₹500 crore
        - Turnover ≥ ₹1,000 crore
        - Loans, deposits, debentures ≥ ₹500 crore
    - **Insurance companies, banks, power companies**, and those under special Acts.
    - **Foreign subsidiaries/associates** of Indian companies contributing ≥ 20% of income or net worth.
    - Any entity referred by the **Central Government in public interest**.
- **Features of NFRA:**
    - Statutory autonomy with investigative powers.
    - Can issue directions, debar auditors, and impose penalties.
    - Ensures global alignment with international standards (IFRS, ISA).
    - Promotes corporate governance, investor trust, and audit quality.
    - Strengthens oversight on statutory auditors and financial reporting ecosystem.
- **Significance of NFRA:**
    - Acts as a watchdog for corporate financial discipline.
    - Bridges gaps in audit oversight missed by self-regulatory bodies like ICAI.
    - Enhances investor confidence, especially in large unlisted entities.

THE UNITED STATES HAS ANNOUNCED ITS DECISION TO WITHDRAW FROM UNESCO

Context:
The United States has announced its decision to withdraw from UNESCO by December 2026, citing anti-Israel bias and UNESCO's recognition of Palestine—just two years after rejoining the organization.

About The United States has announced its decision to withdraw from UNESCO:

- **What is UNESCO?**
  - The United Nations Educational, Scientific and Cultural Organization (UNESCO) is a specialized UN agency committed to fostering global peace through education, science, culture, and information exchange.
- **Founded:** November 16, 1945 (Constitution came into force in 1946)
- **Headquarters:** Paris, France
  - Born out of post–World War efforts to rebuild global understanding and collaboration.
- **Key Functions:**
  - **Promote education access and literacy** across member states.
  - **Safeguard world heritage**—both cultural and natural—through its World Heritage Sites.
  - **Foster scientific cooperation** (e.g., tsunami warning systems, biosphere reserves).
  - **Protect intangible heritage** and traditional knowledge (e.g., Nubian Monuments rescue).
  - **Set ethical standards** on digital governance, AI, and genetic research.
  - **Advocate for freedom of expression**, copyright protection, and global knowledge equity.
- **Notable Initiatives:**
  - Man and Biosphere Programme (1971)
  - World Heritage Convention (1972)
  - Convention for Safeguarding Intangible Heritage (2003)
  - Global Education Coalition (2020) during COVID-19
  - Ethics of Artificial Intelligence Recommendation (2021)
- **Strategic Importance:**
  - Helps reduce global inequality in education and culture.
  - Strengthens peacebuilding through intercultural dialogue.
  - Supports disaster preparedness, especially in climate-vulnerable regions.
  - Acts as a **clearinghouse** for scientific and cultural data exchange.

MERA GAON MERI DHAROHAR' (MGMD) INITIATIVE

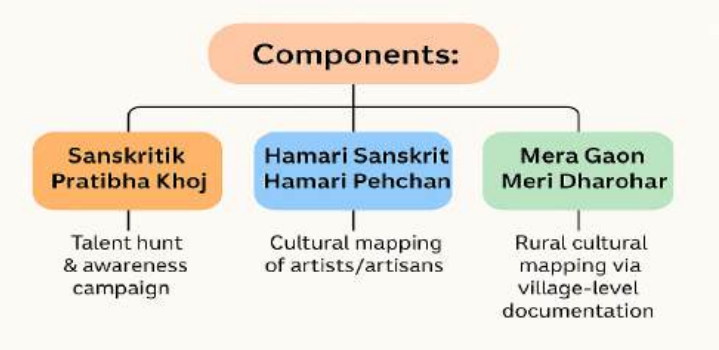
Context:
Over 4.7 lakh villages have been culturally documented under the 'Mera Gaon Meri Dharohar' (MGMD) initiative, as informed by the Ministry of Culture in Parliament.

About Mera Gaon Meri Dharohar (MGMD) Initiative:

- **What it is?**
  - A nationwide cultural mapping project to document the **intangible cultural heritage** of Indian villages.
- **Launched in: June 2023**, under the **Azadi Ka Amrit Mahotsav** celebrations.
- **Aim:** To map, preserve, and digitally archive traditional knowledge systems, rituals, oral traditions, festivals, and local art forms across **6.5 lakh villages**.
- **Features:**
  - Implemented by **IGNCA**.
  - Cultural database of over **4.7 lakh villages** already created.
  - 360° video documentation of **750 villages**.
  - Development of **MGMD Web Portal** as the **National Cultural Workplace (NCWP)**.
  - Part of *National Mission on Cultural Mapping*.
  - User-editable data, artist registrations, UICs, and link to welfare schemes.

About National Mission on Cultural Mapping (*NMCM*):

- **What it is?**
  - A flagship mission to **digitally map India's cultural ecosystem** and empower artist communities.
- **Launched in:** By the **Ministry of Culture**, Government of India.
- **Aim:**
  - Identify and promote **cultural assets**.
  - Create a **national database of artists and art forms**.
  - Foster rural development and **self-reliant village economies** via cultural industries.



- **Key Features:**
  - Creation of **National Digital Inventories**.
  - **Virtual Living Museum**, digital badges, and village travel passports.
  - **Cultural event uploads**, **artist branding**, and ranking via UIC.
  - Integration with **government welfare schemes**.

Topics: India and its neighbourhood- relations.

CHIN REFUGEE

Context: Over 4,000 refugees from Myanmar's Chin State entered Mizoram's Champhai district in July 2025 after violent clashes between Chin rebel groups.

About Chin Refugee:

- **Who are the Chins?**
  - **Ethnic Identity:** The Chins are an ethnic minority primarily from Myanmar's Chin State, culturally and linguistically aligned with the Mizo people of India.
  - **Origin:** They belong to the broader Zo ethnic group, which includes Mizos (India), Bawms (Bangladesh), and Kuki-Zos (Manipur).
  - **Physical & Cultural Traits:** They share Mongoloid features, speak Tibeto-Burman languages, and follow a mix of Christianity and indigenous customs.
  - **Socio-political Links:** Many Chins are involved in anti-junta resistance movements like CNDF and CDF-H in Myanmar.
  - **Places in news regarding Chin migration:** Zokhawthar (Champhai district), Saikhumphai, Vaphai, Farkawn (Champhai South), and Tiau River crossing points.
- **Chin-Mizoram Refugee Dynamics:**
  - **Ethnic Kinship:** Mizoram's majority Mizo population shares deep ethnic and familial bonds with the Chins.
  - **Cross-border Movement:** Free Movement Regime (FMR) permitted traditional mobility but was suspended in 2024 due to rising unrest.
  - **Host State Response:** Mizoram has provided food, shelter, and social support, despite limited central assistance.
  - **Resource Strain:** Villagers and civil bodies now voice concern over resource pressure and illegal trade by refugees.
  - **Legal Measures:** Mizoram seeks Centre's assent for its Household Registers Bill to identify non-citizens amid security fears.

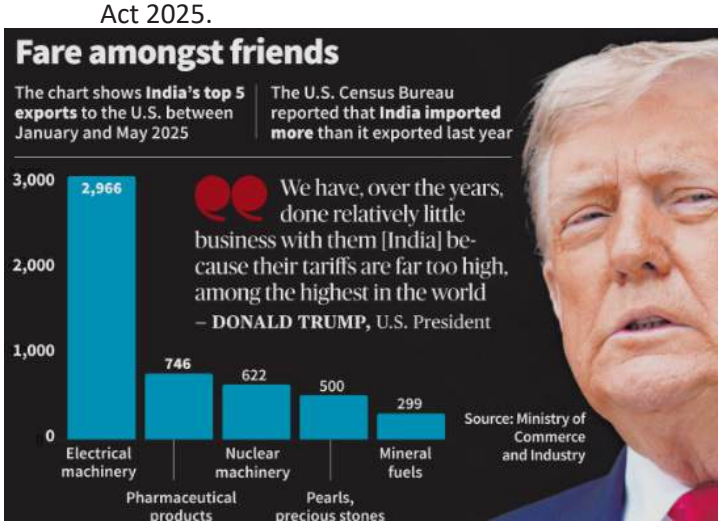
Topics: Bilateral, regional and global groupings and agreements involving India and/or affecting India's interests.

U.S. PRESIDENT ANNOUNCED A 25% TARIFF ON INDIAN IMPORTS

Context:

U.S. President announced a 25% tariff on Indian imports effective August 1, 2025, citing high trade barriers and India's continued energy and defence ties with Russia.

- The announcement includes a Russia-related penalty, linked to the proposed Russian Sanctions Act 2025.



About U.S. President announced a 25% tariff on Indian

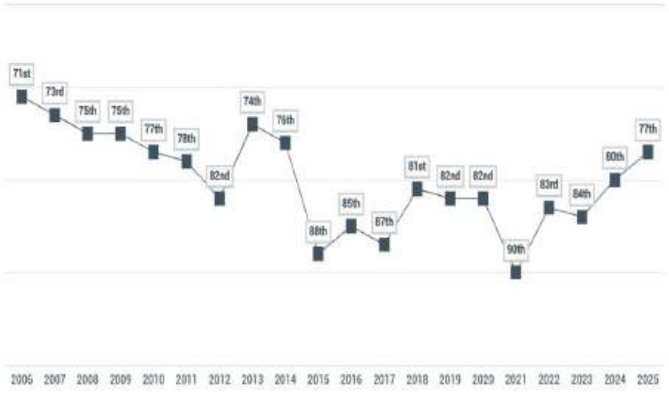
imports:

- **What it is?**
  - A **25% import tariff** on all eligible goods shipped from India to the U.S.
  - Additional **penalty tariffs** for India's continued **oil and defence trade with Russia**.
- **Objective Behind the Tariff:**
  - **Address Trade Imbalance:** To pressure India into reducing its tariffs and removing non-tariff barriers.
  - **Punish Russia-Aligned Trade:** To dissuade India from continuing energy imports from Russia amid Ukraine war sanctions.
  - **Push for Bilateral Deal:** To hasten conclusion of a **"fair and reciprocal"** India–U.S. trade agreement.
- **Key Features of the Announcement**
  - **Trade War Rhetoric:** Trump called India's trade policies "**obnoxious**" and blamed high tariffs and opaque rules.
  - **Linked to Russia Sanctions Act:** The Russia Sanctions Act 2025, under U.S. legislative review, threatens up to 500% duties on nations trading oil with Russia.
  - **Preceded by Negotiation Failure:** The tariff follows the fifth round of failed trade talks between India and the U.S. in Washington.
  - **Past Suspension Now Revoked:** A previously suspended 26% tariff (April 2025) is now being reinstated in a harsher form.
  - **India's Response:** India's **Ministry of Commerce** stated it is reviewing the situation and remains committed to protecting farmers, MSMEs, and entrepreneurs.
    - India cited recent **FTA with the UK** as an example of its fair-trade intent.
- **Significance for India:**
  - **Export Sector Impact:** India's exporters may lose competitiveness in the U.S. market, especially in textile, pharma, and engineering sectors.
  - **Bilateral Strain:** The move could derail progress on the India-U.S. trade agreement, and weaken diplomatic synergy in Quad and Indo-Pacific engagements.
  - **Strategic Autonomy Challenge:** India's multi-alignment policy—especially its Russia ties—faces growing pressure from Western trade-linked coercion.

HENLEY PASSPORT INDEX 2025

Context:

According to the Henley Passport Index 2025, the Indian passport has jumped eight spots, moving from 85th to 77th rank, now offering visa-free access to 59 countries.



About Henley Passport Index 2025:

- **What is it?**
  - The Henley Passport Index is a global mobility ranking that measures the number of destinations a passport holder can access without a prior visa.
  - It is widely used to assess the travel freedom and diplomatic strength of a country.
- **Published by:**
  - The index is compiled by **Henley & Partners**, a global citizenship and residence advisory firm.
  - It is based on **data from the International Air Transport Association (IATA)**, supplemented by in-house research.
- **Criteria Used:**
  - Passports are ranked by the **number of countries accessible without a pre-arranged visa** (including visa-free, visa-on-arrival, or electronic travel authorizations).
  - **227 destinations** are considered in total.
- **Key Global Trends in 2025 Rankings:**
  - **Top Performers:**
    - **Singapore** ranks 1st with visa-free access to **193 countries**.
    - **Japan and South Korea** share 2nd position with access to **190 destinations**.
    - Several **European nations**—Germany, France, Italy—dominate the top 5.
  - **Major Climbers**:
    - **UAE** surged from 42nd to **8th** place in a decade.
    - **China** jumped from 94th to **60th** since 2015.
    - **Saudi Arabia** gained access to **91 destinations**, up by 4 in 2025.
  - **Lowest Rank:** Afghanistan remains at the bottom, offering access to only 25 destinations.
  - **Declining Powers:** USA fell to 10th place; UK

stands at 6th, both losing past top ranks.

- **India's Passport Performance:**
  - **Current Rank:** 77th (up from 85th in 2024).
  - **Visa-Free Access:** 59 countries, including **Malaysia, Maldives, Thailand**.
  - **Visa-on-Arrival:** Offered in Sri Lanka, Myanmar, Indonesia, Macau, etc.
  - **Historical Trend:**
    - **Lowest:** 90th in 2021
    - **Best:** 71st in 2006
  - **Improvement Factors:** Enhanced **bilateral ties**, growing **economic footprint**, and **digital visa facilitation**.

TALISMAN SABRE 2025

Context:

Australia began Talisman Sabre 2025, its largest-ever joint military exercise involving 19 countries and over 35,000 troops, including India.

About *Talisman Sabre 2025*:

- **What is Exercise Talisman Sabre?**
  - Talisman Sabre is a **biennial multinational joint military drill** hosted by Australia in collaboration with the **United States**, aimed at enhancing interoperability and combat readiness among Indo-Pacific allies.
- **Host Nations:** Australia and the United States.
- **Key Sites:** Shoalwater Bay (Queensland), Papua New Guinea (first time), and multiple Defence & non-Defence areas across land, air, sea, space, and cyber domains.
- **Participating Nations:**
  - 19 countries including:
    - **QUAD Members:** India, Japan, USA, Australia
    - **Other Allies**: UK, France, Germany, Indonesia, South Korea, Singapore, Canada, Philippines, New Zealand, Thailand, Norway, Fiji, Netherlands, Tonga, Papua New Guinea
- **Objectives:**
  - **Enhance Multinational Cooperation:** Strengthen coordination among allies and regional security partners.
  - **Test Operational Readiness:** Validate response to complex, large-scale security scenarios.
  - **Project Strategic Deterrence:** Signal military capability and resolve in the Indo-Pacific.
  - **Promote Strategic Balance:** Reinforce collective deterrence amid growing Chinese assertiveness.
- **Key Features of TS25:**
  - **Largest Edition:** Over 35,000 troops, extensive assets, and advanced systems like HIMARS rockets.
  - **First Multinational Deployment in PNG:** Expands beyond Australian territory.
  - **Live Fire Drills:** Realistic combat simulations with blank and live ammunition.
  - **Multidomain Operations:** Involves air combat, maritime patrol, amphibious landings, cyber defence.
  - **Safety & Environment Focus:** Biosecurity checks, marine species protection, and risk management protocols
- **Significance:**
  - **Geostrategic Messaging:** Reinforces Indo-Pacific partnerships against coercive tactics.
  - **India's Role:** Boosts India's defence ties under the QUAD and Indo-Pacific vision.
  - **Regional Trust:** Builds collective confidence and interdependence among democratic allies.

INDIA-SAUDI FERTILIZER AGREEMENT

Context:

Three Indian fertilizer firms have signed a five-year agreement with Saudi Arabia's Ma'aden to import 3.1 million metric tonnes (MMT) of DAP fertilizer annually from 2025–26.

About India-Saudi Fertilizer Agreement:

- **What is the India-Saudi Fertilizer Agreement?**
  - **Nature of Agreement:** Long-term fertilizer import deal to ensure steady DAP supply.
  - **Parties Involved:** Indian firms IPL, KRIBHCO, Coromandel and Saudi firm Ma'aden.
  - **Duration:** 5 years from FY 2025–26, extendable by mutual consent.
- **Key Features of the Agreement:**
  - **Volume Assurance:** Ensures annual supply of **3.1 MMT** of DAP.
  - **Supply Security:** Raises total DAP imports from Saudi Arabia to **30 LMT**, boosting long-term fertilizer stability.
  - **Joint Research Agenda:** Includes collaboration on India-specific alternative fertilizers to improve soil health and crop productivity.
  - **Investment Avenues:** Opens scope for PSU investments in Saudi Arabia, and Saudi investments in Indian agri-input sectors.
  - **Strategic Dialogue:** Bilateral team formed to facilitate policy, research, and investment cooperation in fertilizers and mining.
- **Significance for India:**
  - **Food Security Backbone:** Stable DAP supply will support nutrient-rich farming, key to India's food security.
  - **Import Dependency Management:** Ensures predictable global supply chains amidst geopolitical volatility.
  - **Strengthens Strategic Ties:** Cementing Saudi Arabia as a long-term energy and agri-input partner.
  - **Custom Fertilizer Innovation:** Aims to develop region-specific fertilizers for diverse Indian agro-climatic zones.

SEA SHIP OBSERVER MISSION

Context:

India, along with Japan, the US, and Australia, has launched the first-ever 'QUAD at Sea Ship Observer Mission' under the Wilmington Declaration to boost maritime coordination in the Indo-Pacific.

About Sea Ship Observer Mission:

- **What is it?**
  - A **multilateral maritime cooperation initiative** enabling **observer-level cross-embarkation** of officers from QUAD nations on each other's coast guard vessels.
- **Launched by:**
  - **QUAD Coast Guards** under the ***Wilmington Declaration*** of the QUAD Leaders' Summit (2024)
- **Countries Involved:**
  - **India** – Indian Coast Guard (ICG)
  - **Japan** – Japan Coast Guard (JCG)
  - **United States** – US Coast Guard (USCG)
  - **Australia** – Australian Border Force (ABF)
- **Objectives:**
  - **Strengthen Maritime Interoperability**: Ensure smoother coordination in real-time maritime operations.
  - **Boost Maritime Domain Awareness**: Enhance collective monitoring of Indo-Pacific Sea lanes.
  - **Support Rules-Based Order**: Promote adherence to international maritime law and peaceful dispute resolution.
  - **Promote Gender Inclusion**: Women officers from each nation are included in the mission.
  - **Deepen QUAD Maritime Synergy**: Lay groundwork for a future '**QUAD Coast Guard Handshake**'.
- **Key Features:**
  - **First cross-deployment** of officers among QUAD Coast Guards.
  - Promotes **humanitarian assistance**, **disaster response**, and **capacity-building**.
  - Supports India's strategic maritime outlook via **SAGAR** and the **Indo-Pacific Oceans**

Initiative (IPOI).

- Symbolizes **collective regional preparedness** amid complex maritime threats.

GRAND COLLAR OF THE NATIONAL ORDER OF THE SOUTHERN CROSS

Context:

Brazil has conferred its highest civilian honour — Grand Collar of the National Order of the Southern Cross — on Prime Minister of India during his official visit.

About Grand Collar of the National Order of the Southern Cross:

- **What it is?**
  - Brazil's **highest civilian award**, exclusively given to **foreign dignitaries** for exceptional service to Brazil.
- **Awarded by:**
  - Conferred by the **President of Brazil**, who serves as the **ex officio Grand Master** of the Order.
- **History & Significance:**
  - Founded on **1 December 1822** by **Emperor Pedro I** to commemorate Brazil's **independence and coronation**.
  - Re-established in **1932** by **President Getúlio Vargas** as a **republican order** to honor foreign heads of state and global leaders.
  - Symbolizes **Brazil's diplomatic goodwill**, especially towards Global South partners.
- **About India–Brazil Agreements:**
  - **Defence & Security Cooperation:** Signed a pact to jointly combat terrorism, transnational organized crime, and enhance strategic coordination.
  - **Digital Public Infrastructure:** MoU on exchange of digital solutions, including the adoption of India's UPI-like model in Brazil.
  - **Renewable Energy & Sustainability:** Joint agreement to collaborate in **renewables**, green technology, and energy transition.
  - **Agriculture & Food Security:** MoU between India's ICAR and Brazil's EMBRAPA for agri-tech, seed R&D, and climate-resilient farming.
  - **Intellectual Property (IPR):** Signed MoU between DPIIT (India) and Brazil's Ministry of Trade to strengthen IPR policy exchange and innovation.
  - **Classified Information Exchange:** Framework for **mutual protection** of sensitive information in defence, science, and technology sectors.
  - **Bilateral Trade Monitoring Mechanism:** Institutionalized a ministerial-level mechanism to monitor and boost trade, commerce, and investment flows.

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

ISRAEL BOMBING SYRIA

Context: Israel launched multiple airstrikes on Damascus and Suwayda in Syria, citing the protection of the Druze minority, triggering condemnation from Syria over what it called a "flagrant assault" on its sovereignty.

About Israel Bombing Syria:

What Is the Issue?

- **Israel has intensified military operations** across southern Syria and Damascus amidst violent clashes in **Suwayda**, a Druze-majority region.
- The strikes were triggered by **sectarian clashes** between Druze militias, **Sunni Bedouins**, and **Syrian security forces**.
- Israel claims its strikes aim to protect the **Druze minority** and prevent hostile forces near its borders, especially in the **Golan Heights** region.

Who Are the Druze?

- The **Druze** are an **Arabic-speaking ethno-religious group** with roots in **Shia Islam**, though their beliefs are unique and secretive.

- **Population**:
  - ~1 million globally.
  - Largest populations in **Syria (~50%)**, **Lebanon**, **Israel**, and **Golan Heights**.
- In **Israel**, Druze serve in the military and are considered **loyal citizens**.
- In **Syria**, they historically maintained autonomy through local militias and resisted integration into state forces.

Areas Targeted in Israeli Strikes:

1. Damascus (Central)
2. Suwayda Province (South Syria)

Causes Behind the Israeli Bombing:

- **Druze-Bedouin Clashes:** Began with kidnappings and escalated into a full-fledged battle involving Syrian forces.
- **Syrian Army Action:** Troops intervened and reportedly **targeted Druze civilians**, prompting Israeli response.
- **Israeli Strategic Interests:**
  - Prevent Islamist groups and pro-Iran factions from gaining ground in southern Syria.
  - Create a buffer zone near Golan Heights.
  - Gain influence among Syrian minorities post-Assad regime's fall in 2024.
- **Ceasefire Breakdown:** A brief truce collapsed; fighting resumed, providing Israel further justification.

Geo-Strategic Significance:

- **Suwayda** lies at the **crossroads of Syria, Jordan, and Israel**, making it vital for border security.
- The region's instability threatens **regional peace** and enables **foreign interventions**.

RUSSIA OFFICIALLY RECOGNISED THE TALIBAN

Context:

Russia officially recognised the Taliban-led Islamic Emirate of Afghanistan, becoming the first country to do so formally since the regime's 2021 takeover.

About Russia:

- **Location:** Located in **Northern Eurasia**, spanning both **Eastern Europe** and **Northern Asia**.
  - World's **largest country**, covering approx. 17 million sq. km and stretching across 11 time zones.
- **Capital**: Moscow
- **Neighbouring Countries:**
  - Russia shares borders with **16 nations**, the most of any country:
  - Norway, Finland, Estonia, Latvia, Lithuania, Poland (via Kaliningrad), Belarus, Ukraine, Georgia, Azerbaijan, Kazakhstan, Mongolia, China, North Korea
  - **Maritime Boundaries**: Japan (via Sea of Okhotsk), USA (via Bering Strait)
- **Governance Model:**
  - Russia is a **federal semi-presidential republic**.
  - **President:** Vladimir Putin (Head of State)
  - **Prime Minister:** Mikhail Mishustin (Head of Government)
- **Geological & Physical Features:**
  - **Mountain Ranges:**
    - **Ural Mountains**: Divide Europe and Asia.
    - **Caucasus Mountains**: Home to Mount Elbrus, the highest peak in Europe.
    - **Altai, Sayan, and Kamchatka Ranges** in Siberia.
  - **Rivers & Lakes:**
    - Volga River: Longest river in Europe.
    - **Lena, Yenisei, and Ob Rivers**: Major Siberian rivers draining into the Arctic.
    - **Lake Baikal**: World's deepest and oldest freshwater lake.
    - **Lake Ladoga**: Largest lake in Europe.
  - **Landscapes & Zone:**
    - Includes **tundra, taiga (boreal forest), steppes, and semi-deserts.**
    - Vast **permafrost zones** in Siberia, hindering infrastructure development.

- Rich in **natural resources**: oil, natural gas, metals, and timber.

UAE NOMINATION-BASED GOLDEN VISA SCHEME

Context:

The UAE has introduced a new nomination-based Golden Visa scheme for Indian and Bangladeshi nationals, offering lifetime residency without any property or business investment.

About UAE nomination-based Golden Visa scheme:

- **What is the UAE Golden Visa?**
  - The UAE Golden Visa is a **long-term residency visa** that enables foreign nationals to **live, work, study**, or **run a business** in the UAE without the need for local sponsorship.
- **Objectives:**
  - **Attract global talent** in science, culture, trade, and innovation
  - Boost UAE's position as a **global hub** for skilled professionals and entrepreneurs
  - Strengthen **strategic ties** with countries like India under CEPA
  - Diversify UAE's economy beyond oil by encouraging knowledge-driven growth
- **Key Features of the Golden Visa:**
  - **Lifetime Residency:** No renewal or expiration upon asset sale
  - **One-time Fee:** AED 1,00,000 (Approx. ₹23.3 lakh)
  - **No Investment Needed:** No property or business investment required
  - **Sponsor Family and Staff:** Family members of any age + unlimited domestic staff
  - **No Sponsor Requirement:** Independent of local UAE sponsorship
  - **Uninterrupted Residency:** Can live outside UAE >6 months without losing visa
  - **Multiple-Entry Starter Visa:** 6-month visa for entry to complete formalities
  - **'One Touch' Service:** Streamlined portal for all documentation and renewals
- **What's New for Indians?**
  - Under the new **nomination-based system**:
  - Indians can now qualify **without property or business investment**
  - Selection based on:
    - Professional background
    - Social contributions
    - Potential in science, culture, startups, trade, or finance
  - Pilot phase applies to **India and Bangladesh**.
- **Significance for India-UAE Relations:**
  - Deepens India-UAE **people-to-people ties**, aiding skilled diaspora.
  - Complements **India-UAE CEPA (2022)** with broader mobility and talent exchange.
  - Helps Indian professionals **access UAE markets** more easily.

NATIONAL OVERSEAS SCHOLARSHIP SCHEME

Context:

The Ministry of Social Justice and Empowerment has withheld provisional award letters for 66 out of 106 selected candidates under the National Overseas Scholarship (NOS) due to a shortage of funds.

About National Overseas Scholarship Scheme:

- **What is the National Overseas Scholarship Scheme?**
  - A Central Sector Scheme that enables students from **marginalised communities** to pursue higher education abroad (Master's or Ph.D.) by offering **financial assistance** for tuition, living expenses, and other costs.
- **Launched By:**
  - **Ministry:** Social Justice and Empowerment
  - **Target Groups:**
    - Scheduled Castes (SCs)
    - Denotified, Nomadic & Semi-Nomadic Tribes

- Landless Agricultural Labourers
- Traditional Artisans

- **Objective:**
  - To uplift low-income students from socially and economically disadvantaged groups by helping them access **quality education abroad** and thereby **improve their economic and social mobility.**
- **Eligibility Criteria:**
  - **Academic Qualification**:
    - For Master's – Bachelor's degree with ≥ 60%
    - For Ph.D. – Master's degree with ≥ 60%
  - **Age Limit:** Not more than **35 years** as on April 1 of selection year.
  - **Income Ceiling:** Annual family income should not exceed **₹8 lakh.**
  - **University Requirement:** Unconditional admission in **Top 500 QS-ranked institutions.**
  - **Others:**
    - Not already studying/settled abroad
    - Max **2 children per family** eligible (second only if seats remain)
- **Key Features:**
  - **Annual Slots:** 125 scholarships per year (115 for SCs, 6 for De-notified Tribes, 4 for Labourers/Artisans).
  - **Gender Quota:** 30% of total awards reserved for women candidates.
  - **Two-Phase Selection:**
    - **First round**: QS Top 500 admission required.
    - **Second round**: Broader eligibility including QS-ranked and other recognised institutions.
  - **Cap per State:** No more than 10% of total slots per state to ensure wider geographic distribution.
  - **Conditional Awarding:** If funds fall short, only part of selected candidates may receive awards.

Topics: Important International institutions, agencies and fora, their structure, mandate.

EXERCISE BOLD KURUKSHETRA 2025

Context: The 14th edition of Exercise Bold Kurukshetra 2025 between India and Singapore began in Jodhpur, focusing on mechanised warfare and UN peacekeeping scenarios, further boosting bilateral defence ties.

About Exercise Bold Kurukshetra 2025:

- **What Is It?**
  - A **bilateral military exercise** between the **Indian Army and the Singapore Armed Forces**, aimed at enhancing operational coordination, particularly under **United Nations mandates**.
- **Participating Nations:**
  - **India:** Mechanised Infantry Regiment
  - **Singapore:** 42nd Armoured Regiment, 4th Singapore Armoured Brigade
- **Key Features:**
  - **Format & Focus:** Conducted as a tabletop exercise and computer-based wargame to validate joint operational tactics in mechanised warfare.
  - **UN Mandate Simulation:** Emphasizes joint coordination during UN peacekeeping operations, enhancing combat readiness in multinational missions.
  - **Symbolic Handover:** Includes ceremonial regimental flag transfer to represent operational synergy and shared command spirit.
  - **Indian Army Showcase:** Culminates in a military equipment display, highlighting India's technological prowess and defence preparedness.
  - **Interoperability Training:** Reinforces tactical and strategic-level collaboration, improving joint mission execution capacity.
- **Strategic Significance**
  - **Strengthens Indo-Pacific Security:** Reinforces India's strategic partnership with Singapore in a region marked by evolving security challenges.
  - **Boosts Defence Diplomacy:** Serves as a model of military-to-military engagement, showcasing India's commitment to regional stability.
  - **Capacity Building:** Enhances both armies' ability to operate jointly in multinational coalitions, especially under UN-led scenarios.

THE UNITED STATES HAS ANNOUNCED ITS DECISION TO WITHDRAW FROM UNESCO

Context:

The United States has announced its decision to withdraw from UNESCO by December 2026, citing anti-Israel bias and UNESCO's recognition of Palestine—just two years after rejoining the organization.

About The United States has announced its decision to withdraw from UNESCO:

- **What is UNESCO?**
  - The United Nations Educational, Scientific and Cultural Organization (UNESCO) is a specialized UN agency committed to fostering global peace through education, science, culture, and information exchange.
- **Founded:** November 16, 1945 (Constitution came into force in 1946)
- **Headquarters:** Paris, France
  - Born out of post–World War efforts to rebuild global understanding and collaboration.
- **Key Functions:**
  - **Promote education access and literacy** across member states.
  - **Safeguard world heritage**—both cultural and natural—through its World Heritage Sites.
  - **Foster scientific cooperation** (e.g., tsunami warning systems, biosphere reserves).
  - **Protect intangible heritage** and traditional knowledge (e.g., Nubian Monuments rescue).
  - **Set ethical standards** on digital governance, AI, and genetic research.
  - **Advocate for freedom of expression**, copyright protection, and global knowledge equity.
- **Notable Initiatives:**
  - Man and Biosphere Programme (1971)
  - World Heritage Convention (1972)
  - Convention for Safeguarding Intangible Heritage (2003)
  - Global Education Coalition (2020) during COVID-19
  - Ethics of Artificial Intelligence Recommendation (2021)
- **Strategic Importance:**
  - Helps reduce global inequality in education and culture.
  - Strengthens peacebuilding through intercultural dialogue.
  - Supports disaster preparedness, especially in climate-vulnerable regions.
  - Acts as a **clearinghouse** for scientific and cultural data exchange.

GROUP OF FRIENDS (GOF) FOR ACCOUNTABILITY OF CRIMES AGAINST PEACEKEEPERS

Context:

India reiterated its strong commitment to ensuring justice for crimes against UN peacekeepers at a high-level meeting of the Group of Friends (GoF) at the UN Headquarters, calling accountability a strategic necessity.

About Group of Friends (GoF) for Accountability of Crimes against Peacekeepers:

- **What it is?**
  - An informal platform of UN member states committed to advancing justice for crimes against UN peacekeepers and strengthening global peacekeeping norms.
- **Launched In:** December 2022, during India's Presidency of the UN Security Council.
- **Membership:** Includes around 40 UN member states, co-chaired by India and like-minded countries from Asia, Africa, and Latin America.
- **Objectives:**
  - Promote legal and policy frameworks to prosecute crimes against peacekeepers.
  - Ensure deterrence by addressing impunity.
  - Uphold credibility and integrity of UN

Peacekeeping Operations.

- **Key Functions:**
  - Facilitate dialogue among states, UN bodies, and experts.
  - Support investigation mechanisms and legal reforms.
  - Track implementation of **UNSC Resolution 2589 (2021)** which mandates accountability for attacks on peacekeepers.
  - Advocate for reports from the UN Secretary-General on progress made.
- **Significance:**
  - Vital for the safety of UN peacekeepers in high-risk missions.
  - Reinforces trust in multilateralism and India's leadership in peacekeeping.
  - Aligns with India's legacy of contributing over **300,000 peacekeepers**, the highest by any country.
  - Safeguards operational morale and legal protections for personnel from Global South countries.
- **Outcomes of the July 2025 High-Level Meeting:**
  - **Strategic Framing of Accountability:** India called accountability a *strategic necessity*, not just a legal duty—essential for peacekeeper safety and mission success.
  - **Combatting Impunity:** The GoF reaffirmed that lack of punishment fuels more attacks on peacekeepers, undermining global peace efforts.
  - **India's Role Reaffirmed:** India showcased its historical leadership with 182 peacekeeper martyrs and pledged continued legal, diplomatic, and moral support to the cause.

WHO 3 BY 35 INITIATIVE

Context: The World Health Organization (WHO) has launched the 3 by 35 Initiative, aiming to reduce harmful product consumption and generate sustainable public revenue through targeted health taxes.

About *WHO* 3 by 35 Initiative:

- **What It Is?**
  - A global initiative to increase the real prices of tobacco, alcohol, and sugary drinks by **at least 50% by 2035** through higher taxes.
- **Launched By:** The **World Health Organization (WHO)**, in collaboration with global development partners, civil society, and governments.
- **Objective:** To reduce consumption of harmful products, improve public health, and **mobilize US$ 1 trillion in additional public revenue** by 2035, thereby supporting the Sustainable Development Goals (SDGs).
- **Key Features:**
  - **Tax-Based Strategy:** Raise taxes to increase prices of tobacco, alcohol, and sugary drinks by at least 50%.
  - **Country-Specific Approach:** Policies tailored to national contexts with technical, legal, and administrative support.
  - **Three Pillars of Action:**
    - **Mobilizing Countries:** Engaging political leaders and ministries to drive action.
    - **Supporting Policies:** Providing technical assistance for evidence-based, effective health taxes.
    - **Building Partnerships:** Strengthening civil society roles and fostering global collaboration.
  - **Expected Impact:**
    - Generate **up to US$ 3.7 trillion** in revenue within 5 years.
    - Save millions of lives by curbing noncommunicable diseases (NCDs).
    - Reduce reliance on foreign aid through **sustainable domestic financing**.
- **Significance:**
  - **Public Health Impact:** Tackles leading NCDs by reducing harmful consumption habits.
  - **Economic Benefit:** Strengthens domestic resource mobilization amid fiscal challenges.
  - **Global Development:** Supports countries in achieving health and financing targets under the SDGs.
  - **Equity and Sustainability:** Promotes long-term, equitable health financing mechanisms.

17TH BRICS SUMMIT

Context:

India's Prime Minister of India participated in the 17th BRICS

Summit in Brazil, where Indonesia was welcomed as a full BRICS member.

- The summit also saw adoption of the Rio de Janeiro Declaration focused on global governance reforms and sustainable development.

About 17th BRICS Summit:

- **What is BRICS?**
  - **BRICS** is an intergovernmental forum of emerging economies initially comprising **Brazil, Russia, India, China, and South Africa**.
  - The term **"BRIC"** was coined in 2001 by economist **Jim O'Neill** to represent fast-growing economies. South Africa joined in 2010, making it **BRICS**.
- **Establishment and Evolution:**
  - **Formed in 2009** (1st summit in Yekaterinburg, Russia).
  - Evolved from informal dialogue to structured cooperation platform.
  - Expanded in **2024–25**, now known as **BRICS+** or **Expanded BRICS**.
- **Objectives:**
  - Promote **multipolarity and global South cooperation**.
  - Reform international institutions like **UNSC**, **IMF**, and **World Bank**.
  - Enhance **economic, technological, and development** collaboration.
  - Counterbalance dominance of Western-led institutions like the **G7**.
- **Members:**
  - **Original 5:** Brazil, Russia, India, China, South Africa
  - **New Members:** Egypt, Ethiopia, Iran, UAE, Indonesia (joined in 2025)
- The leaders also expressed full support for **India's BRICS Chair ship in 2026** and the holding of the 18th BRICS Summit in India.

About *Rio de Janeiro Declaration*:

- **Global Governance Reform:**
  - Called for **urgent reforms** in UNSC, IMF, WTO to reflect **21st-century realities**.
  - Emphasized voice and participation of **Global South** in international forums.
- **Peace and Security:**
  - Condemned **terrorism**, specifically the **Pahalgam attack** in India.
  - Demanded strong global action against **terror sponsors** and zero tolerance for terror.
- **Technology & AI:**
  - Advocated for **responsible AI governance** with balance between regulation and innovation.
  - Proposed a **BRICS Science & Research Repository** for Global South access.
- **Economic & Financial Affairs:**
  - Emphasized **sustainable funding** through NDB on demand-driven principles.
  - Stressed building **resilient supply chains** for **critical minerals**.
- **Inclusion of Indonesia:**
  - Indonesia became **the first Southeast Asian nation** to join BRICS, deepening Asia-Africa-Latin America ties.

GENERAL STUDIES -3

FACTS FOR PRELIMS

Topics: Indian Economy: growth and development

PM VIKSIT BHARAT ROZGAR YOJANA (PM-VBRY)

Context:

The PM Viksit Bharat Rozgar Yojana (PM-VBRY) will come into effect from 1st August 2025 to incentivize large-scale job creation, replacing the Employment Linked Incentive (ELI) Scheme.

About PM Viksit Bharat Rozgar Yojana (*PM-VBRY*):

- **What it is?**
  - A **national employment-linked incentive scheme** to promote **job creation** in formal sectors, especially **manufacturing**, as part of the **Viksit Bharat initiative**.
- **Launch Date:** Effective from **1st August 2025**
- **Administered By:** Ministry of Labour and Employment
- **Total Outlay:** ₹99,446 crore
- **Implementation Period:** 2025–2027
- **Target:** Over **3.5 crore new jobs**, including **1.92 crore first-time workers**
- **Objective:**
  - To promote **inclusive and sustainable job creation**.
  - To incentivize employers for hiring new workers, especially in **manufacturing**.
  - To support **first-time employees** entering the formal workforce
- **Key Features of PM-VBRY:**
  - **Part A: Incentive for First-Time Employees**
    - **Eligibility:** New EPFO-registered employees with monthly salaries up to ₹1 lakh.
    - **Incentive:** One-month EPF wage (up to ₹15,000), paid in **two instalments**:
      - **1st instalment:** After 6 months of service
      - **2nd instalment:** After 12 months and completion of financial literacy training
    - **Saving Habit Promotion**: Part of the incentive will be **locked in a deposit account** for future withdrawal.
  - **Part B: Incentive for Employers**
    - **Focus Sector:** All sectors, with **special focus on manufacturing**
    - **Employer Eligibility:** EPFO-registered entities hiring:
      - **2 or more** additional employees (if existing staff <50)
      - **5 or more** (if staff ≥50)
    - **Wage-based Incentive (per employee per month):**
      - ₹1,000 for wages ≤ ₹10,000
      - ₹2,000 for ₹10,001–₹20,000
      - ₹3,000 for ₹20,001–₹1,00,000
    - **Tenure:** 2 years for all sectors; extended to **4 years for manufacturing**
- **Payment Mechanism:**
  - **First-Time Employees:** Paid via DBT using Aadhar Bridge Payment System (ABPS).
  - **Employers:** Direct payment to PAN-linked bank accounts.

ADEETIE SCHEME

Context:

Union Minister launched the ADEETIE scheme to boost industrial energy efficiency, especially for MSMEs, at a national rollout event in Panipat, Haryana.

About ADEETIE scheme:

- **What is ADEETIE?**
  - **ADEETIE** stands for **Assistance in Deploying Energy Efficient Technologies in Industries & Establishments**.
  - It is a flagship scheme to promote low-carbon industrial growth by facilitating adoption of clean, efficient energy technologies.
- **Launched by:** Union Ministry of Power
- **Implemented by:** The Bureau of Energy Efficiency (BEE)
- **Budget & Duration:**
  - **Total Budget:** ₹1000 crore (FY 2025–26 to FY 2027–28).
  - ₹875 crore for interest subvention, ₹50 crore for audits, ₹75 crore for handholding support.
- **Core Objectives:**
  - Promote **energy efficiency (EE)** in MSMEs to reduce emissions.
  - Provide **financial assistance and technical support** for technology adoption.
  - Improve power-productivity ratio and support India's **net zero and Viksit Bharat goals.**
- **Key Features:**
  - **Interest Subvention:**
    - 5% for Micro and Small Enterprises
    - 3% for Medium Enterprises
  - **Technical Handholding:**
    - Investment-grade energy audits (IGEA)
    - DPR preparation and tech implementation
    - Monitoring & verification (M&V) post-installation
  - **Digital Facilitation:** Dedicated portal to track applications and disbursements.
  - **Cluster-Based Rollout:**
    - Phase I: 60 industrial clusters
    - Phase II: 100 additional clusters
  - **Expected Outcomes:**
    - Up to **50% reduction in energy usage** in some technologies.
    - ₹9000 crore investments catalysed, including ₹6750 crore in MSME loans.
- **Eligibility Criteria:**
  - Registered **MSMEs** in identified clusters/ sectors.
  - Active participation in energy audits and DPR approval process.
  - Preference to early adopters and energy-intensive industries.

EMPLOYMENT LINKED INCENTIVE (ELI) SCHEME

Context:

The Union Cabinet approved the Employment Linked Incentive (ELI) Scheme, aiming to create over 3.5 crore jobs and boost formal employment across sectors, especially manufacturing.

About Employment Linked Incentive (ELI) Scheme:

The Employment Linked Incentive (ELI) Scheme is a government initiative launched to promote large-scale formal job creation across all sectors, especially manufacturing.

- **Ministry:** Ministry of Labour and Employment
- **Type:** Direct Incentive Scheme to boost employment
- **Launched Under:** Union Budget 2024–25's youth skilling and employment package
- **Outlay:** ₹99,446 crore for 2 years
- **Timeline:** Covers jobs created between **Aug 1, 2025 – July 31, 2027**

Key Features of the ELI Scheme

- **Part A – For First-Time Employees**
  - **Incentive Amount:** One month's EPF wage (up to ₹15,000) in two instalments.
  - **Eligibility:** First-time salaried employees (up to ₹1 lakh salary), registered with EPFO.
  - **Conditions:**
    - 1st instalment after 6 months of continuous service.
    - 2nd instalment after 12 months + financial literacy course.
  - **Savings Link:** A portion of incentive to be held in a deposit account to promote saving habits.
  - **Expected Beneficiaries:** ~1.92 crore workers.
- **Part B – For Employers**
  - **Focus:** All sectors, with extended support for manufacturing sector.
  - **Incentives:** ₹1,000–₹3,000/month per new employee for 2 years.
  - **Extended Benefit:** For manufacturing sector, incentives extended up to 4 years.
  - **Eligibility:**
    - EPFO-registered firms hiring 2+ employees (if <50) or 5+ (if ≥50).
    - New hires must remain employed for at least 6 months.

EPF Wage Slab	Incentive to Employer
Up to ₹10,000	Up to ₹1,000
₹10,000 – ₹20,000	₹2,000
₹20,000 – ₹1,00,000	₹3,000

Payment Mode:

- **Employees:** Via **DBT using Aadhaar-based ABPS**
- **Employers:** Directly into **PAN-linked accounts**

- **Significance of the Scheme:**
- **Job Creation Catalyst:** Targets **3.5 crore+ jobs**, especially for first-time formal workforce entrants.
- **Workforce Formalization:** Expands **social security coverage** through EPFO.
- **Boost to Manufacturing:** Long-term incentives to revive and expand labour-intensive sectors.
- **Promotes Savings:** Structured wage-based savings incentive for youth.

Topics: Poverty and Unemployment

PMKVY (PRADHAN MANTRI KAUSHAL VIKAS YOJANA)

Context:
India celebrates 10 years of Pradhan Mantri Kaushal Vikas Yojana (PMKVY), with over 1.63 crore youth trained under the scheme.

About PMKVY (Pradhan Mantri Kaushal Vikas Yojana):

- **What is PMKVY?**
  - PMKVY is a **flagship skill development scheme** of the Government of India to train youth in **industry-relevant job skills** and improve their employability.
- **Launched By:** Ministry of Skill Development and Entrepreneurship (MSDE)
- First launched in **2015** under the **Skill India Mission (SIM)**
- **Core Objective:** To **bridge the skill gap** between youth capabilities and industry demands by providing short-term training, recognition of prior skills, and placement support.
- **Key Features:**
  - **Short-Term Training (STT):** Offers 3–6-month training to fresh entrants across 30+ sectors.
  - **Recognition of Prior Learning (RPL):** Certifies informal workers like artisans, weavers, and craftsmen, validating their existing skills.
  - **Digital Integration:** PMKVY 4.0 integrates AI-based analytics, Academic Bank of Credits, and a unified **Skill India Digital Hub**.
  - **Inclusivity Focus:** Nearly **45% of trained beneficiaries are women**, with strong representation from SC, ST, and OBC communities.
  - **Global & Emerging Skills:** Training extended to areas like **AI, IoT, mechatronics, drones**, along with support for **traditional crafts**.
  - **Skill Hub Initiative & COVID Warriors Training:** Integrated vocational training in schools and trained 1.2 lakh youth for COVID-related roles.

Achievements of PMKVY in 10 Years:

- **1.63 crore youth trained** under PMKVY (as of July 2025)
- **Over 6 crores** trained under all MSDE skilling schemes since 2014
- **25+ lakh trained under PMKVY 4.0** (FY 2022–2025)
- **1.10 crore trained under PMKVY 2.0**, linked with Make in India & Digital India
- **17 lakhs trained** under DDU-GKY and **56 lakhs under RSETIs** (entrepreneurship focus)

BACKDOOR LAYOFFS

Context:
Google has initiated a Voluntary Exit Programme (VEP) and

new hybrid work mandates, sparking debate over 'backdoor layoffs' amid ongoing workforce restructuring across global tech giants.

About Backdoor Layoffs**:**

- **Definition:** Backdoor layoffs are indirect methods used by companies to reduce workforce without formal termination notices, often avoiding regulatory scrutiny and public backlash.
- **How Do Backdoor Layoffs Work?**
  - **Voluntary Exit Programmes (VEP):** Employees are offered **severance pay** to resign voluntarily. This helps companies reduce headcount without official layoffs. **E.g.** Google's VEP for Core Systems and Marketing teams.
  - **Enforcing Unfavourable Work Conditions:** Forcing **remote workers to shift to hybrid schedules** may lead to resignations, effectively reducing staff without declaring layoffs.
  - **Strategic Role Dissolution:** Dissolving certain teams (e.g., Knowledge, AR, Voice Assistant) indirectly compels exits.
- **Key Characteristics of Backdoor Layoffs:**
  - **Disguised Downsizing:** Avoids public backlash and Workers Adjustment & Retraining Notification (WARN) Act compliance in the U.S.
  - **Legally Safer:** Less likely to face litigation as employees technically resign.
  - **Reduces Severance Burden:** Avoids large-scale severance costs tied to involuntary layoffs.
  - **Preceded by Policy Changes:** Often introduced along with **new rules** (e.g., return-to-office mandates) to prompt resignations.

SCHEME FOR PROMOTION OF REGISTRATION OF EMPLOYERS AND EMPLOYEES (SPREE) 2025

Context:

The Employees' State Insurance Corporation (ESIC) has launched SPREE 2025 to expand social security coverage.

- The scheme offers a one-time opportunity for employers and workers to register under ESI without facing penalties or retrospective inspections.

About Scheme for Promotion of Registration of Employers and Employees **(*SPREE) 2025*:**

- **What is SPREE?**
  - A special scheme to bring unregistered employers and employees—especially **contractual and temporary workers**—under the **ESI social security net**.
- **Launched by:** Employees' State Insurance Corporation (ESIC)
- **Ministry:** Ministry of Labour and Employment
- **Objective:** To **formalize employment** by facilitating **voluntary compliance** and expanding ESI coverage to informal workers.
- **Key Features of SPREE 2025:**
  - **Digital Registration:** Registration via ESIC portal, Shram Suvidha portal, and MCA portal.
  - **No Retrospective Penalty:** No contribution, inspection, or legal demand for the pre-registration period.
  - **Declared Validity:** Registration valid from the date declared by the employer.
  - **No Legal Hurdles:** Removes fear of litigation for past non-compliance.
  - **Boost to Informal Sector:** Brings temporary, contractual, and unorganised workers under formal coverage.
  - **One-Time Amnesty:** Encourages large-scale participation without penal action.
- **Significance:**
  - **Promotes Labour Formalisation**: Encourages employers to integrate informal workers into the formal workforce.
  - **Welfare Expansion**: Expands access to **ESI health and social benefits**.

Topics: Indian Financial Money Market

THE BANKING LAWS (AMENDMENT) ACT, 2025

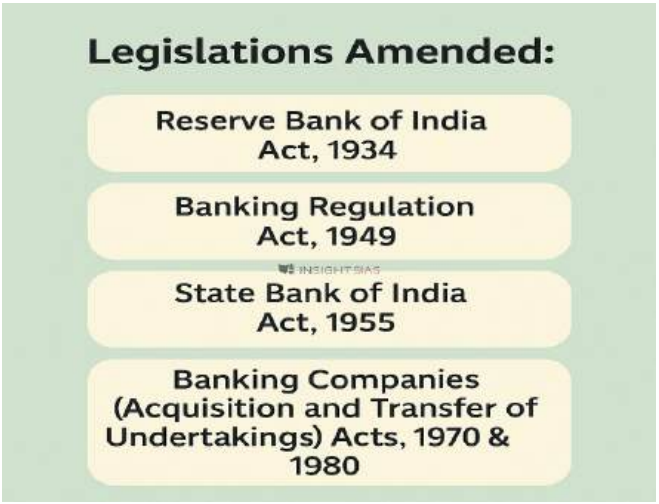
Context: The Banking Laws (Amendment) Act, 2025 will come into effect from 1st August 2025, introducing reforms to

bank governance, audit transparency, depositor protection, and cooperative bank regulation.

About The Banking Laws (Amendment) Act, 2025:

What Is It?

A comprehensive reform law notified by the **Ministry of Finance**, the Act amends 5 key legislations governing the Indian banking sector to improve governance, transparency, and depositor safety.



Key Objectives:

- Strengthen bank governance mechanisms.
- Ensure depositor and investor protection.
- Enhance audit quality in public sector banks (PSBs).
- Align cooperative bank rules with constitutional standards.

Key Features of the Act

1. **Redefining 'Substantial Interest' Threshold:**
   - The limit for 'substantial interest' in banks is revised from ₹5 lakh to **₹2 crore**.
   - This modernizes outdated thresholds (unchanged since 1968) to reflect inflation and sectoral growth.
2. **Reforming Director Tenures in Cooperative Banks:**
   - **Tenure raised from 8 to 10 years** (excluding chairperson & full-time directors), in sync with the **97th Constitutional Amendment**.
3. **Unclaimed Assets to Investor Education and Protection Fund (IEPF):**
   - PSBs can now **transfer unclaimed shares, interests, and bond redemptions** to IEPF.
   - This aligns PSBs with norms under the **Companies Act**, ensuring efficient fund recycling.
4. **Audit Transparency and Independence:**
   - PSBs are empowered to **determine remuneration for statutory auditors**, promoting better audit quality and enabling engagement of top-tier professionals.
5. **Streamlining Statutory Reporting:**
   - Reporting timelines to **RBI** are revised from "every Friday" to **end-of-fortnight/month/quarter**, easing operational burden and improving data relevance.

Significance for Indian Banking Sector:

- **Modernizes Regulatory Norms:** Updates 50-year-old provisions to match current financial realities.
- **Improves Cooperative Bank Accountability:** Aligns tenure rules with constitutional mandates for democratic functioning.
- **Strengthens Depositor Confidence:** By securing unclaimed assets and improving audit standards.

FINANCIAL FRAUD RISK INDICATOR

Context: The Reserve Bank of India (RBI) has advised all banks to integrate the Financial Fraud Risk Indicator (FRI) developed by the Department of Telecommunications (DoT).

About Financial Fraud Risk Indicator:

- **What is FRI?**
  - The **Financial Fraud Risk Indicator (FRI)** is a risk-classification system designed to flag mobile numbers linked to financial fraud. It enables **real-time, risk-based intervention** in banking and UPI transactions.
- **Launched By:** Digital Intelligence Unit (DIU) under the Department of Telecommunications (DoT) in May 2025.
- **Aim of FRI:** To help banks and financial service providers identify, prevent, and mitigate cyber-enabled financial frauds by offering risk insights linked to mobile numbers.
- **How FRI Works?**
  - **Risk Classification**: Mobile numbers are classified as **Medium**, **High**, or **Very High Risk** based on suspected fraud links.
  - **Data Sources:** Inputs come from:
    - National Cybercrime Reporting Portal (NCRP) of MHA
    - DoT's Chakshu platform
    - Reports from banks and UPI providers
  - **Mobile Number Revocation List (MNRL):** Lists disconnected or deactivated numbers involved in fraud, shared regularly with

financial stakeholders.

- **Key Features of FRI:**
  - **API-based Integration**: Banks can plug FRI directly into their systems for real-time fraud alerts and response.
  - **Proactive Fraud Prevention**: Banks can delay, decline, or flag transactions tied to high-risk mobile numbers.
  - **Collaborative Surveillance**: Encourages **shared intelligence** between DoT, RBI, and private players like PhonePe, Paytm, HDFC, ICICI, PNB.
  - **Targeted Alerts**: Enables customer warnings, secondary verification, or stronger KYC enforcement.
  - **Supports Digital India Vision**: Boosts public trust in digital payments, especially in the UPI ecosystem, where India leads globally in real-time payment volume.

VARIABLE RATE REVERSE REPO (VRRR)

Context: The Reserve Bank of India (RBI) conducted a ₹1 lakh crore 7-day Variable Rate Reverse Repo (VRRR) auction to manage surplus liquidity, which had peaked at ₹3.75 lakh crore.

About Variable Rate Reverse Repo (VRRR):

- **What is VRRR?**
  - The Variable Rate Reverse Repo (VRRR) is a monetary policy tool used by the **RBI to absorb excess liquidity** from the banking system for a fixed duration, with the interest rate determined through auction rather than being fixed.
  - It allows banks to lend funds to the RBI for a period longer than one day — typically 7, 14, or 28 days — in exchange for interest.
- **Announced By:** The **Reserve Bank of India (RBI)** as part of its liquidity management framework.
- **Objective:**
  - To **manage surplus liquidity** in the financial system.
  - To **fine-tune short-term interest rates** and strengthen the monetary transmission mechanism.
  - To provide a **market-driven interest rate** environment in short-term lending between banks and the central bank.
- **How It Works?**
  - The RBI announces a VRRR auction specifying the total amount and tenor (e.g., 7 days).
  - Banks submit competitive bids indicating the amount and rate at which they are willing to lend funds to RBI.
  - RBI selects the **cut-off rate** based on bids received and accepts offers at or above that rate.
  - Banks earn interest based on the market-determined rate during the period of the VRRR.
- **Key Features:**
  - **Market-determined rates:** Interest rates are discovered via auction, not fixed by RBI.
  - **Term-based:** Unlike the overnight fixed reverse repo, VRRR operates for **multiple days**, often 7 or 14.
  - **Liquidity absorption tool:** Used when there is **excess liquidity** in the banking system.
  - **Upper rate limit:** VRRR rate cannot exceed the prevailing **Repo Rate**.
  - **Flexibility:** RBI can conduct VRRR of varying durations depending on liquidity conditions.
- **Implications of VRRR:**
  - **Money Market Impact:** Leads to **tighter liquidity**, pushing up short-term rates like the call money and TREPS (tri-party repo) rates.
  - **Bond Market Impact:** An increase in VRRR rates may **raise short-term bond yields**, making borrowing costlier for the government and corporates.
  - **Banking Sector Impact:**
    - Offers banks a **higher return on surplus funds**, enhancing profitability.
    - However, it temporarily **locks funds**, potentially limiting their availability for lending and investment.

RBI'S NEW POLICY ON PRE-PAYMENT CHARGES

Context: The Reserve Bank of India (RBI) has barred lenders from levying pre-payment charges on floating-rate loans availed by individuals and Micro and Small Enterprises (MSEs).

- This directive comes into effect from 1 January 2026.

About RBI's New Policy on Pre-Payment Charges**:**

- **What are Pre-Payment Mechanisms?**
  - **Pre-payment** refers to the **early repayment** of a loan (partially or fully) before its scheduled tenure ends.
  - The pre-payment mechanism is the process by which borrowers can repay their loan ahead of time—either in part (known as part-prepayment) or in full (foreclosure/ early closure)—thereby reducing interest burden and/or tenure.
- **How Pre-Payment Mechanism Works?**
  - **Loan Agreement Terms:** Specifies if pre-payment is allowed, charges applicable, lock-in period, and payment limits.
  - **Types of Pre-Payment:**
    - **Part-Prepayment:** Lump sum paid alongside EMIs to reduce principal.
    - **Full Prepayment (Foreclosure):** Clearing the entire outstanding loan early.
  - **Impact on Loan:**
    - Lowers interest burden (more effective if done early).
    - Reduces either EMI or loan tenure—borrower's choice.
- **What is the Decision?**
  - **Ban on Charges:** No pre-payment penalties will be allowed on **floating-rate loans**, both for individuals (non-business purposes) and MSEs.
  - **Applicability:** Applies to new or renewed loans sanctioned on or after January 1, 2026.
  - **Includes Partial and Full Payments:** Pre-payments can be made without penalty—with no lock-in period and regardless of fund source.
- **Need for this move:**
  - **Unequal Lending Practices:** RBI's reviews highlighted **inconsistent and opaque** practices by lenders in imposing pre-payment fees.
  - **Borrower Grievances:** Borrowers, especially MSEs, faced difficulties in early loan closure, leading to **unfair financial burdens.**
  - **Promote Credit Mobility:** It enhances **loan portability** and encourages competition among lenders.
- **Significance of the Move:**
  - **Ease of Doing Business:**
    - Reduces credit friction for MSEs—a crucial segment for India's employment and GDP.
    - Supports **Atmanirbhar Bharat** and startup ecosystem by enhancing financial freedom.
  - **Consumer Protection:** Aligns with **fair lending norms**, safeguarding borrowers from hidden charges.
  - **Promotes Transparency:** Mandates that lenders clearly disclose pre-payment terms in the **sanction letter**, **loan agreement**, and **Key Facts Statement (KFS)**.
  - **Boosts Financial Inclusion:** Encourages more **first-time borrowers**, especially in rural areas and among women entrepreneurs, to access formal credit.
  - **Harmonised Lending Environment:** Unifies rules across financial institutions like **commercial banks, NBFC-ULs, urban cooperative banks**, and **RRBs**, especially for loans up to ₹50 lakh.

Topics: Indian Financial Capital Market

NATIONAL STOCK EXCHANGE OF INDIA (NSE)

Context: The National Stock Exchange (NSE) surpassed the 23-crore unique trading account mark in July 2025, just three months after reaching 22 crores.

About National Stock Exchange of India ***(NSE):***

- **What is NSE?**
  - The **National Stock Exchange (NSE)** is India's leading stock exchange and one of the **largest globally** by market capitalization and derivative trading volume.
  - It is considered an **institution of national importance** and a **critical market infrastructure institution.**
- **Incorporated:** 1992

- **Recognised by SEBI:** April 1993
- **Commenced operations:** 1994
- **Headquarters**: Mumbai, Maharashtra
- **Key Objectives:**
  - Democratise capital markets by making trading accessible to all eligible participants.
  - Ensure transparency, efficiency, and technological innovation in market operations.
  - Promote financial inclusion through widespread investor participation and awareness.
- **Salient Features:**
  - **Electronic Trading Pioneer:** First Indian exchange to introduce screen-based, anonymous order-driven trading.
  - **Global Ranking:** 5th largest stock exchange by market cap; largest derivatives exchange globally (by contracts traded).
  - **Technology-Driven:** Robust, resilient platform ensuring high-speed, secure transactions across asset classes.
  - **Regulated Access:** Open to all who meet qualifications—no cartel of brokers, promoting a level playing field.
  - **Innovation Hubs:**
    - **NSE IX** at GIFT City (multi-asset global trading).
    - **NSE EMERGE** (platform for SMEs/ startups).
    - Social Stock Exchange (2023) for fundraising by non-profits.
- **Core Functions:**
  - Operates markets for equity, debt, derivatives, ETFs, REITs, InvITs.
  - Provides clearing, settlement, and risk management services.
  - Runs investor education and awareness programs.

NATIONAL FINANCIAL REPORTING AUTHORITY

Context: Shri Nitin Gupta (Retd. IRS), former CBDT Chairman, has taken charge as the new Chairperson of the National Financial Reporting Authority (NFRA).

NFRA

सत्यमेव जयते
National Financial Reporting Authority
Government of India

About NFRA (National Financial Reporting Authority):

- **What is NFRA?**
  - NFRA is an independent regulatory authority under the Ministry of Corporate Affairs, tasked with improving transparency, credibility, and quality of financial reporting and auditing in India.
- **Constituted on:** 1st October 2018
- **Established under:** Section 132(1) of the Companies Act, 2013
- **Headquarters:** New Delhi, India
- **Objectives and Mandate:**
  - **Regulate and enforce compliance** with accounting and auditing standards.
  - Recommend policies and standards for corporate financial governance.
  - Monitor the quality of auditing services and suggest improvements.
  - Investigate professional misconduct of auditors in certain classes of companies.
  - Uphold **public and investor interest** by ensuring high-quality financial disclosures.
- **Coverage: Who Comes Under NFRA?**
  - **Listed companies** on Indian or foreign stock exchanges.
  - **Unlisted public companies** meeting any of the following:
    - Paid-up capital ≥ ₹500 crore
    - Turnover ≥ ₹1,000 crore
    - Loans, deposits, debentures ≥ ₹500 crore
  - **Insurance companies, banks, power companies**, and those under special Acts.
  - **Foreign subsidiaries/associates** of Indian companies contributing ≥ 20% of income or net worth.
  - Any entity referred by the **Central Government in public interest**.
- **Features of NFRA:**
  - Statutory autonomy with investigative powers.
  - Can issue directions, debar auditors, and impose penalties.
  - Ensures global alignment with international standards (IFRS, ISA).
  - Promotes corporate governance, investor trust, and audit quality.
  - Strengthens oversight on statutory auditors and financial reporting ecosystem.
- **Significance of NFRA:**
  - Acts as a watchdog for corporate financial discipline.
  - Bridges gaps in audit oversight missed by self-regulatory bodies like ICAI.
  - Enhances investor confidence, especially in large unlisted entities.

CATASTROPHE BONDS (CAT BONDS)

Context: India's growing vulnerability to climate disasters has reignited policy interest in catastrophe bonds (cat bonds) as a financial instrument for disaster-risk financing.

About Catastrophe Bonds (*Cat Bonds*):

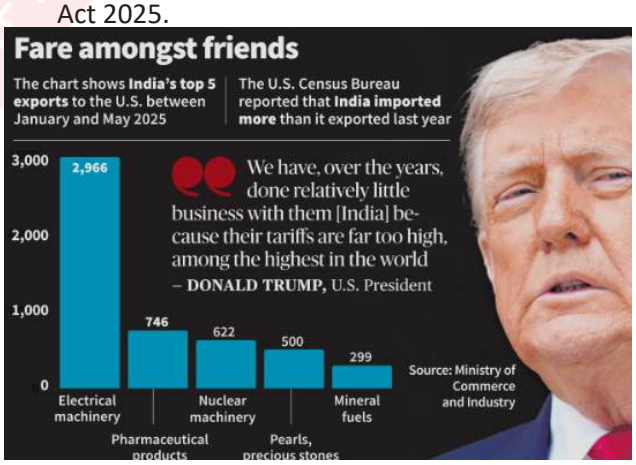
- **What are Cat Bonds?**
  - Catastrophe bonds (cat bonds) are **insurance-linked securities** that convert disaster risk into **tradable financial products**. They transfer the financial risk of natural disasters—like earthquakes, cyclones, and floods—from governments or insurers to **global capital markets**.
- **How Do Cat Bonds Work?**
  - **Sponsorship:** A government or insurance entity (the sponsor) issues the bond and pays a premium.
  - **Issuance:** Intermediaries like the World Bank or ADB issue the bond to investors to reduce counterparty risk.
  - **Trigger Event:** If a predefined disaster occurs (e.g., a 7.0 magnitude earthquake), investors lose part or all of the principal, which goes to the sponsor for relief and recovery.
  - **No Disaster:** If no disaster occurs, investors receive regular high-yield interest (coupon payments), and the principal is repaid at maturity.
- **Key Features of Cat Bonds:**
  - **High-Yield Returns:** Investors earn higher interest rates due to the risk of principal loss.
  - **Parametric Triggers:** Pay-outs are linked to measurable event thresholds (e.g., wind speed, Richter scale magnitude).
  - **Independence from Market Risk:** Natural hazards are uncorrelated with stock market fluctuations, offering true portfolio diversification.
  - **Fast Disbursal:** Enables **quick financial assistance** post-disaster, reducing reliance on slow government processes.
- **Significance of Cat Bonds:**
  - **Disaster-Resilient Public Finance:** Shields national budgets from sudden fiscal shocks after natural calamities.
  - **Regional Risk Pooling:** A South Asian cat bond can distribute risk and lower premiums for countries with shared vulnerabilities.
  - **Investment Diversification**: Pension funds and global investors prefer cat bonds to hedge against financial market risks.
- **Limitations:**
  - **Payout Gaps:** Bonds with narrowly defined triggers may deny pay-outs despite real damage.
  - **Perception of Waste**: If no disaster occurs, high premiums may be politically questioned.
    Design Sensitivity: Requires transparent modelling, actuarial accuracy, and robust data to avoid failure

Topics: External Trade and Capital

U.S. PRESIDENT ANNOUNCED A 25% TARIFF ON INDIAN IMPORTS

Context: U.S. President announced a 25% tariff on Indian imports effective August 1, 2025, citing high trade barriers and India's continued energy and defence ties with Russia.

- The announcement includes a Russia-related penalty, linked to the proposed Russian Sanctions Act 2025.



About U.S. President announced a 25% tariff on Indian imports:

- **What it is?**
  - A **25% import tariff** on all eligible goods shipped from India to the U.S.
  - Additional **penalty tariffs** for India's continued **oil and defence trade with Russia**.
- **Objective Behind the Tariff:**
  - **Address Trade Imbalance:** To pressure India into reducing its tariffs and removing non-tariff barriers.
  - **Punish Russia-Aligned Trade:** To dissuade

India from continuing energy imports from Russia amid Ukraine war sanctions.
    - **Push for Bilateral Deal:** To hasten conclusion of a **"fair and reciprocal"** India–U.S. trade agreement.
- **Key Features of the Announcement**
    - **Trade War Rhetoric:** Trump called India's trade policies "**obnoxious**" and blamed high tariffs and opaque rules.
    - **Linked to Russia Sanctions Act:** The Russia Sanctions Act 2025, under U.S. legislative review, threatens up to 500% duties on nations trading oil with Russia.
    - **Preceded by Negotiation Failure:** The tariff follows the fifth round of failed trade talks between India and the U.S. in Washington.
    - **Past Suspension Now Revoked:** A previously suspended 26% tariff (April 2025) is now being reinstated in a harsher form.
    - **India's Response:** India's **Ministry of Commerce** stated it is reviewing the situation and remains committed to protecting farmers, MSMEs, and entrepreneurs.
        - India cited recent **FTA with the UK** as an example of its fair-trade intent.
- **Significance for India:**
    - **Export Sector Impact:** India's exporters may lose competitiveness in the U.S. market, especially in textile, pharma, and engineering sectors.
    - **Bilateral Strain:** The move could derail progress on the India-U.S. trade agreement, and weaken diplomatic synergy in Quad and Indo-Pacific engagements.
    - **Strategic Autonomy Challenge:** India's multi-alignment policy—especially its Russia ties—faces growing pressure from Western trade-linked coercion.

OPERATION FIRE TRAIL

Context: In a major anti-smuggling action, the Directorate of Revenue Intelligence (DRI) seized ₹35 crore worth of banned Chinese firecrackers during "Operation Fire Trail" across Indian ports.

About Operation Fire Trail:

- **What is it?**
    - Operation Fire Trail is a **special intelligence-led enforcement operation** launched by the DRI to crack down on **illicit imports of Chinese firecrackers**, posing environmental, legal, and safety risks.
- **Launched by: Directorate of Revenue Intelligence (DRI)**, India's premier anti-smuggling agency under the Central Board of Indirect Taxes and Customs (CBIC).
- **Objective:**
    - Detect and intercept **illegal consignments of restricted explosives**, especially Chinese fireworks.
    - Prevent **misuse of SEZs (Special Economic Zones)** for unauthorized diversion into the Domestic Tariff Area (DTA).
    - Ensure compliance with India's **Foreign Trade Policy and Explosive Rules, 2008**.
- **Key Features:**
    - **Coordinated Multi-Port Seizure:** Seized **100 metric tonnes of Chinese fireworks** disguised as goods like "Mini Decorative Plants" and "Artificial Flowers".
    - **SEZ Misuse Detected:** Smugglers used a **KASEZ unit and fake IEC holders** to divert firecrackers into domestic markets without proper licensing.
    - **Legal Enforcement:** Key suspect arrested and remanded to **judicial custody**, showcasing the DRI's legal deterrence strategy.
    - **Safety & Environmental Risk Mitigation:** Firecrackers contained banned toxic chemicals like lithium, red lead, and copper oxide—posing explosion and pollution hazards.
    - **Trade Regulation Compliance:** Crackdown ensured enforcement of the **ITC (HS) policy** where import of fireworks is a **'Restricted' item**, requiring **DGFT** and **PESO approvals**.
    - **Supply Chain Security:** Operation prevented **potential port disasters**, protecting infrastructure and logistics networks.

Topics: Inclusive growth and issues arising from it.

MOTOR VEHICLE AGGREGATOR GUIDELINES (MVAG), 2025

Context: The Ministry of Road Transport and Highways notified the Motor Vehicle Aggregator Guidelines (MVAG), 2025, revising the 2020 norms to reflect new mobility trends like bike taxis, EVs, and app-based autorickshaws.

About Motor Vehicle Aggregator Guidelines (MVAG), 2025:

- **What It Is?**
  - MVAG is a **regulatory framework** under the **Motor Vehicles Act, 1988** that governs how app-based ride-hailing platforms like Ola, Uber, and Rapido operate in India.
- **Issuing Ministry:** Ministry of Road Transport and Highways, Government of India
- **Key Features of MVAG 2025:**
- **Driver Welfare and Earnings:**
  - Drivers must receive at least **80% of the fare** if using their own vehicle.
  - If using aggregator-owned vehicles, they must get **minimum 60% share**.
  - Mandatory **health insurance of ₹5 lakh** and **term insurance of ₹10 lakh** per driver.
  - **Quarterly training** for low-rated drivers (bottom 5 percentile).
- **Passenger Protection Measures:**
  - ₹5 lakh **mandatory travel insurance** per passenger.
  - Aggregators must resolve complaints within **3 days** and inform passengers of outcomes.
  - Fare must be charged only from **pick-up to drop-off point**.
- **Regulated Fare Structure:**
  - State governments to fix **base fare** per vehicle category.
  - Aggregators can charge **50% less** than base fare or **up to twice** as dynamic pricing cap.
  - This introduces **price predictability** and caps surge pricing.
- **Penalties for Ride Cancellations:**
  - **10% penalty** on either driver or rider for unjustified cancellations (capped at ₹100).
  - Valid reasons for cancellations must be listed on apps/websites for transparency.
- **Bike-Taxi Recognition:**
  - For the first time, **non-transport motorcycles** allowed for ride-hailing, subject to state approval.
  - Provides legal clarity for platforms like **Rapido** in regulatory grey zones.
- **EV Promotion & Accessibility:**
  - States can now mandate **annual EV adoption targets** for aggregators.
  - Inclusion of **Divyangjan-accessible vehicles** made compulsory to enhance inclusivity.
- **Enhanced Driver Screening:**
  - Drivers must undergo **police verification**, **medical tests**, and **psychological assessments** before onboarding.
  - Aggregators must provide **induction training** and annual refresher courses.
- **Grievance Redressal and Licensing Norms:**
  - Aggregators must appoint a **grievance officer**, display contact details on app/ website.
  - A **centralised portal** will manage licences, renewals, deposits — easing compliance.
- **Strict Compliance and Penalties:**
  - Violations may attract **fines from ₹1 lakh to ₹1 crore**.
  - Repeat offenders face **license suspension for 3 months**, and eventual cancellation.

FOURTH INTERNATIONAL FINANCING FOR DEVELOPMENT CONFERENCE (FFD4)

Context:

The Fourth International Financing for Development Conference (FfD4) is underway in Seville, Spain, focusing on overhauling the global financial architecture.

About Fourth International Financing for Development Conference **(*FfD4*):**

- **What It Is?**
  - A United Nations-led global forum to address sustainable development financing gaps and reform global economic governance.
- **Host:** Held in Seville, Spain in 2025 under the aegis of the United Nations Department of Economic and Social Affairs (UNDESA).
- **Objective:** To align development finance with climate goals, restore trust between developed and developing nations, and create equitable financial systems.
- **Key Features of FfD4:**
  - **Multi-Stakeholder Engagement**: Includes governments, multilateral institutions, civil

society, and think tanks.
    - **Reform-Oriented Agenda:** Focuses on restructuring **Multilateral Development Banks (MDBs)** and addressing systemic issues like debt, taxation, and accountability.
    - **Integration with Climate Agendas**: Lays the groundwork for coordinated actions leading up to **COP30**.

About Ongong Seville Commitment and the Road to COP30 (Belem):

- **Scaling Climate Finance:** Emphasized the need to reach $1.3 trillion by 2035 through a "Baku to Belem" (B2B) roadmap.
- **Shift from Negotiation to Implementation:** COP30 leaders stressed that the UNFCCC system must now deliver real-world results, not just policy frameworks.
- **Civil Society Inclusion:** Advocated for expanding spaces for indigenous peoples, women, and youth in future COPs.
- **Global Solidarity Levies:** Proposed innovative tools like taxing private jets and financial flows to create non-debt burdensome climate finance.
- **Equity Focus:** Called out the richest 1% for contributing to 50% of emissions and urged accountability.

Significance for India and Global South:

- Reinforces demands for **climate justice and equitable finance**.
- Pushes for **greater South-South cooperation** and voice of emerging economies.
- Aligns with India's G20 call for reforming global financial institutions and shifting climate finance beyond loans.

ZE FIELD TRIALS

Context: Punjab Agricultural University (PAU) is facing backlash over its GM maize field trials, with environmental groups urging withdrawal of the NoC.

About GM Maize Field Trials:

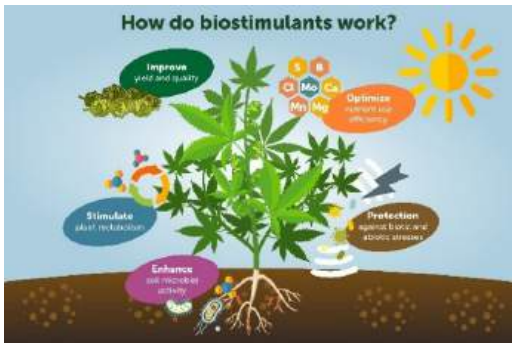
- **What is Being Tested?**
    - Genetically Modified (GM) maize with **herbicide tolerance (HT)** and **insect resistance (BT)** traits.
    - Developed by **Bayer**, this maize variant is under **biosafety trial phase BRL-I and BRL-II** stages.
- **Institutions Involved:**
    - Punjab Agricultural University (PAU) – Research implementation
    - Bayer – Technology developer
    - Department of Biotechnology (DBT) – Regulatory authority
- **Objective of the Trials:**
    - Assess agronomic performance and environmental biosafety of GM maize under controlled research conditions.
    - Provide **evidence-based inputs** to policymakers, without pushing for commercial release.
- **Key Features:**
    - **Non-commercial and confined field trials** under strict regulations.
    - **BT + HT traits** integrated to improve pest and weed resistance.
    - Reviewed and approved by a **multi-institutional expert panel** at state level.
    - **Precedent of similar evaluations**, e.g. BT cotton, by PAU researchers.
    - Focus on **data-driven assessment**, not speculative claims.
- **Significance:**
    - Supports **scientific evaluation** of crop biotechnology innovations.
    - Balances environmental concerns with **agricultural productivity needs.**
    - Encourages **independent university research**, maintaining transparency.

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

BIOSTIMULANTS

Context: Union Agriculture Minister has directed states to **halt forced sales of biostimulants**, amid rising complaints over efficacy and regulatory violations.

- The Centre is tightening oversight on biostimulants through revised specifications and regulatory checks under the Fertiliser Control Order (FCO), 1985.

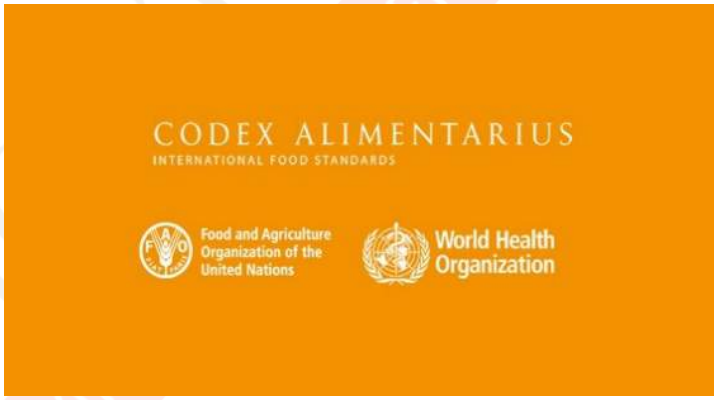


About Biostimulants:

- **Definition:**
  - Biostimulants are substances or microorganisms that, when applied to plants or soil, enhance nutrient uptake, plant growth, yield, and stress resistance, without being classified as fertilisers or pesticides.
- **Key Characteristics:**
  - **Non-nutrient input:** Unlike fertilisers, they stimulate plant physiological processes.
  - **Derived from nature:** Often made from plant residues, seaweed extracts, or microbes.
  - **Not a pesticide substitute:** They don't directly control pests, and are regulated separately under FCO.
  - **Crop-specific efficacy:** Applied for specific crops like paddy, onion, brinjal, chilli, etc.
- **Regulatory Framework:**
  - **Legal Backing:**
    - Included under **Fertiliser Control Order (FCO), 1985** through an amendment in February 2021.
    - Must comply with toxicity tests, eco-safety trials, and bio-efficacy studies.
  - **Mandatory Testing:**
    - Five **acute toxicity tests** (oral, dermal, inhalation, eye, skin).
    - Four **eco-toxicity tests** (on fish, birds, honeybees, and earthworms).
    - Trials at **3 agro-ecological zones** over a season, with **3 different doses**.
  - **Central Biostimulant Committee:**
    - Constituted in 2021 for 5 years under the **Agriculture Ministry**.
    - Advises on product approvals, testing methods, and lab standards.
- **Government Action & Current Issues**
  - **Misuse reported:** Retailers forcing farmers to buy biostimulants with subsidised fertilisers.
  - **Crackdown on unregistered products:** From 30,000+ unregulated products, only 650 now permitted.
  - **March 2024 deadline lapse:** Provisional licences expired and unsold stocks now ineligible for sale.
  - **Crop-specific specs:** Notified in May 2025 for tomato, chilli, paddy, cotton, soybean, and more.
- **India's Growing Biostimulant Market:**
  - Valued at **USD 410 million in 2025**, projected to reach **USD 1.13 billion by 2032**.
  - Driven by demand for **low-input sustainable agriculture** and climate-resilient practices.

CODEX ALIMENTARIUS

Context: India's millet standard and leadership in Codex committees were appreciated at the 88th Codex Executive Committee (CCEXEC88) in Rome.



About Codex Alimentarius:

- **What it Is?**
  - Codex Alimentarius is a collection of internationally recognized food standards, guidelines, and codes of practice. It promotes **food safety, consumer protection**, and **fair-trade** practices in international food commerce.
- **Established in:** 1963 by FAO and WHO.
- **Headquarters:** Rome, Italy.
- **Objectives:**
  - To ensure **consumer health protection** and promote **fair practices** in food trade.
  - To assist countries in harmonizing food regulations to reduce **non-tariff barriers**.
- **Key Features:**
  - **Science-based standards:** Framed with inputs from global risk assessment bodies (e.g. JECFA, JMPR).
  - **WTO alignment:** Forms reference point for the SPS Agreement in WTO trade disputes.
  - **Voluntary yet influential:** Though not mandatory, it influences national legislation worldwide.
  - **Comprehensive coverage:** Includes hygiene, additives, labelling, pesticide residues, contaminants, etc.

- **Transparent process:** Open, inclusive committee discussions ensure fair global representation.

- **India's Contributions:**
  - **Millet Standard Leadership:** India chaired efforts to develop Codex standard for whole millets, co-chaired by Mali, Nigeria, Senegal.
  - **Codex Committee Leadership:** Chairs the Codex Committee on Spices and Culinary Herbs (CCSCH) since 2014.
  - **Fresh Produce Standards:** Led new standards on dates, co-chairing turmeric and broccoli standardisation.
  - **Regional Capacity Building:** Provided training to Bhutan, Nepal, Sri Lanka under Codex Trust Fund mentorship.
  - **Strategic Planning Role:** Contributed to SMART KPIs for Codex Strategic Plan 2026–2031.

ICAR – INDIAN COUNCIL OF AGRICULTURAL RESEARCH

Context:

The **97th Foundation Day** of ICAR was celebrated in New Delhi, where Union Agriculture Minister addressed scientists and farmers.

About ICAR – Indian Council of Agricultural Research:

- **What is ICAR?**
  - The **Indian Council of Agricultural Research (ICAR)** is an autonomous apex body under the **Ministry of Agriculture and Farmers' Welfare**, responsible for coordinating agricultural education, research, and extension across India.
- **Founded:** 16 July 1929 (as Imperial Council of Agricultural Research).
- **Reconstituted under:** Societies Registration Act, 1860.
- **Headquarters:** Located in **New Delhi**.
- **Parent Body:** Department of Agricultural Research and Education (DARE).
- **President (Ex-Officio):** Union Minister of Agriculture.
- **Key Functions:**
  - **Promote Education & Research:** Plan, fund, and coordinate R&D in agriculture, fisheries, animal husbandry, agroforestry, home science, and allied fields.
  - **Technology Transfer & Extension:** Act as a central knowledge hub for farmers through publications, exhibitions, and technology outreach programs.
  - **Capacity Building:** Support skill development and higher agricultural education through competitive examinations and recruitment (ASRB).
  - **Consultancy & Collaboration:** Partner with national institutions like CSIR, BARC, and international bodies for integrated rural development and post-harvest solutions.
  - **Policy Advice:** Guide government on sustainable practices, innovation, and food security.
- **Major Initiatives Announced at ICAR's 97th Foundation Day:**
  - **Viksit Krishi Sankalp Abhiyan:** Largest farmer-scientist dialogue, 500 research areas identified for region- and crop-specific needs.
  - **Field-Guided Research Agenda:** Farmer-driven research priorities and teams to adopt "One Team, One Goal" model.
  - **Natural Farming Push:** Focus on chemical-free, sustainable agriculture for long-term environmental health.
  - **Fertilizer Testing Kits:** Portable kits to help farmers verify soil and input quality, curb adulteration.
  - **Toll-Free Grievance Helpline:** To report fraud in seeds and fertilizers, crackdown on 30,000+ unregulated bio-stimulants.
  - **Ethical MoUs and Pricing Oversight:** Mandatory price fairness in ICAR-industry collaborations to protect farmer interests.

PRIME MINISTER DHAN-DHAANYA KRISHI YOJANA

Context: The Union Cabinet has approved the Prime Minister Dhan-Dhaanya Krishi Yojana, a ₹24,000 crore/year scheme for six years starting 2025–26, to boost agricultural development in 100 low-performing districts.

About Prime Minister Dhan-Dhaanya Krishi Yojana:

- **What It Is?**
  - A **targeted agricultural transformation programme** aimed at low-productivity, low-credit, and moderate crop intensity districts through convergence of central schemes.
- **Announced In:** Union Budget 2025–26 by Finance Minister Nirmala Sitharaman.
- **Ministry Involved:** Coordinated by **Ministry of Agriculture**, with **NITI Aayog** providing strategic guidance and monitoring support.
- **Budget & Duration:**
  - ₹24,000 crore annually.
  - Implemented over **6 years** (2025–2031).
- **Core Objectives:**
  - **Boost Agricultural Productivity:** Close yield gaps using scientific practices and tech infusion.
  - **Promote Crop Diversification:** Encourage sustainable, climate-resilient and high-value crops.
  - **Enhance Post-Harvest Infrastructure:** Panchayat/block-level cold storages and logistics.
  - **Improve Irrigation Coverage:** Repair and expand irrigation networks to ensure water efficiency.
  - **Strengthen Credit Access:** Facilitate timely short- and long-term credit via institutional channels
- **Key Features of PMDDKY:**
  - **Convergence of 36 Schemes** from 11 ministries (e.g. RKVY, PMKSY, PMFBY, etc.).
  - **District Agriculture & Allied Plan** to be prepared by "District Dhan Dhaanya Samiti" (with Collector & progressive farmers).
  - **Performance Monitoring:** 117 **Key Performance Indicators** tracked monthly via a national dashboard.
  - **Central Nodal Officers (CNOs)** assigned for field review and oversight.
  - **Collaboration with Agri Universities** and technical institutions for knowledge-sharing.
- **District Selection Criteria:**
  - Based on:
    - Low productivity,
    - Moderate cropping intensity,
    - Low credit flow.
  - Every state/UT to have at least one district selected.
  - Proportionate allocation based on **net cropped area and operational holdings**.

GM MAIZE FIELD TRIALS

Context: Punjab Agricultural University (PAU) is facing backlash over its GM maize field trials, with environmental groups urging withdrawal of the NoC.

About GM Maize Field Trials:

- **What is Being Tested?**
  - Genetically Modified (GM) maize with **herbicide tolerance (HT)** and **insect resistance (BT)** traits.
  - Developed by **Bayer**, this maize variant is under **biosafety trial phase BRL-I and BRL-II** stages.
- **Institutions Involved:**
  - Punjab Agricultural University (PAU) – Research implementation
  - Bayer – Technology developer
  - Department of Biotechnology (DBT) – Regulatory authority
- **Objective of the Trials:**
  - Assess agronomic performance and **environmental biosafety** of GM maize under controlled research conditions.
  - Provide **evidence-based inputs** to policymakers, without pushing for commercial release.
- **Key Features:**
  - **Non-commercial and confined field trials** under strict regulations.
  - **BT + HT traits** integrated to improve pest and weed resistance.
  - Reviewed and approved by a **multi-institutional expert panel** at state level.
  - **Precedent of similar evaluations**, e.g. BT cotton, by PAU researchers.
  - Focus on **data-driven assessment,** not speculative claims.
- **Significance:**
  - Supports **scientific evaluation** of crop biotechnology innovations.

- Balances environmental concerns with agricultural productivity needs.
- Encourages **independent university research**, maintaining transparency.

AGRICULTURAL MONITORING & EVENT DETECTION (AMED) API

Context:
Google unveiled the Agricultural Monitoring & Event Detection (AMED) API to make Indian agriculture more data-driven, while also collaborating with IIT-Kharagpur under the Amplify Initiative to enrich AI with India's linguistic and cultural diversity.

About Agricultural Monitoring & Event Detection (AMED) API:

- **What is AMED API?**
  - The AMED API is an open-source **AI-based agricultural monitoring tool** developed by Google DeepMind and Google's Partnerships Innovation team.
  - It offers field-level crop insights and historical land-use data to improve decision-making across India's agriculture sector.
- **Developed By: Google DeepMind**, in collaboration with local partners including **TerraStack** and researchers from **IIT-Kharagpur** under the broader Google AI initiatives in India.
- **Objective of AMED API:**
  - Enable **real-time, granular insights** into agricultural activities across individual fields.
  - Empower agri-tech developers, financial institutions, and policymakers with **crop-specific and location-based intelligence**.
  - Support sustainable farming, climate adaptation, and **data-backed rural lending systems**.
- **How AMED API Works?**
  - **Satellite Imaging & AI Analysis:** Uses remote sensing and deep learning to track field activity and detect cropping patterns.
  - **Field-Level Intelligence:** Provides detailed data on crop type, field size, crop season, and 3-year land-use history.
  - **Data Refresh Frequency:** Updates **every two weeks**, enabling near real-time crop monitoring.
  - **Integration-Ready Architecture:** Designed for plug-in use by agri-tech startups, financial firms, and government agencies
- **Key Features of AMED API:**
  - **Crop-Type Detection:** Identifies crop varieties across seasons with accuracy.
  - **Historical Crop Data:** Offers 3 years of field-specific cropping and land-use history.
  - **Dynamic Updating:** Refreshes biweekly to reflect changing ground realities.
  - **Localized Impact:** Empowers India-specific applications like rural lending, yield prediction, and climate risk analysis.
  - **Complementary to ALU API:** Builds on Google's earlier Agricultural Landscape Understanding (ALU) API by adding event detection and crop-level depth.

HTBT COTTON

Context: An expert panel under India's biotech regulator has submitted a favourable biosafety report on HTBt cotton, bringing it one step closer to commercial approval by the Genetic Engineering Appraisal Committee (GEAC).

About HTBt cotton:

- **What is HTBt Cotton?**
  - HTBt (Herbicide-Tolerant Bacillus thuringiensis) cotton is a **genetically modified cotton variety** that combines two traits:
    - **Insect resistance** (via Bt gene), and
    - **Tolerance to herbicides** like **glyphosate**, enabling **simplified weed control** in cotton farming.
- **Developed By:** Developed by **Mahyco-Monsanto Biotech** (Bayer), featuring the Bollgard II Roundup Ready Flex (BG-II RRF) trait.
- **How It Is Developed?**
  - **Genetic engineering** introduces **Cry genes** (from Bt bacterium) for pest resistance.
  - Additional integration of **CP4-EPSPS gene**

enables **herbicide tolerance**, allowing crops to survive glyphosate spraying while weeds perish.

- **Key Features of HTBt Cotton:**
  - **Dual-Trait Technology:** Combines **bollworm resistance** and **herbicide tolerance** in a single crop.
  - **Weed Management Efficiency:** Enables **over-the-top glyphosate spraying**, minimizing the need for manual weeding and labour.
  - **Higher Yield Stability:** Reduces crop losses due to weeds and insects, improving productivity.
  - **Supports Mechanisation:** Suitable for **large-scale mechanised farming** in regions facing labour shortages.
  - **Farmer Cost Savings:** Reduces input costs on weeding; improves net profitability.
- **Significance:**
  - **Addresses labour shortages** and rising costs of manual weeding in cotton farming.
  - Helps combat **yield stagnation** caused by factors like **Tobacco Streak Virus (TSV)** in Bt cotton areas.
  - Reduces **illegal seed use** and enforces **quality control** through regulated commercial cultivation.

INTERNATIONAL TREATY ON PLANT GENETIC RESOURCES FOR FOOD AND AGRICULTURE (PLANT TREATY)

Context: India has raised objections to proposed amendments to the International Treaty on Plant Genetic Resources for Food and Agriculture (Plant Treaty) at the Peru.

About International Treaty on Plant Genetic Resources for Food and Agriculture (*Plant Treaty*):

- **What is the Plant Treaty?**
  - A **legally binding global agreement** adopted by the **FAO** in **2001**, entered into force in **2004**.
  - India is a **signatory** to the treaty.
  - Linked to the **Convention on Biological Diversity (CBD)** and **FAO's Global Plan of Action**.
- **Objectives:**
  - **Conservation and sustainable use** of plant genetic resources.
  - **Fair and equitable benefit-sharing** from the use of these resources.
  - Ensure **food security** and protect **agrobiodiversity**
- **Key Features of the Treaty:**
  - **Multilateral System (MLS):**
    - Covers **64 food and forage crops** listed in **Annex I** (e.g., rice, wheat, maize, pulses).
    - Facilitates **access to plant genetic materials** among member countries.
    - Ensures **benefit-sharing** through technology transfer, capacity building, and commercial revenue.
  - **Standard Material Transfer Agreement (SMTA):**
    - Legal framework for accessing and exchanging plant genetic materials.
  - **Farmers' Rights (Article 9):**
    - Right to **save, exchange, and sell seeds**.
    - Recognition of **indigenous knowledge** and community contributions.
    - Inclusion in decision-making processes.
  - **Global Information System (Article 17):**
    - Promotes data sharing on plant genetic resources.
- **What is the New Proposal?**
  - The amendments propose **expanding mandatory obligations** under the **Multilateral System (Annex I)**.
  - **All plant germplasm** would have to be shared under **Governing Body-determined SMTA**, **not India's national laws**.
  - Could dilute India's **sovereign rights** and control over indigenous plant varieties.
  - Might undermine **traditional farming practices** and **seed-saving traditions** of smallholders.

Topics: Issues related to direct and indirect farm subsidies and minimum support prices; Public Distribution System- objectives, functioning, limitations, revamping; issues of buffer stocks and food security; Technology missions; economics of animal-rearing.

FOOT AND MOUTH DISEASE (FMD)

Context:

Foot and Mouth Disease (FMD) has been confirmed as the cause behind the death of 16 spotted deer at Rajiv Gandhi Zoological Park, Pune, prompting urgent reviews of epidemic control.

About Foot and Mouth Disease (*FMD*):

- **What is FMD?**
  - Foot and Mouth Disease is a highly contagious viral disease that affects cloven-hoofed animals such as cattle, buffaloes, goats, sheep, pigs, and deer. It causes fever, painful blisters, and lameness, severely impacting animal productivity and economic output.
- **Historical Overview:**
  - **First identified:** In the United States in **1870** and eradicated by **1929**.
  - **Current Status:** Endemic in many parts of **Asia, Africa, and the Middle East**.
  - **Zoonotic Potential:** FMD **does not affect humans** and is not a food safety threat.
- **Transmission and Symptoms:**
  - **Transmission:** Direct contact, contaminated feed, tools, vehicles, and airborne particles.
  - **Vector Hosts:** Cattle, pigs, goats, sheep, deer (like the Pune zoo chitals).
  - **Incubation:** 2–14 days.
  - **Symptoms:**
    - High fever for 2–3 days.
    - Blisters on mouth, tongue, hooves, mammary glands.
    - Excessive salivation and lameness.
    - Low milk yield, abortions, and sterility.
  - **Diagnosis:** Laboratory testing at accredited institutes (e.g., ICAR-NIFMD, Bhubaneswar).
- **Control Measures and Government Interventions:**
  - **National Animal Disease Control Programme (NADCP):**
    - Launched in **2019**, 100% centrally funded.
    - Targets **FMD and Brucellosis** eradication by **2030**.
  - **Integrated with Livestock Health and Disease Control Programme (LHDCP):** Supports vaccination, ear-tagging, disease surveillance, cold chain, and awareness.
  - **Institutional Infrastructure:** ICAR-NIFMD, IVRI Bareilly, NIVEDI Bengaluru conduct vaccine R&D, monitoring, and outbreak reporting.

BIOSTIMULANTS

Context:

Union Agriculture Minister has directed states to **halt forced sales of biostimulants**, amid rising complaints over efficacy and regulatory violations.

- The Centre is tightening oversight on biostimulants through revised specifications and regulatory checks under the Fertiliser Control Order (FCO), 1985.

About Biostimulants:

- **Definition:**
  - Biostimulants are substances or microorganisms that, when applied to plants or soil, enhance nutrient uptake, plant growth, yield, and stress resistance, without being classified as fertilisers or pesticides.
- **Key Characteristics:**
  - **Non-nutrient input:** Unlike fertilisers, they stimulate plant physiological processes.
  - **Derived from nature:** Often made from plant residues, seaweed extracts, or microbes.
  - **Not a pesticide substitute:** They don't directly control pests, and are regulated separately under FCO.
  - **Crop-specific efficacy:** Applied for specific crops like paddy, onion, brinjal, chilli, etc.
- **Regulatory Framework:**
  - **Legal Backing:**
    - Included under **Fertiliser Control Order (FCO), 1985** through an amendment in February 2021.
    - Must comply with toxicity tests, eco-safety trials, and bio-efficacy studies.
  - **Mandatory Testing:**
    - Five **acute toxicity tests** (oral, dermal, inhalation, eye, skin).

- Four **eco-toxicity tests** (on fish, birds, honeybees, and earthworms).
- Trials at **3 agro-ecological zones** over a season, with **3 different doses**.

- **Central Biostimulant Committee:**
  - Constituted in 2021 for 5 years under the **Agriculture Ministry**.
  - Advises on product approvals, testing methods, and lab standards.

- **Government Action & Current Issues**
  - **Misuse reported:** Retailers forcing farmers to buy biostimulants with subsidised fertilisers.
  - **Crackdown on unregistered products:** From 30,000+ unregulated products, only 650 now permitted.
  - **March 2024 deadline lapse:** Provisional licences expired and unsold stocks now ineligible for sale.
  - **Crop-specific specs:** Notified in May 2025 for tomato, chilli, paddy, cotton, soybean, and more.
- **India's Growing Biostimulant Market:**
  - Valued at **USD 410 million in 2025**, projected to reach **USD 1.13 billion by 2032**.
  - Driven by demand for **low-input sustainable agriculture** and climate-resilient practices.

INDIA'S FIRST EQUINE DISEASE-FREE COMPARTMENT (EDFC)

Context: India's first Equine Disease-Free Compartment (EDFC) at the RVC Centre, Meerut, has been officially recognised by the World Organisation for Animal Health (WOAH).

About India's first Equine Disease-Free Compartment (*EDFC*):

- **What is it?**
  - A scientifically managed, internationally recognised zone that ensures horses are free from specified equine diseases, allowing them to participate in global trade and competitions.
- **Established at:** Remount Veterinary Corps (RVC) Centre & College, Meerut Cantonment, Uttar Pradesh
- **Recognised by:** World Organisation for Animal Health (WOAH).
- **Established under:** Ministry of Fisheries, Animal Husbandry and Dairying
- **Key Features of the EDFC**
  - **Disease-Free Status:** Officially declared free from Equine Influenza, Glanders, Surra, Equine Piroplasmosis, and Equine Infectious Anemia. India has also remained free of African Horse Sickness since 2014.
  - **Robust Biosecurity Protocols:** Implements strict Standard Operating Procedures (SOPs) covering hygiene, pest control, animal health surveillance, waste management, and sanitation.
  - **Compartmentalisation Standards:** Follows WOAH's Terrestrial Animal Health Code, maintaining a sub-population of animals with a defined health status.
  - **24/7 Surveillance & Monitoring:** Continuous veterinary screening ensures early detection and containment of infections.
- **Functions:**
  - **Boosts International Trade:** Facilitates export of high-value Indian sport horses compliant with global standards.
  - **Promotes Equestrian Sports:** Enables Indian horses and riders to participate in global equestrian events.
  - **Improves Animal Health Systems:** Demonstrates India's commitment to global biosecurity and science-based animal husbandry practices.
  - **Expands to Poultry Sector:** India is replicating this model for Highly Pathogenic Avian Influenza (HPAI)-Free Compartments to allow safe export of poultry products.

INDIA'S FIRST PRIVATE TEST FACILITY FOR DEPLETED HEAVY WATER UPGRADATION

Context: India's first private test facility for depleted heavy water upgradation has been commissioned by TEMA India Ltd in collaboration with BARC and NPCIL.

About India's First Private Test Facility for Depleted Heavy Water Upgradation:

- **What Is It?**
  - It is a **privately-built test infrastructure** for upgrading **depleted heavy water**, a crucial component used in **Pressurised Heavy Water Reactors (PHWRs)**.
  - Developed by **TEMA India Ltd** under BARC's technology transfer and a purchase order from NPCIL.
- **Location:** The facility is commissioned in **Mumbai, Maharashtra** and is **India's first private sector plant** of its kind in the nuclear domain.
- **Key Features:**
  - **Component Testing:** Specializes in in-house validation of distillation columns and activated phosphor bronze modules used in PHWRs.
  - **BARC Collaboration:** Developed under the guidance and tech transfer from BARC's Chemical Engineering Group.
  - **NPCIL Integration:** Modules tested here will be used in ongoing nuclear energy projects like RAPP-8, GHAVP 1–4, and KAIGA 5–6.
  - **State-of-the-Art Equipment:** Enables testing of critical equipment that was earlier possible only in public-sector BARC facilities.
  - **Indigenous Manufacturing:** Reduces dependency on foreign testing infrastructure and equipment.
- **Strategic Significance:**
  - **Energy Security:** Enhances India's ability to meet its nuclear energy targets using domestic technology and resources.
  - **Public–Private Partnership:** Sets a new benchmark for collaboration between private firms and state-run nuclear bodies.
  - **Export Potential:** Builds technical competence in nuclear manufacturing that can be scaled for global markets.

E10 SHINKANSEN BULLET TRAIN

Context: India and Japan have jointly announced the introduction of the E10 Shinkansen trains on the Mumbai-Ahmedabad bullet train corridor.

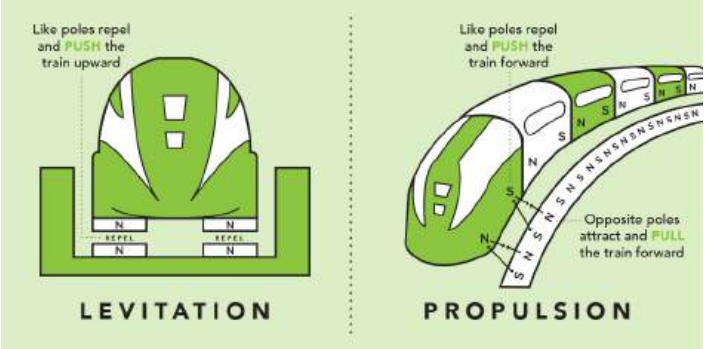
- The **first phase of tunnelling** for the 21-km undersea section between BKC and Thane has been successfully completed.

About E10 Shinkansen Bullet Train:

- **What is E10 Shinkansen?**
  - The **E10 Shinkansen** is Japan's next-generation high-speed bullet train being developed to replace the older E2 and E5 series.
  - Designed by **East Japan Railway Company (JR East)** in partnership with UK-based design firm **Tangerine**.
- **Design & Inspiration:**
  - Inspired by **cherry blossom petals**, featuring a flowing green aesthetic with "Tsugaru Green" and "Evening Elm" shades.
  - Designed to integrate nature and technology, mirroring **Tohoku region's landscape**.
- **Key Features:**
  - **L-shaped guides** to prevent derailment during earthquakes.
  - **Lateral dampers** and **advanced brakes** to reduce shaking and shorten stopping distances.
  - **Blowerless induction motor** to reduce maintenance and enhance energy efficiency.
  - **Autonomous-ready design**, with flexible space for cargo transport in future.
  - Spacious **two-seat-per-row** configuration for comfort.
- **India-Japan Collaboration: Mumbai–Ahmedabad High-Speed Rail (MAHSR)**
  - India to be the **first country outside Japan** to adopt E10 Shinkansen.
  - Tunnel between **BKC and Thane (21 km)** includes India's **first undersea rail tunnel**, now partially completed.
  - Japan provides **funding, tech expertise**, and rolling stock; India manages execution via NHSRCL.
  - Completion targeted by **2030**, with infrastructure, viaducts, and station construction in rapid progress.

HIGH-SPEED MAGLEV TRAIN

Context: China unveiled a new high-speed Maglev train that can cover 1,200 km (Beijing–Shanghai) in just 2.5 hours, outperforming even airplanes.



About High-Speed Maglev Train:

- **What is a Maglev Train?**
  - Maglev (Magnetic Levitation) train is a **wheel-less rail vehicle** that levitates using magnetic force, eliminating friction and enabling high-speed, smooth transport.
- **Concept and Development:**
  - **Inventors:** Conceptualized by **Robert Goddard** and **Emile Bachelet** in the early 1900s.
  - **First Use:** Commercially launched in **1984** in the UK and now operating in China, Japan, and South Korea.
- **How Maglev Works?**
  - **Magnetic Suspension:** Opposing magnetic forces lift the train off the track (no wheel contact).
  - **Propulsion via Magnetic Coils:** Alternating electric current in the guideway changes magnetic polarity to push or pull the train.
  - **Two Systems:**
    - **EMS (Electromagnetic Suspension)**: Uses magnetic attraction.
    - **EDS (Electrodynamic Suspension)**: Uses magnetic repulsion with superconductors.
- **Key Features:**
  - **Speed:** Reaches up to **600 km/h** and accelerates in just **7 seconds**.
  - **Design:** Sleek, aerodynamic nose inspired by **kingfisher birds** for low air resistance.
  - **Ride Quality:** Frictionless, silent, and vibration-free.
  - **Safety:** Highly stable with **low derailment risk**.
  - **Energy Efficiency:** Consumes less operational energy than conventional railways.
- **Significance:**
  - **Airport Alternative:** Offers a greener and faster option for medium-distance routes.
  - **Boosts Innovation:** Integrates superconductors and vacuum tubes for future hyperloop-type systems.
  - **Strategic Leverage:** Strengthens China's global edge in advanced transportation technologies.
- **Limitations:**
  - **High Infrastructure Cost:** Requires entirely new guideways incompatible with existing rail networks.
  - **Rare-Earth Dependence:** Uses costly elements (e.g., Neodymium, Dysprosium) for high-powered magnets.
  - **Limited Network Reach:** Mostly operates on short to medium stretches; not yet widespread.

FUEL CONTROL SWITCHES

Context:

The Air India Flight AI171 crash investigation revealed that both engines of a Boeing 787-8 shut down moments after take-off due to an abrupt movement of fuel control switches to the "CUTOFF" position, triggering loss of thrust and a fatal crash.

About Fuel Control Switches:

- **What Are Fuel Control Switches?**
  - Fuel control switches are cockpit levers that regulate the **flow of fuel to each engine**, enabling engine start-up, shutdown, and emergency actions.
  - On Boeing 787-8 aircraft, these are placed just **below the thrust levers**, one for each engine.
  - **Design:** They are **spring-loaded** and feature a **pull-to-unlock mechanism**, ensuring deliberate and intentional use.
  - **Positions:**
    - **RUN**: Enables normal fuel flow to the engine.
    - **CUTOFF**: Halts fuel supply, shutting down the engine immediately.

- **Fuel Control Switches Working:**
  - **Startup Sequence:** During engine start, pilots first activate a start selector, followed by moving the fuel control switch to RUN, initiating combustion.
  - **Normal Operation:** In-flight, switches remain on RUN and any movement to CUTOFF cuts fuel and power to the engine.
  - **Emergency Use:** In-flight faults may require a manual CUTOFF to shut down a failed engine and the system can attempt automatic engine relight when returned to RUN.
  - **Fail-safe Mechanism:** The switches are connected to redundant power circuits, and valves are designed to close automatically during power loss for safety.
- **Key Features and Safety Design:**
  - **Deliberate Action Required:** A pilot must **lift the switch** before toggling, reducing accidental movement risk.
  - **Visual Alerts:** In emergencies, **red lights illuminate** the affected switch for clear cockpit visibility.
  - **System Redundancy:** Each switch has independent wiring and backup power to prevent simultaneous failure.

AI-POWERED MACHINE VISION-BASED INSPECTION SYSTEMS (MVIS)

Context:

Indian Railways and DFCCIL have signed an MoU to deploy AI-powered Machine Vision-Based Inspection Systems (MVIS) for real-time detection of rolling stock defects.

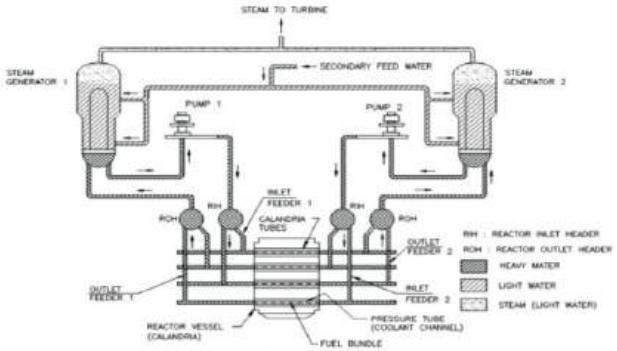
About AI-powered Machine Vision-Based Inspection Systems *(MVIS):*

- **What is MVIS?**
  - MVIS is an **AI–ML integrated visual inspection platform** developed to monitor and detect defects in **freight train rolling stock** using high-resolution cameras and computer vision.
  - It automates inspection, enhances maintenance efficiency, and reduces the risk of accidents.
- **Developed by:** DFCCIL in collaboration with **IISc Bengaluru** and start-up **L2M**.
- **Objectives of MVIS:**
  - Detect **abnormal hanging parts**, broken springs, missing bolts, EM pad damage, hot axles, etc.
  - Provide **real-time alerts** to prevent accidents and service delays.
  - Replace manual inspection with an **automated, accurate, and fatigue-free system**.
  - Enable **preventive maintenance** to reduce cascading failures in rail operations.
- **How MVIS Works?**
  - **High-Speed Cameras (Area & Line Scan):** Mounted on trackside to capture images of moving trains at speeds up to 100 km/h.
  - **AI/ML-Powered Analysis:**
    - Uses **YOLOv8 & CNN models** to detect and classify components as defective or non-defective.
    - **OCR integration** for wagon number detection.
  - **Data Processing Units (DPUs):** Process real-time footage; synchronized with **NTP servers** to avoid timestamp mismatches.
  - **GUI Dashboard:** Cloud-based portal for defect reports, train-wise metrics, and maintenance action logs
- **Key Features of MVIS:**
  - **Multi-camera configuration** (upper, lower, undercarriage) to capture all critical components.
  - **Monochrome cameras** used for faster processing and better clarity in defect detection.
  - **LED Lighting** ensures proper imaging in day-night and poor visibility conditions.
  - **Real-time alerting system** enables immediate remedial action by maintenance teams.
  - **Scalable architecture** to handle large data, train formations, and national deployment.

PRESSURISED HEAVY WATER REACTORS

Context:

The Atomic Energy Regulatory Board (AERB) has granted operational licences to NPCIL for two indigenous 700 MWe Pressurised Heavy Water Reactors (PHWRs) at Kakrapar Atomic Power Station (Units 3 & 4) in Gujarat.



1. Flow diagram of PHWR

About Pressurised Heavy Water Reactors:

- **What is a PHWR?**
  - A **nuclear fission reactor** that uses **natural uranium** as fuel and **heavy water (D_2O)** as both coolant and neutron moderator.
  - Designed to operate with **online refuelling**, allowing continuous energy production.
- **Developed By:**
  - Initially with Canadian support (Rajasthan-1), later fully **indigenised by BARC** (Bhabha Atomic Research Centre) and **NPCIL (Nuclear Power Corporation of India Ltd)** under the **Department of Atomic Energy**.
- **Historical Evolution:**
  - **RAPS-1 (1973):** With Canadian collaboration.
  - **RAPS-2 onwards:** Entirely developed by Indian scientists post-AECL withdrawal.
  - Progression from **220 MWe → 540 MWe → 700 MWe** with full domestic R&D and manufacturing.
- **How Does It Work?**
  - Uses **heavy water as moderator** to slow down neutrons and maintain a sustained chain reaction.
  - **Fuel rods** (natural uranium) are inserted into **pressure tubes** within a **calandria vessel**.
  - **Hot pressurised heavy water** carries heat to steam generators → drives turbines → generates electricity.
  - **Control rods and ECCS systems** regulate power output and enhance safety.
- **Key Features of 700 MWe PHWRs:**
  - **Fully indigenous design and operation**, including construction, fuel fabrication, and control systems.
  - **Online refuelling system** improves efficiency and reduces downtime.
  - Equipped with **twin fast-acting shutdown systems**, **double containment**, and passive heat removal.
  - **Digital Instrumentation and Control Systems** enhance real-time safety and automation.
  - **On-site heavy water moderation and cooling** reduces external dependency and enriches neutron economy.
- **Significance of Recent Licence:**
  - Boosts India's **10-reactor PHWR fleet mode rollout**, part of its strategy to add **7000 MWe capacity** indigenously.
  - Confirms that India has **mastered end-to-end nuclear tech** from design to decommissioning.

ALUMINIUM VISION DOCUMENT

Context: Union Coal and Mines Minister unveiled the Aluminium Vision Document at the International Conference on Sustainable and Responsible Mining in Hyderabad to position India as a global aluminium production hub by 2047.

About Aluminium Vision Document:

- **What is it?**
  - A strategic policy roadmap to transform India's aluminium industry for self-reliance, clean energy transition, and global competitiveness.
- **Published by:** Ministry of Coal and Mines, Government of India.
- **Aim:** To scale up aluminium production sustainably and make India a leading global player in green aluminium
- **Key Features of the Vision Document**
  - **Massive Production Expansion:** Targets a six-fold increase in aluminium production capacity by 2047 to meet future strategic and economic demands.
  - **Boost to Raw Material Base:** Aims to expand bauxite production capacity to 150 MTPA, ensuring long-term raw material security.
  - **Circular Economy Push:** Plans to **double India's aluminium recycling rate**, reducing dependency on primary raw materials.
  - **Green Technology Adoption:** Focus on low-carbon, energy-efficient technologies to align with net-zero goals and sustainable development.
  - **Policy and Institutional Reforms:** Proposes targeted reforms for smoother mining approvals, faster project clearances, and better resource governance.

- **Strategic Relevance:** Aluminium identified as a critical mineral vital for clean energy (solar, wind), EVs, defence, and infrastructure.

- **Significance of the Vision Document:**
  - **Clean Energy Transition:** Supports India's decarbonisation efforts by promoting aluminium as a lightweight, recyclable green metal.
  - **Economic Growth Driver:** Enhances industrial output, exports, and job creation across the aluminium value chain.
  - **Technological Innovation:** Encourages R&D for advanced smelting technologies and digitisation of aluminium production processes.
  - **Atmanirbhar Bharat Vision:** Reinforces self-reliance by reducing import dependency and making India a global manufacturing hub.
  - **Environmental Leadership:** Positions India as a champion of **responsible mining** and green aluminium economy.

SOLAR ENERGY CORPORATION OF INDIA (SECI)

Context:

The Solar Energy Corporation of India (SECI) has successfully executed over 60 GW of Power Sale Agreements (PSAs) for solar, wind, and hybrid energy projects.

About Solar Energy Corporation of India *(SECI)*:

- **What is SECI?**
  - SECI is a **Central Public Sector Undertaking (CPSU)** under the Ministry of New and Renewable Energy (MNRE). It serves as a nodal agency for implementing India's renewable energy initiatives.
- **Established:** **2011**, to implement the **National Solar Mission** **(NSM)**.
- **Aim:**
  - SECI was initially focused only on solar energy.
  - SECI's scope has expanded to cover the **entire renewable energy spectrum**, and it will soon be renamed **Renewable Energy Corporation of India** **(RECI)**.
- **Functions and Roles**
  - **Power Sale Agreements (PSAs):** SECI provides long-term power purchase guarantees to developers, boosting investor confidence in RE ventures.
  - **Implementing Govt Schemes:** Manages key schemes such as the Viability Gap Funding (VGF), solar parks, rooftop solar, solar canals, and defence & border projects.
  - **Innovative Models:** Pioneers hybrid RE solutions like solar-wind combos, Round-the-Clock (RTC) power, and Firm & Dispatchable RE (FDRE) projects.
  - **Project Development:** Acts as turnkey developer for PSUs, expanding RE reach to diverse sectors.
  - **Power Trading:** Operates with a power trading license to sell solar power from implemented schemes.
  - **Mission-Driven:** Aims to democratize clean energy access, enhance grid reliability, and create a low-carbon economy through scalable RE models.
- **Significance of the 60 GW PSA Milestone:**
  - **Capital Infusion:** Guarantees secure offtake and encourages large-scale private and public investments in RE.
  - **Market Expansion:** Enhances RE adoption among states by offering customized power solutions based on regional needs.
  - **Navratna Status (2024):** SECI can now independently invest up to ₹1,000 crore, fast-tracking green infrastructure without central approval.

RAILONE APP

Context:

The Union Railway Minister launched the RailOne App, during the 40th Foundation Day of CRIS. The app aims to streamline and digitize passenger services across Indian Railways.

About *R*ailOne App*:*

- **What is RailOne?**
  - RailOne is an **all-in-one mobile application** for Indian Railways passengers, offering

integrated services through a single platform.

- **Developed By:** Centre for Railway Information Systems (CRIS), under the Ministry of Railways.
- **Objective:** To enhance digital interface, offer seamless access to rail services, and reduce dependency on multiple apps.
- **Key Features of RailOne App:**
  - **Integrated Passenger Services**: Combines unreserved ticket booking (UTS), live train tracking, e-catering, porter services, and last-mile taxi booking.
  - **Digital Ticketing:** Unreserved UTS tickets through **R-Wallet** offer a **3% discount**.
  - **Unified Login:** Uses **single sign-on** via mPIN, biometric, and supports existing UTS/ RailConnect credentials.
  - **Space-Saving App:** Eliminates the need to install multiple railway apps.
  - **Grievance Redressal:** Easy lodging and tracking of complaints for better passenger support.
  - **Authorised by IRCTC:** Similar to other commercial apps integrated with the official ticketing system.
- **Future Vision – Upgraded PRS System:**
  - **Launch by December 2025:** A modern, multilingual, scalable Passenger Reservation System (PRS) is under development.
  - **Advanced Capabilities:** Handles 1.5 lakh ticket bookings and 40 lakh enquiries/min.
  - **Inclusive Design:** Features for Divyangjan, students, and patients, with seat choice and fare calendar.

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

A NEW HUMAN BLOOD GROUP—CRIB

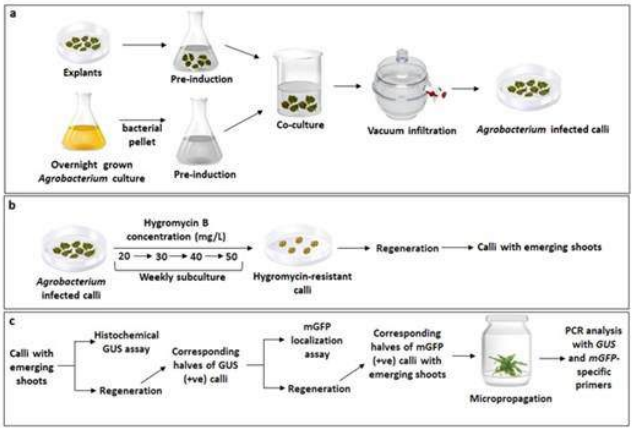
Context: A new human blood group—CRIB—has been discovered at the Rotary Bangalore TTK Blood Centre. It is the first of its kind globally, officially recognised by the International Blood Group Reference Laboratory (IBGRL), UK.

About A new human blood group—CRIB:

- **What is CRIB Blood Group?**
  - **CRIB** stands for **Cromer India Bengaluru**.
  - It is a **new antigen** identified within the **Cromer (CR) blood group system**, not previously observed in any human sample worldwide.
  - Discovered in a **38-year-old South Indian woman** undergoing cardiac surgery in Kolar, Karnataka.
- **How was it Identified?**
  - The woman's blood tested **panreactive**—meaning it reacted with all tested samples and was **incompatible** even with O+ blood.
  - No compatible match was found among **20 family members** tested.
  - Sample was sent to **IBGRL, UK**, where after **10 months of molecular analysis**, the **new antigen was confirmed** and officially named **CRIB**.
- **Scientific Significance:**
  - CRIB is now a **new entry in global transfusion medicine**.
  - Named using standard ISBT nomenclature.
  - Adds to India's contribution in **rare blood immunogenetics**.
  - Highlights the **need for rare donor registries** and **global collaboration** in blood typing.
- **What is the Cromer Blood Group System?**
  - **Cromer system** is a rare blood group classification involving antigens located on the **DAF (Decay-Accelerating Factor)** protein on red cells.
  - These antigens are important in **immune reactions** during transfusion.

A FUNGUS FIGHTING PINEAPPLE

Context: Indian researchers at Bose Institute have developed a fungus-resistant pineapple by overexpressing the **AcSERK3 gene**, offering a sustainable solution **against Fusariosis**, a devastating fungal disease.



About A Fungus Fighting Pineapple:

- **What is it?**
  - A genetically modified pineapple variety engineered to resist **Fusarium moniliforme**, a fungus causing **Fusariosis**, which destroys stems, leaves, and fruits.
  - Developed by **Bose Institute (DST)** scientists **Prof. Gaurab Gangopadhyay** and **Dr. Soumili Pal**.
- **Threat of Fungal Disease to Pineapple:**
  - **Fusariosis** leads to **stem warping, blackened leaves, and internal fruit rot**, causing heavy crop losses.
  - Traditional breeding methods struggle to counter fast-evolving fungal strains.
- **How the Antifungal Pineapple Was Developed?**
  - Scientists **overexpressed the AcSERK3 gene**, enhancing the plant's natural defence mechanisms.
  - **Agrobacterium-mediated transformation** was used to insert the gene into pineapple explants.
  - Transgenic plants showed **higher stress tolerance and enzyme activity**, resisting fungal attacks.
- **Key Features:**
  - **Enhanced disease resistance**: Stronger defence against Fusarium.
  - **Stable genetic trait**: Low risk of gene deletion over generations.
  - **Sustainable farming**: Reduces reliance on chemical fungicides.
- **Significance:**
  - **First documented case** of **overexpressing an inherent gene** for fungal resistance in pineapples.
  - Potential for **multi-fungal resistant varieties** through long-term field trials.

NUCLEAR MEDICINE USING RADIOACTIVE IODINE

Context: Nuclear medicine using radioactive iodine (^{131}I) is gaining prominence in India as a non-invasive, effective treatment for thyroid disorders and differentiated thyroid cancers.

About Nuclear medicine using radioactive iodine:

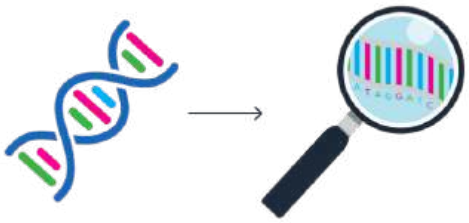
- **What It Is?**
  - Radioactive iodine therapy (RAI) uses isotopes like iodine-131 (^{131}I) to diagnose and treat overactive thyroid glands and thyroid cancers. It forms a core part of nuclear medicine's theranostic approach (therapy + diagnostics).
- **Discovery & Development:**
  - First proposed in 1936 by **Saul Hertz**, following a lecture at MIT by Karl Compton.
  - **Iodine-131** was discovered by **Glenn Seaborg and John Livingood** in 1938 at UC Berkeley.
  - Marked the **beginning of nuclear medicine**, integrating physics and biology.
- **How It Works?**
  - Patients ingest a **capsule or liquid** form of radioactive iodine.
  - The **hyperactive thyroid tissue** absorbs the iodine.
  - The emitted **beta particles destroy thyroid cells**, reducing hormone production.
  - **Gamma rays** allow imaging to track progress.
- **Key Features:**
  - **Precise targeting:** Radioactive iodine is absorbed only by thyroid cells, sparing healthy tissue from exposure.
  - **Minimally invasive:** The therapy involves swallowing a capsule or liquid—no surgical procedure is needed.
  - **Safe & regulated:** Treatment is administered in specialized wards under strict radiation safety norms.
  - **Customisable doses:** Dosage varies from mild for hyperthyroidism to high for thyroid cancer ablation.
  - **Contraindicated in pregnancy:** Pregnant or nursing women are excluded to avoid fetal radiation exposure.
- **Significance:**
  - **First-line treatment for hyperthyroidism:** Conditions like Grave's disease and toxic goitre respond well to RAI. It lowers hormone levels effectively without surgery.
  - **Essential for thyroid cancer follow-up:** Post-surgical patients use it to destroy residual or metastatic thyroid tissue. It ensures long-term remission and reduces recurrence risks.
  - **Cost-effective and widely available:** RAI is affordable and accessible in many

Indian public and private hospitals.

GUJARAT LAUNCHES INDIA'S FIRST TRIBAL GENOME SEQUENCING PROJECT

Context:

Gujarat became the first Indian state to launch a Tribal Genome Sequencing Project to build a reference genetic database aimed at improving healthcare access for tribal populations.

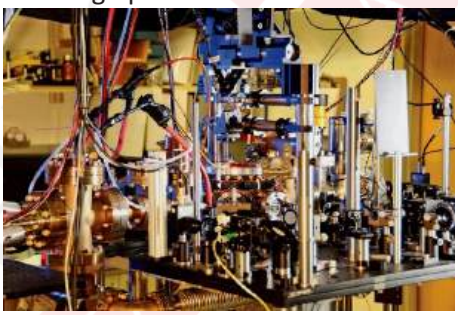


About Gujarat Launches India's First Tribal Genome Sequencing Project:

- **What It Is?**
  - A pioneering genomic research initiative to sequence the genomes of 2,000 tribal individuals across 17 districts of Gujarat to enhance precision medicine.
- **Launched By:** Implemented by the **Gujarat Biotechnology Research Centre (GBRC)**.
- **Objectives:**
  - To identify **genetic risk markers** linked to **inherited disorders** like:
    - Sickle cell anaemia
    - Thalassemia
    - Hereditary cancers
  - To develop personalised healthcare protocols based on tribal genetic profiles.
  - To bridge the health equity gap using science-led tribal empowerment.
- **Key Features:**
  - Involves **advanced infrastructure** for sample collection, sequencing, and data analysis.
  - Focus on **natural immunity markers** and **customised medical care**.
  - Engagement with tribal communities for **inclusive consultation** and awareness.
  - Covers **diverse tribal groups** from **17 districts** to ensure representation and diversity.
- **Significance:**
  - **Healthcare Equity:** Enables early detection and tailored treatment for genetic diseases in underserved communities.
  - **Data-Driven Public Health:** Establishes a baseline genomic database for long-term health research and policy planning.
  - **National Replicability:** Serves as a model for other Indian states to follow in building region-specific genomic policies.

OPTICAL ATOMIC CLOCK

Context: An international team of 65 scientists successfully conducted the largest optical clock comparison across three continents, paving the way to redefine the SI unit of time — the second — using optical atomic clocks.



About Optical Atomic Clock:

- **What is an Optical Atomic Clock?**
  - An **optical atomic clock** is a next-generation timekeeping device that uses light waves from atoms (in the optical frequency range) instead of microwaves (as in caesium clocks) to measure time with ultra-high precision.
- **Materials Used:**
  - Strontium-87 (Sr), Ytterbium-171 (Yb), Ytterbium ions (Yb^+ E2, Yb^+ E3), Strontium, 88 ions (Sr^+), and Indium-115 ions (In^+).
  - These atoms and ions are chosen for their **stable electronic transitions**, critical for accurate frequency measurement.
- **Objective of Optical Clocks:**
  - To **replace caesium-based atomic clocks** as the new international standard for defining the second.
  - To **support high-precision applications** in GPS, climate science, space navigation, and radio astronomy.
  - To **improve global time synchronization** with enhanced stability and reliability.
- **How Does It Work?**
  - Atoms are held in an **optical lattice** or ion trap and are stimulated by a **laser tuned to a specific optical frequency**.
  - When the atom absorbs and emits this energy, it oscillates at a consistent and ultra-fast rate — **hundreds of trillions of times per second (Hz)**.
  - The clock counts these light-wave oscillations to define "one second" with **18-decimal-**

place accuracy.
    - Backup systems (like GPS-based clocks) maintain continuity during maintenance breaks.
- **Why Optical Clocks Are Superior to Caesium Clocks?**
    - **Greater Frequency:** Optical transitions use light waves (~10^{15} Hz), which are 10,000 times faster than microwave transitions in Cs clocks (~10^{9} Hz).
    - **Higher Stability:** Some optical clocks lose just **1 second in 15 billion years**.
    - **Better Precision:** Measurements consistent across nations within **10^{-16} to 10^{-18} range**.
    - **More Reliable Timekeeping:** Essential for quantum tech, deep space missions, and Earth observation.
- **Global Relevance:**
    - Institutions from Germany, France, Japan, Italy, Finland, and the UK took part in the 45-day experiment using advanced **optical fibre links and GPS precision techniques**.
    - Findings identified both synchrony and system errors, ensuring transparency for future standard-setting.
    - By 2030, these optical clocks are expected to **officially redefine the SI second**, revolutionizing global timekeeping.

EXTENDED RANGE ANTI-SUBMARINE ROCKET (ERASR)

Context:
India conducted successful user trials of the Extended Range Anti-Submarine Rocket (ERASR) from INS Kavaratti, demonstrating its enhanced underwater strike capabilities.

About Extended Range Anti-Submarine Rocket (ERASR):

- **What is ERASR?**
    - The **Extended Range Anti-Submarine Rocket (ERASR)** is a state-of-the-art underwater weapon system developed indigenously by DRDO to target hostile submarines.
    - It can be launched from Indian naval warships equipped with **Indigenous Rocket Launchers (IRLs)**.
- **Developed by:** Developed by Defence Research and Development Organisation (DRDO).
- **Objective:** To equip Indian naval forces with **long-range, high-precision capability** to neutralize underwater threats using indigenous technology and reduce reliance on foreign defence imports.
- **Key Features of ERASR:**
    - **Twin Rocket Motor System:** Allows engagement of both short- and long-range underwater targets effectively.
    - **Electronic Time Fuze:** Designed entirely in India, ensuring precise timed detonation upon nearing submarine threats.
    - **High Operational Accuracy:** Proven consistency in performance under real maritime warfare conditions.
    - **Warhead Reliability:** Warheads detonated successfully in all trial scenarios, confirming battlefield readiness.
    - **Compatible Launch Platforms:** Can be fired from frontline warships using Indian-made rocket launchers.
- **Highlights from the Sea Trials:**
    - A total of **17 rockets** were tested from **INS Kavaratti** under simulated combat conditions.
    - Trials evaluated:
        - Range precision
        - Fuze timing reliability
        - Warhead detonation effectiveness
    - Indian Navy confirmed all performance objectives were achieved.
- **Significance of ERASR:**
    - **Strengthens Indian Navy's ASW capabilities** in the Indian Ocean Region.
    - **Promotes Atmanirbharta (self-reliance)** in high-tech defence manufacturing.
    - **Efficient use of defence budget** by replacing costly imports with scalable domestic systems.
    - **Reflects DRDO's innovation** in producing battle-ready technologies suited to Indian maritime needs.

INDIGENOUS ADVANCED TOWED ARTILLERY GUN SYSTEM (ATAGS)

Context:
The Indian Army is set to induct its first regiment of indigenous Advanced Towed Artillery Gun System (ATAGS) after successful trials, marking a major leap in artillery modernization.

About Indigenous Advanced Towed Artillery Gun System (*ATAGS*):

- **What it is?**
  - **ATAGS** is a **155mm/52 calibre long-range towed artillery gun** system designed for precision firepower.
  - It is part of a mission to **replace ageing artillery** in the Indian Army with modern, high-performance guns.
- **Developed by:**
  - Defence Research and Development Organisation (DRDO) in collaboration with Tata Advanced Systems Ltd and Bharat Forge Ltd under Make in India.
- **Objective:**
  - To **develop a futuristic artillery platform** capable of high-mobility, rapid deployment, and long-range accuracy for battlefield superiority.
- **Key Features:**
  - **Firing Range**: Proven capability of up to **48 km**.
  - **Deployment Time:** Can be operational within **90 seconds**.
  - **Firing Modes:** Burst, Intense, and Sustained fire.
  - **Automation:** Fully **electric drive** system replacing traditional hydraulics for better field reliability.
  - **Handling System:** Includes **automatic ammunition loading** and **onboard crane**.
  - **Precision and Lethality:** Wider firing arc for enhanced destructive coverage.
  - **Indigenous Content:** Over **80% components sourced domestically**.
- **Significance:**
  - Marks a major step in **self-reliant defence manufacturing**.
  - Strengthens India's capability for **long-range and precision artillery warfare**.
  - Reduces dependence on foreign defence imports.
  - Enables "**shoot and scoot**" tactics with next-gen **Mounted Gun System (MGS)** variant.

ACCELERATOR MASS SPECTROMETRY (AMS) DATING

Context: The Tamil Nadu State Department of Archaeology (TNSDA) has sent 23 charcoal samples from 7 excavation sites for Accelerator Mass Spectrometry (AMS) Dating to the Beta Analytic Laboratory in the U.S.

About Accelerator Mass Spectrometry (AMS) Dating:

- **What is AMS Dating?**
  - A **precise radiocarbon dating technique** that identifies the **ratio of Carbon-14 isotopes** in archaeological materials.
  - Unlike conventional radiometric methods, AMS counts **individual atoms** rather than detecting decay.
- **Objectives:**
  - To determine the **age of ancient materials** with **high precision**.
  - To enable dating with **very small sample sizes** (as low as 20 mg).
  - To support **non-destructive analysis** of rare artifacts.
- **How AMS Works?**
  - **Sample Preparation:** Material is converted to **graphite** after chemical pretreatment.
  - **Ionization:** A cesium beam bombards the graphite, creating **negatively charged carbon ions**.
  - **Acceleration:** Ions are accelerated using **tandem electrostatic accelerators**.
  - **Stripping & Detection:**
    - Ions pass through a **stripper** to become **positively charged**.
    - Magnetic fields separate isotopes (**C-12, C-13, C-14**) based on mass.
    - **C-14 atoms are counted** to determine age.
- **Key Features:**
  - **High Precision:** Achieves lower background noise and higher accuracy.
  - **Minimal Sample Size:** Requires **1,000x less sample** than traditional methods.
  - **Faster Turnaround:** Results within hours vs days in radiometric techniques.
  - **Less Destructive:** Ideal for precious or tiny

archaeological samples.
    - **High Sensitivity:** Detects trace levels of C-14, even in blood or seeds
- **Applications:**
    - **Archaeology:** Dating of wood, charcoal, bones, potsherds.
    - **Geology & Oceanography:** Sediment analysis, ocean carbon maps.
    - **Biomedical Research:** Drug tracing, microdosing studies.
    - **Climate Science:** 3D carbon isotope mapping of marine systems.

RESEARCH DEVELOPMENT AND INNOVATION (RDI) SCHEME

Context: The Union Cabinet has approved the Research Development and Innovation (RDI) Scheme with a ₹1 lakh crore corpus to catalyze private sector investment in research, development, and innovation.

About Research Development and Innovation (RDI) Scheme:

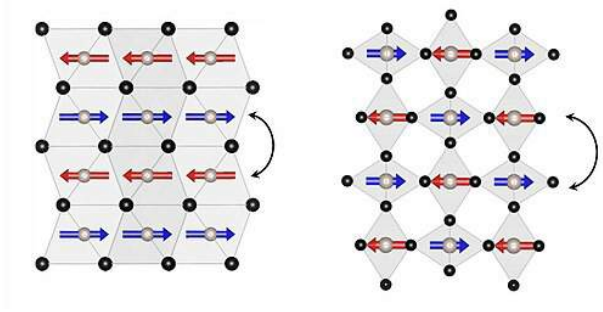
- **What is the RDI Scheme?**
    - The RDI Scheme is a long-term financial support initiative launched by the Government of India to scale up private sector participation in high-end research, innovation, and technology commercialisation.
- **Nodal Ministry:** Department of Science and Technology (DST)
- **Strategic Direction**: Anusandhan National Research Foundation (ANRF), chaired by the Prime Minister
- **Policy Oversight:** Empowered Group of Secretaries (EGoS) led by Cabinet Secretary
- **Objectives:**
    - Scale up **R&D and innovation** in private sector across sunrise and strategic domains
    - Encourage development of high-TRL (Technology Readiness Level) projects
    - Support acquisition and domestic development of **critical technologies**
    - Establish a dedicated **Deep-Tech Fund of Funds** to support frontier technologies
- **Key Features of the RDI Scheme:**
    - **Large-Scale Fund Corpus:** ₹1 lakh crore has been allocated to provide affordable finance for innovation in strategic and sunrise sectors.
    - **Two-Tiered Financing Mechanism:** Funds will flow from a Special Purpose Fund under ANRF to second-level fund managers for targeted project support.
        - **Tier-1:** Special Purpose Fund under ANRF
        - **Tier-2:** Allocation to second-level fund managers
    - **Low/Nil Interest Loans:** Private firms will get long-term loans at minimal or zero interest, easing capital constraints in R&D.
    - **Equity and Risk Capital Support:** Startups and MSMEs can access equity investments, promoting innovation with lower risk exposure.
    - **Support for TRL Projects:** Projects with higher Technology Readiness Levels (TRLs) will be prioritised to fast-track market readiness.
    - **Deep-Tech Fund of Funds (FoF):** A dedicated FoF will support high-tech areas like AI, semiconductors, quantum, and biotech sectors.
    - Technology Acquisition **Support:** Supports procurement of critical foreign technologies to enhance national capability and self-reliance.
- **Significance:**
    - **Promotes Atmanirbharta:** Critical in defence tech, electronics, clean energy.
    - **Reduces R&D Credit Gap:** Provides capital where private sector hesitates due to risk.

Drives Deep-Tech Innovation: Supports ventures in areas critical to national growth.

ALTERMAGNET

Context: Scientists at the S.N. Bose National Centre for Basic Sciences have discovered a rare direction-dependent conduction polarity (DDCP) in Chromium Antimonide (CrSb), a newly discovered altermagnet.

- This is the **first known altermagnet** to show both **p-type and n-type conduction** within a single crystal based on direction



About Altermagnet:

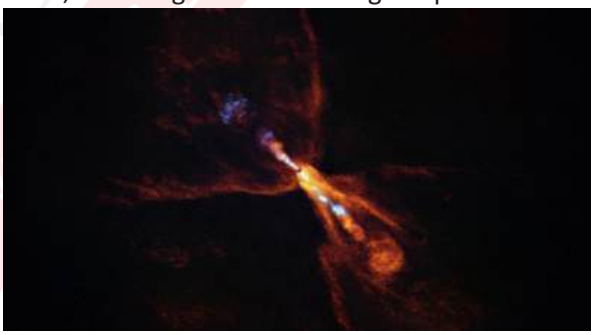
- **What are Altermagnets?**
  - **Altermagnets** are a novel class of magnetic materials that combine the internal spin ordering of antiferromagnets with the functional advantages of ferromagnets, yet exhibit zero net magnetization externally.
  - Their **hidden magnetic symmetry** enables unique control over electron spin and transport without external magnetic signatures.
- **Discovered By:** This specific behaviour in **CrSb** was discovered by **S.N. Bose National Centre for Basic Sciences**, under the Department of Science and Technology, Government of India.
- **Key Characteristics:**
  - **Zero Net Magnetism:** Despite magnetic ordering, they show no external magnetic field like regular magnets.
  - **High Spin Splitting:** Internal electron spin energy levels differ greatly—30× room temperature in CrSb.
  - **High Thermal Stability:** CrSb remains magnetic at temperatures twice that of room temperature, making it viable for industrial electronics.
  - **DDCP (Direction-Dependent Conduction Polarity):** CrSb shows n-type behaviour along layers and p-type behaviour across layers, a first among known magnetic materials.
  - **Single-Crystalline Purity:** High-quality crystals allow precise measurement of anisotropic conduction.
- **How it Happens?**
  - In **CrSb**, when electric current flows within the crystal layers, electrons carry charge (n-type).
  - When current flows across the layers, holes (absence of electrons) take over (p-type).
  - This unusual conduction behaviour arises from asymmetric spin and charge distribution in the crystal structure.
- **Applications:**
  - **Spintronics:** Enables manipulation of electron spin rather than charge, paving the way for ultra-fast, low-energy memory devices.
  - **Compact Electronics:** Acts as both **p-type and n-type**, removing the need for separate materials or doping.
  - **Thermoelectric:** Enhances energy efficiency in power conversion systems.
  - **Simplified Manufacturing:** Obviates heterostructures or junctions, reducing cost and complexity.
  - **Sustainable Tech:** CrSb is **non-toxic and earth-abundant**, aligning with green electronics initiatives.

Topics: Awareness in space.

STAR - HOPS315

Context:

Astronomers have, for the first time, captured the condensation of solid rock from vapor around a newborn star — HOPS315 — using the James Webb Space Telescope and ALMA, revealing the earliest stage of planet formation.



About Star - HOPS315:

What is HOPS315?

- **Newborn Protostar:** HOPS315 is a young, still-forming star located in the Orion molecular cloud, surrounded by a dense **protoplanetary disc** of gas and dust.
- **Tilted Disc Advantage:** Its disc is uniquely inclined, allowing Earth-based telescopes a rare view deep into its planet-forming interior.
- **Key Observations:**
  - **James Webb Space Telescope (JWST)** detected strong silicon monoxide gas emissions (~470 K) and crystalline silicates within **2.2 AU** of the star — the region where rocky planets may eventually form.
  - **ALMA** identified cooler surrounding gases and confirmed the **absence of slow-moving SiO**, indicating the crystals were embedded in the rising disc atmosphere rather than in stellar outflows.
- **Crystallisation Process:** At around **1 AU** from HOPS315, computer simulations and real data

suggest **dust vaporised at ~1300 K**, then re-condensed into minerals like **forsterite, enstatite**, and **silica** — similar to those in ancient Earth meteorites.

- **First-Ever Direct Evidence:** This is the **first observational proof** of rock vapor turning into solid crystals in another star system, capturing the **earliest step of rocky planet formation.**

Significance of the Discovery:

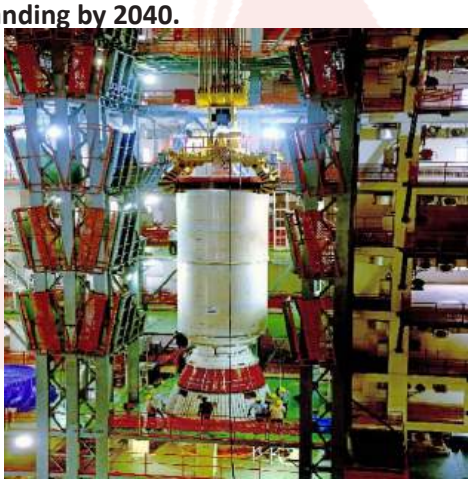
1. **Planet Formation Genesis:** Offers direct insight into how rocky planets like Earth begin forming from vaporized rock.
2. **Solar System Parallel:** Mimics early processes from our own Solar System, bridging observational gaps in planetary evolution.
3. **Rare Astronomical Window:** Tilt of the disc allowed an unprecedented look at inner disc chemistry — rarely accessible in other systems.
4. **Interstellar Mineral Match:** Mineral types mirror **chondritic meteorite inclusions**, hinting at universal chemistry in rocky planet birth.

HUMAN RATED LAUNCH VEHICLE (HLVM3)

Context:

Union Minister confirmed in Parliament that India has completed the development and ground testing of the Human Rated Launch Vehicle (HLVM3) for the Gaganyaan mission, marking a key milestone ahead of India's first human spaceflight.

- The long-term vision includes the **Bharatiya Antariksha Station by 2035** and Indian **Moon Landing by 2040.**



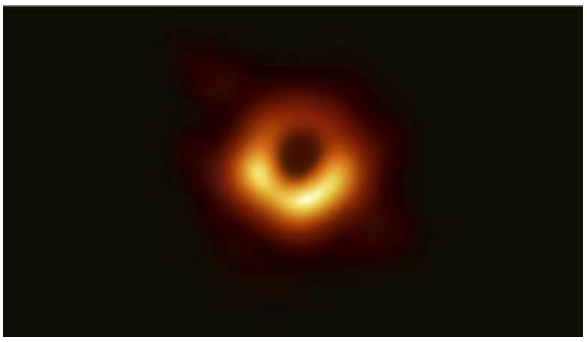
About Human Rated Launch Vehicle (*HLVM3*):

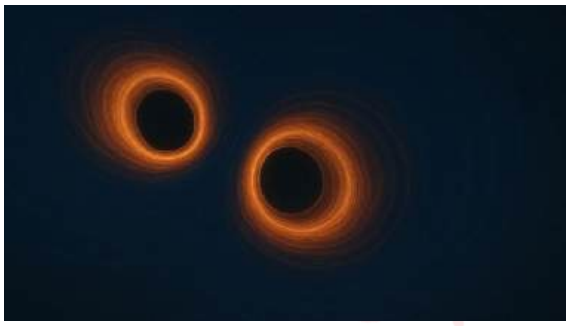
- **What is HLVM3?**
  - HLVM3 is **India's first human-rated launch vehicle**, adapted from the proven **LVM3 (GSLV Mk III)** platform, designed to safely carry astronauts (Gaganyatris) into Low Earth Orbit under the Gaganyaan programme.
- **Developed By:**
  - **Indian Space Research Organisation (ISRO)**
  - Designed under the guidance of the **Human Space Flight Centre (HSFC)**
- **Mission Aim:**
  - Enable safe launch, orbital insertion, and return of Indian astronauts.
  - Form the backbone for future long-term missions like **Bharatiya Antariksha Station** and **Indian lunar landing.**
  - Build self-reliant capacity in human space exploration and demonstrate advanced space safety systems.
- **Key Features of HLVM3:**
  - **Three-Stage Configuration:**
    - Two S200 solid rocket boosters, L110 liquid core stage, and C25 cryogenic stage.
    - Capable of lifting ~10 tonnes to Low Earth Orbit.
  - **Human-Rated Modifications:**
    - Systems upgraded for redundancy, fault-tolerance, and escape options.
    - Designed with higher safety margins and enhanced quality assurance protocols.
  - **Crew Escape System (CES):**
    - Five types of motors already tested.
    - Enables safe ejection of crew during ascent in emergencies.
    - Operational from liftoff to orbital injection phase.
  - **Crew Module (CM) and Service Module (SM):**
    - CM tested for re-entry, parachute deployment, thermal resistance.
    - SM handles power, propulsion, and environmental control.
  - **Supporting Infrastructure:**
    - Gaganyaan Control Centre, training facility, and dedicated launch modifications at SDSC.
    - Recovery operations plan and communication network fully established.

BLACK HOLE GRS 1915+105

Context: ISRO-led scientists observed rapid X-ray flickers from black hole GRS 1915+105 and published findings in Monthly Notices of the Royal Astronomical Society.

- AstroSat data revealed oscillating plasma corona linked to high-frequency Quasi-periodic Oscillations (QPOs).





About Black Hole GRS 1915+105:

- **What is GRS 1915+105?**
  - It is a stellar-mass black hole located in a binary system, paired with a normal star, and known for highly variable X-ray emissions.
- **Discovered By:** Detected in 1992 by the WATCH all-sky monitor on the *Granat* satellite.
- **Located In:** Approximately 28,000 light-years from Earth in the constellation Aquila, within the Milky Way galaxy.
- **Key Features:**
  - **Mass:** ~12 times that of the Sun.
  - **High Variability:** Shows alternating X-ray dips and flares every few hundred seconds.
  - **High Frequency QPOs Detected:** Rapid flickers at 70 Hz (Quasi-periodic Oscillations) during bright phases.
  - **Plasma Corona:** Oscillates between compact-hot and expanded-cool states, driving X-ray variability.
  - **Accretion Process:** Sucks in material from companion star forming a swirling accretion disk (1–10 million °C) and ultra-hot corona (~100 million °C).
- **Significance:**
  - **AstroSat Breakthrough:** First Indian observatory to capture dynamic corona behaviour in real time.
  - **Theoretical Advancement:** Supports the idea that high-frequency X-ray flickers originate from compact corona around black holes.
  - **Astrophysics Insight:** Helps decode the physical environment near event horizons where gravity is extreme.

BLACK HOLE MERGER GW231123

Context: Scientists have detected GW231123, the largest black hole merger ever recorded, using the LIGO-Virgo-KAGRA (LVK) network, revealing black holes 100x and 140x the Sun's mass—a discovery that challenges existing theories of stellar evolution.

About Black Hole Merger GW231123:

- **What Is a Black Hole Merger?**
  - A **black hole merger** is a cosmic event where two black holes orbit each other, gradually spiral inward due to energy loss via **gravitational waves**, and eventually coalesce into a single, larger black hole. These mergers release immense energy, rippling across spacetime.
- **Name of the Event:** GW231123 – Detected during LIGO's fourth observation run.
- **How Did It Occur?**
  - Two massive black holes (140 and 100 times the Sun's mass) collided.
  - Their merger created a **super black hole** about **225 solar masses**.
  - It defies the expected "mass gap" (60–130 solar masses) where black holes aren't supposed to form via normal stellar collapse.
- **Key Features of GW231123:**
  - **Massive Scale:** Largest known stellar-mass black hole merger.
  - **Spin Limit:** One black hole spun near the maximum speed allowed by General Relativity.
  - **Deep Space Origin:** Likely occurred up to **12 billion light-years** away.
  - **Challenging Models:** Suggests prior mergers or exotic astrophysical origins.
  - **Detection Network:** Identified by LIGO (US), Virgo (Italy), and KAGRA (Japan) under the LVK collaboration.
- **Significant:**
  - **Breaks Mass Barrier:** Violates theoretical "mass gap" limit, forcing reassessment of **stellar collapse physics** and supernova models.
  - **New Formation Clues:** May indicate **second-generation mergers**, i.e., black holes formed from prior black hole collisions.
  - **High-Spin Puzzle:** Spins observed near the **relativistic limit**, making waveform modelling highly complex.

Dark Universe Insights: Offers rare data from deep space unreachable via light-based instruments.

SPLASHDOWN LANDINGS

Context:

Indian astronaut Shubhanshu Shukla and the Axiom-4 crew returned safely after a 20-hour journey from the International Space Station (ISS), splashing down in the Pacific Ocean aboard the Crew Dragon spacecraft.

About Splashdown Landings:

- **What Is a Splashdown?**
  - **Splashdown** is a space capsule landing method in which the spacecraft touches down on a **water surface**, typically the **ocean**, using parachutes and buoyancy systems.
  - Capsules like SpaceX's Crew Dragon and ISRO's upcoming Gaganyaan module are designed for sea recovery operations.
- **How It Works?**
  - **Re-entry Speed:** The spacecraft re-enters Earth's atmosphere at over **27,000 km/h**, creating high friction and deceleration.
  - **Parachute Deployment:**
    - Two **drogue parachutes** deploy first at ~18,000 ft to stabilize and reduce speed.
    - Four **main parachutes** follow at ~6,500 ft to further slow the descent.
  - **Controlled Descent:**
    - Capsules **glide at an angle**, not vertically, covering **5,000–7,000 km** before splashdown.
    - Final descent speed reduces to **25–30 km/h**, safe for water landing.
  - **Floatation:** Spacecraft are designed to **float post-landing**, with conical shapes and rounded hulls resembling ship bottoms.
- **Why Splashdowns Are Preferred?**
  - **Simpler & Safer Design:** Water acts as a natural cushion, reducing impact shock without the need for landing legs or complex systems.
  - **Shock Absorption:** Ocean's high density and low viscosity absorb landing forces better than solid ground.
  - **Fewer Precision Demands:** Unlike land, oceans offer vast open areas, so minor off-course drifts cause no harm.
  - **Cost-Effective:** Avoids infrastructure like runways, airbags, or retro-propulsion systems, reducing cost and complexity.
  - **Safety for Crew and Payload:** Water slows impact, minimizing injury risk and protecting onboard equipment.
  - **Compatibility with Current Modules:** Most modern return capsules like Dragon, Orion, Gaganyaan are specifically built for splashdown.

3I/ATLAS-THIRD-EVERINTERSTELLAR OBJECT

Context: The object 3I/Atlas, discovered by the ATLAS telescope in Chile, has been confirmed as the third-ever interstellar object, potentially older than our Solar System.

About 3I/Atlas - Third-Ever Interstellar Object:

- **What is 3I/Atlas?**
  - **Interstellar Origin:** 3I/Atlas is a **hyperbolically orbiting interstellar object**, meaning it came from outside our solar system and is not gravitationally bound to the Sun.
  - **Discovery:** It was spotted by the **Asteroid Terrestrial-impact Last Alert System (ATLAS)** in Río Hurtado, Chile, when it was around **670 million km from the Sun**.
- **Key Features of 3I/Atlas:**
  - **High Speed:** It moves at **~60 km/s** — too fast to be held by the Sun's gravity — confirming its **interstellar nature**.
  - **Current Distance:** The object is now near Jupiter's orbit, about 917 million km from Earth.
  - **Oldest Known Comet:** Scientists estimate its age to be 7 billion years, which is older than the 4.6-billion-year-old Solar System.
- **Significance of 3I/Atlas:**
  - **Clues to Alien Worlds:** Studying it may reveal the chemical and physical makeup of distant planetary systems.
  - **Rare Interstellar Sample:** It gives humanity a direct connection to exoplanetary material,

much before space travel allows such exploration.

- **Builds on Past Discoveries:** It follows **1I/'Oumuamua (2017)** and **2I/Borisov (2019)** as the only known interstellar visitors so far.

- **How Scientists Confirm It's Interstellar?**
  - **Orbit Calculation:** Its open hyperbolic trajectory lacks a returning aphelion, unlike native solar system objects that have elliptical paths.
  - **Initial Velocity:** Its high approach speed at a great distance shows it didn't accelerate here — it came in fast, already moving from another system.

VERA C. RUBIN OBSERVATORY

Context: The Vera C. Rubin Observatory in Chile has released its first test images, showcasing its potential to transform astronomy by detecting millions of celestial events, asteroids, and dark matter signals every night.

About Vera C. Rubin Observatory:

- **What is the Vera C. Rubin Observatory?**
  - The **Rubin Observatory** is a state-of-the-art astronomical facility located on **Cerro Pachón mountain, Chile**, designed to create the most detailed map of the universe and uncover the mysteries of dark matter, dark energy, and near-Earth objects.
- **Location:** Chilean Andes (8,684 ft elevation)
- **Partners:** U.S. Department of Energy (DOE) and National Science Foundation (NSF)
- **Objectives:**
  - Map the **entire southern sky** every 3 days for 10 years.
  - Provide a **dynamic record** of the universe to detect cosmic changes.
  - Track **near-Earth objects** (NEOs) and potential asteroid threats.
  - Investigate **dark matter** and **dark energy** with precision.
  - Enable public access to astronomical data for global research.
- **Key Features:**
  - **Wide Field of View:**
    - Can scan an area equal to **40 full Moons** in one image.
    - Surpasses Hubble and James Webb in sky coverage.
  - **World's Largest Digital Camera:**
    - **3,200 Megapixels**, weighs **2,800 kg**, as big as a small car.
    - Can detect objects **100 million times dimmer** than visible light.
    - Six filters capture UV to infrared light for spectral analysis.
  - **Rapid Movement:**
    - Fastest telescope slewing time: moves between targets in **5 seconds.**
    - Can take **1,000 images per night**, completing full-sky scans in 72 hours.
  - **Automated Detection Software:**
    - Generates **10 million alerts per night** by comparing new and old images.
    - Detected **2,100+ new asteroids** in 10 hours during test phase.
  - **Massive Data Generation:**
    - Produces **20 terabytes of data daily.**
    - Will detect and catalogue over **5 million asteroids** and **100,000 NEOs** in a decade.
- **Significance:**
  - **Advancing Dark Matter Research:** Builds detailed 3D maps of the universe to analyse gravitational effects and cosmic structures
  - **Early Threat Detection:** Enhances planetary defence through rapid NEO tracking
  - **Astrophysical Breakthroughs:** Could validate or refute theories about galaxy formation and the universe's expansion

GOSAT-GW SATELLITE

Context: Japan successfully launched the GOSAT-GW climate monitoring satellite aboard its H-2A rocket, marking the rocket's 50th and final mission before its retirement.

About GOSAT-GW Satellite:

- **What is GOSAT-GW?**
  - GOSAT-GW stands for **Global Observing**

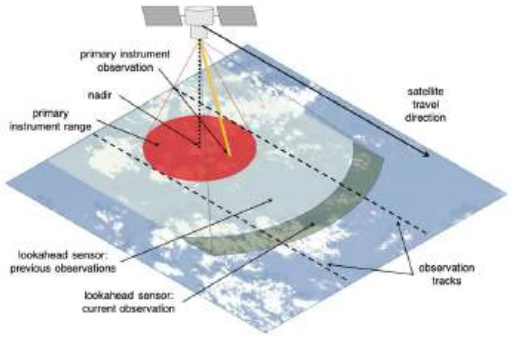
Satellite for Greenhouse Gases and Water Cycle.
    - It is the **third satellite** in Japan's GOSAT series dedicated to monitoring greenhouse gases and water cycle data on a global scale.
- **Developed By:** Japan Aerospace Exploration Agency (JAXA)
    - In collaboration with **Mitsubishi Heavy Industries (MHI)**, which handled launch operations.
- **Launched Through:**
    - **H-2A rocket**, a liquid-fuel launcher with solid-fuel boosters, from the **Tanegashima Space Centre**.
- **Objectives:**
    - **Monitor Greenhouse Gases**: Collect data on carbon dioxide, methane, and other climate-impacting gases.
    - **Study Global Water Cycles**: Measure Sea surface temperature, cloud cover, and precipitation trends.
    - **Support Climate Policy**: Provide accurate, high-resolution data to global stakeholders including NOAA (USA).
- **Key Features:**
    - **High-Resolution Observation**: Delivers enhanced spatial and temporal accuracy for climate variables.
    - **Real-Time Global Data Sharing**: Expected to begin data transmission within one year of deployment.
    - **Dual Focus**: Simultaneously monitors both greenhouse gases and hydrological parameters—unique among satellites.
    - **International Access**: Open data access model enhances global climate transparency and collaboration.
- **Significance:**
    - **Advances Climate Science**: Strengthens Earth system observation capacity amid rising climate risks.
    - **Promotes Global Cooperation**: Supports international frameworks like the **Paris Agreement** through data sharing.
    - **Marks a Space Technology Milestone**: Concludes H-2A's successful legacy and transitions to the cost-efficient H3 launcher.
    - **Boosts Japan's Commercial Space Profile**: Demonstrates commitment to reliable, low-cost launch services for global clients.
    - **Strengthens National Security & Space Autonomy**: Ensures Japan maintains independent space-based environmental surveillance.

Topics: Awareness in the fields of IT, Computers, robotics, nano-technology, bio-technology and issues relating to intellectual property rights.

AI DRIVEN DYNAMIC TARGETING TECHNOLOGY

Context:

NASA's Jet Propulsion Laboratory (JPL) has successfully tested an AI-driven system called Dynamic Targeting, enabling Earth-observing satellites to autonomously avoid clouds and focus on high-value scientific targets.



About AI driven Dynamic Targeting Technology:

- **What it is?**
    - Dynamic Targeting is an **AI-powered onboard software system** that allows satellites to autonomously detect, analyze, and respond to Earth-based phenomena in real time.
- **Developed by:** Developed by **NASA's Jet Propulsion Laboratory (JPL)**, with collaboration from **Open Cosmos** and **Ubotica**, under NASA's Earth Science Technology Office.
- **Objective:**
    - To maximize the **quality and relevance of satellite data** by intelligently selecting observation targets like clear-sky zones, wildfires, storms, and volcanic eruptions, without ground-based commands.
- **How Dynamic Targeting Works?**
    - **Lookahead Sensor Technique:** The satellite tilts forward to capture visuals up to **500 km ahead**, analyzing potential obstructions or targets.
    - **Cloud Detection via AI:** An **onboard AI processor** classifies cloud vs. clear regions using optical and near-infrared imagery.
    - **Decision in <90 Seconds:** Based on the analysis, the satellite **automatically alters its imaging plan**, capturing only clear-sky ground data.
    - **Pivot and Shoot Mechanism:** After analysis, the system pivots to **nadir view** and captures

the refined observation frame within **60–90 seconds**.

- **Key Features:**
  - **Real-Time Autonomy:** No ground control needed; satellite decides imaging target in space.
  - **AI Edge Processing:** Uses advanced **onboard neural networks**, reducing communication delays.
  - **Lightweight Implementation:** Tested on **CubeSat-sized payloads**, showing scalability to smaller satellites.
  - **Cloud-Avoidance Optimization:** Significantly increases the **usable imagery yield**, solving a major data-waste problem in Earth observation.
  - **Scalability to Constellations:** Can be integrated into **multi-satellite fleets** for coordinated observations, including for planetary missions
- **Strategic Significance:**
  - **Improved Climate Monitoring:** Enhances observation of rare, short-lived climate events like wildfires and ice storms.
  - **Operational Efficiency:** Reduces storage, processing, and downlink load, optimizing satellite bandwidth.
  - **Disaster Readiness Tool:** Could autonomously detect volcanoes, hurricanes, and other disasters in real time, aiding early warning systems.

KERALA'S KITE INITIATIVE

Context: Kerala's KITE initiative has gained national and international attention for ethically integrating Artificial Intelligence (AI) in school education, with UNICEF recognising it as a global best practice in responsible EdTech.

About Kerala's KITE Initiative:

- **What is KITE?**
  - **Kerala Infrastructure and Technology for Education (KITE)** is the technology arm of Kerala's General Education Department. It was established to integrate **digital tools and AI in school education** while ensuring **transparency, inclusion, and teacher autonomy**.
- **Launched by:** Government of Kerala
- **Objective:** To enable **ethical, equitable, and open-source-based** AI integration in public education; to empower teachers and protect student data sovereignty.
- **Key Features of the KITE AI Initiative:**
  - **Mass Teacher Training:** Trained 80,000+ teachers (Classes 8–12) in critical AI use, including bias detection, privacy concerns, and curricular alignment.
  - **Free and Open-Source Software (FOSS):** Adopted across 15,000+ schools, ensuring autonomy, cost-effectiveness, and transparency in AI tools.
  - **Samagra Plus AI Platform:** Kerala's own **RAG-based AI engine** curated by expert teachers; aligns directly with state curriculum to avoid test-prep or bias traps.
  - **Student-Centric Innovation:** Little KITEs IT Clubs train students in robotics and AI through hands-on, contextual learning; praised by **UNICEF as a global best practice**.
  - **Data Sovereignty & Bias-Resistance:** By using in-house infrastructure and open datasets, KITE avoids commercial surveillance models and ensures bias-resistant AI responses.

AI APPRECIATION DAY

Context: India observed AI Appreciation Day on July 16 to highlight the country's rapid progress in artificial intelligence across sectors like healthcare, education, governance, and agriculture.

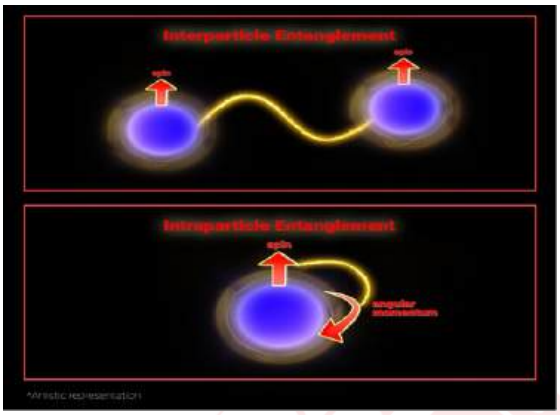
About AI Appreciation Day:

- **What It Is?**
  - An annual event that recognizes the **transformative role of AI** in society, and acknowledges the contributions of developers, scientists, and policymakers in advancing AI for public good.
- **Celebrated On:** July 16 every year, globally and now with active observance in India.

- **Objectives:**
  - Celebrate AI innovations that solve real-world challenges.
  - Raise awareness about the ethical use of AI in public and private sectors.
  - Promote inclusive growth by integrating AI into governance and service delivery.
  - Encourage youth participation and skilling in AI technologies.
- **Key Features of India's AI Journey:**
  - **Historical Foundation:** India's AI trajectory began in the 1960s with early computing research and advanced through 1986's Knowledge-Based Computer Systems (KBCS) project.
  - **Institutional Push:** Initiatives like Digital India (2015) and NITI Aayog's National Strategy for AI (2018) institutionalized AI in governance and planning.
  - **Diverse Applications:**
    - AI is being applied in:
    - **Healthcare**: Early diagnostics and telemedicine.
    - **Agriculture**: Precision farming and pest prediction.
    - **Education**: Adaptive learning and language translation tools.
    - **Governance**: Chatbots, e-courts, and real-time grievance redressal.
  - **Ethical Reflection:** The Day is also a reminder to foster **responsible AI use**, especially in addressing bias, transparency, and cybersecurity.
- **Significance:**
  - **Boosts National AI Capacity:** Showcases India's readiness to be a global AI hub.
  - **Empowers Citizens:** Democratizes access to services via smart governance tools.
  - **Strengthens Digital Economy:** AI contributes to innovation, productivity, and startup growth.
  - **Promotes Equity:** Encourages inclusion of underserved communities in digital progress.

QUANTUM NOISE

Context: Indian scientists from Raman Research Institute (RRI) have discovered that quantum noise, previously seen as destructive, can generate and revive entanglement in certain quantum systems.



About Quantum Noise:

- **What is Quantum Noise?**
  - Quantum noise refers to **random disturbances** that affect quantum systems due to unavoidable interaction with the environment. It leads to **decoherence**, making entangled states unstable—posing a challenge for quantum computing.
- **Origin and Nature of Quantum Noise:**
  - **Quantum origin:** Arises from Heisenberg's Uncertainty Principle and quantum interactions with thermal or electromagnetic environments.
  - **Environment-induced:** Happens when quantum systems are not perfectly isolated—causing errors or collapse of quantum states.
  - **Unavoidable:** Even the most controlled quantum labs cannot eliminate all noise due to environmental interaction.
- **Features of Quantum Noise:**
  - **Decoherence-inducing:** Breaks the link between entangled particles, damaging quantum information.
  - **Random yet measurable:** Often modelled through channels like amplitude damping, phase damping, and depolarizing noise.
  - **System-dependent behaviour:** Different for intraparticle vs interparticle entanglement.
  - **Non-deterministic impact:** May reduce, alter, or—surprisingly—**generate** entanglement under certain conditions.
- **Significance of This Discovery:**
  - **Paradigm Shift:** Redefines the role of noise from being a threat to becoming a constructive force in quantum systems.
  - **Improved Quantum Stability:** Intraparticle entanglement shows greater resistance to decoherence—key for real-world quantum devices.
  - **Foundation for Quantum Tech:** Enables progress in quantum communication, quantum cryptography, and quantum error correction.

- **Cross-platform applications:** Findings apply to photons, neutrons, trapped ions—not limited to a single quantum setup.

PHASE 3 TRIALS OF ITS FIRST INDIGENOUS DENGUE VACCINE

Context: India has enrolled over 8,000 participants in Phase 3 trials of its first indigenous dengue vaccine, developed by Panacea Biotec and supported by ICMR.

About Phase 3 Trials of Its First Indigenous Dengue Vaccine:

- **What Is India's First Dengue Vaccine?**
  - **Name:** *DengiAll* – a **tetravalent dengue vaccine** designed to protect against all four dengue virus serotypes (DENV-1 to DENV-4).
  - **Origin:** Derived from the **TV003/TV005 strain** originally developed by the U.S. National Institutes of Health (NIH) and licensed to Indian firms.
- **Organisations Involved:**
  - **ICMR (Indian Council of Medical Research):** Primary funder and scientific lead.
  - **Panacea Biotec:** Vaccine developer holding process patents and leading formulation trials.
- **How It Works?**
  - **Tetravalent nature:** Offers immunity against all four dengue strains, reducing chances of reinfection.
  - **Live-attenuated virus:** Introduces weakened viruses to safely trigger immune response.
  - **Two-dose vaccine:** Participants receive doses followed by two years of medical follow-up to assess efficacy.
- **Key Features:**
  - **Pan-India Coverage:** Trials being conducted at **20 centres** including Chennai, Pune, Delhi, Hyderabad.
  - **Large-Scale Participation:** Nearly **80% enrolment** completed out of 10,000 targeted candidates.
  - **Process Patented:** Panacea holds proprietary rights over vaccine formulation.
  - **Previous Trial Success:** Phase 1 and 2 completed in 2018–19 with encouraging results.
  - **Clinical Vigilance:** Participants to be monitored for **two years** post-vaccination
- **Significance for India:**
  - **Public Health Impact:** Addresses one of India's most widespread mosquito-borne illnesses.
  - **Child Health Focus:** Offers critical protection for children, who face higher hospitalisation risk.
  - **Reduces Repeat Infections:** Crucial due to low cross-protection between dengue serotypes.

JAPONICA RICE

Context: Scientists at the National Institute of Plant Genome Research (NIPGR) have used CRISPR-Cas9 gene-editing to enhance phosphate uptake in japonica rice, leading to a 20–40% increase in yield under controlled phosphate use.

About Japonica Rice:

- **What is Japonica Rice?**
  - Japonica rice is a **short-grain, high-starch variety** of rice primarily grown in **East Asia**, often used in breeding experiments due to its **ease of genetic modification** and stable traits in controlled environments.
- **Developed By:**
  - Developed by **NIPGR, New Delhi**, using **CRISPR-Cas9** gene editing
  - Research published in the **Plant Biotechnology Journal**
  - **Cultivar used:** Nipponbare (a model japonica variety)
- **How Was It Developed?**
  - **Target Gene Identified:** OsPHO1;2, a phosphate transporter moving phosphorus from root to shoot
  - **Repressor Found:** OsWRKY6, a negative regulator of this transporter
  - **Initial Strategy Failed:** Knocking out the repressor impaired other plant functions
  - **Precise Editing:** Only the **30 base-pair binding sites** of the repressor was removed using CRISPR

- **Outcome:** Increased phosphate flow to the shoot, leading to better seed development

- **Key Features of Gene-Edited Japonica Rice:**
  - **20% higher yield** with full fertilizer dose and **40% yield gain** with only 10% of recommended phosphate.
  - **Increased phosphate absorption** due to improved transporter activation.
  - **More panicles and seeds**, while seed quality and dimensions remained normal.
  - **No foreign DNA** in final generation; removed via **Mendelian segregation.**
  - **No off-target effects** detected; validated using top genome-prediction software.
  - Successfully simulates **minimal-invasive promoter gene surgery.**
- **Significance for India:**
  - **Reduces Dependence on DAP Imports:** India imports ~4.5 million tonnes annually.
  - **Tackles Phosphorus Deficiency:** Crucial for Indian soils suffering nutrient loss.
  - **Eco-Friendly Agriculture:** Optimizes phosphate use, reducing runoff and pollution.
  - **Future Prospects:** Potential replication in **indica rice**, India's major cultivar.
  - **Boost to Food Security:** Improves productivity in nutrient-limited conditions.

DARK WEB

Context:

A 35-year-old engineer from Kerala, was arrested for operating as a Level-4 darknet vendor, allegedly selling LSD and ketamine online using the dark web and cryptocurrency platforms.

About Dark Web:

- **What is the Dark Web?**
  - The **dark web** refers to a **concealed part of the internet** not indexed by standard search engines and accessible only through **special browsers like Tor**, offering anonymity and encryption.
- **How Does It Work?**
  - **Access Tool:** Requires downloading the **Tor browser** (The Onion Router)
  - **Routing Process:** Routes user traffic through **multiple random nodes**, encrypting data at every layer
  - **Website Domain:** Uses ".onion" addresses, hidden from traditional search engines
  - **Decentralisation:** No central authority, making regulation and surveillance extremely difficult
- **Key Features:**
  - **Anonymity and Encryption:**
    - Conceals IP addresses and browsing activity
    - Ensures users and hosts remain untraceable
  - **Marketplace Ecosystem:** Includes legal and illegal marketplaces, forums, data dumps, and whistleblowing platforms
  - **Censorship Resistance:**
    - Offers access to uncensored information in authoritarian regimes
    - Used by **journalists, activists, and whistleblowers** for secure communication
  - **Cybercrime Risks:**
    - Facilitates illegal trade in drugs, weapons, hacking services, and stolen data
    - Difficult for law enforcement to track due to layered encryption
- **What is a Level-4 Vendor on the Dark Web?**
  - A **grading system** used within darknet marketplaces to rank vendors
  - Based on factors such as:
    - Potency and variety of drugs sold
    - Customer service quality
    - Reliability and delivery success rate
  - **Level-4** represents a **high-tier trusted seller** with a significant customer base and strong reputation.
  - Edison was reportedly **India's only Level-4 vendor**, indicating large-scale operations.

INDIA'S FIRST NATIONAL BIOBANK

Context:

Union Minister inaugurated India's first National Biobank and a Longitudinal Population Data Study at CSIR-IGIB, New Delhi, under the **Phenome India initiative,** aimed at enabling personalised healthcare and indigenous genomic research.

About India's first National Biobank:

- **What is the National Biobank?**
  - A **centralised, high-resolution genomic and clinical database** capturing India's ethnic, lifestyle, and health diversity.
  - Part of **Phenome India**, a **longitudinal cohort study** to track disease patterns and gene-environment interactions over time.
- **Developed By:**
  - Council of Scientific and Industrial Research (CSIR) – Institute of Genomics and Integrative Biology (IGIB)
  - Supported by the **Ministry of Science and Technology, Government of India**
- **Objectives:**
  - Build India's **own population-specific health database**
  - Enable **personalised treatment regimens** based on genomic profiles
  - Facilitate **AI-powered diagnostics and gene-guided therapies**
  - Strengthen research on **rare diseases, AMR, cancer, diabetes, and cardiovascular diseases**
- **Key Features:**
  - Collects **genomic, lifestyle, and clinical data** from over **10,000 individuals** across the country
  - **Inspired by the UK Biobank,** but tailored to Indian diversity in geography, caste, ethnicity, and socio-economic conditions
  - Powers **long-term health tracking** to understand disease susceptibility, treatment response, and environmental influence.
- **Significance:**
  - Makes India **self-reliant in health and genomic data infrastructure**
  - Catalyses **personalised medicine and preventive healthcare** in public systems
  - Empowers CSIR and IGIB to **develop low-cost indigenous CRISPR therapies**

Topics: Conservation related issues

INDIA WETLANDS RESOLUTION WAS FORMALLY ADOPTED AT RAMSAR COP15

Context: India's resolution titled "Promoting Sustainable Lifestyles for the Wise Use of Wetlands" was formally adopted at Ramsar CoP15 held in Victoria Falls, Zimbabwe on 30th July 2025.

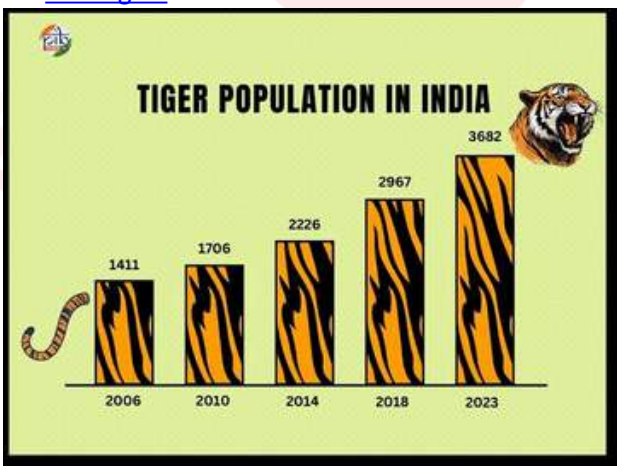
About India Wetlands Resolution was formally adopted at Ramsar CoP15:

- **What it is?**
  - A global resolution introduced by India at Ramsar CoP15 to integrate sustainable lifestyles into wetland conservation strategies using a whole-of-society approach.
- **Aim of the Resolution:**
  - Promote **pro-planet behavioural choices** that support wetland protection.
  - Integrate **sustainable consumption and production** into wetland policies and management plans.
- **Key Features:**
  - **Behavioural Focus:** Recognises individual and community choices as central to wetland conservation.
  - **Policy Integration:** Encourages inclusion of lifestyle-based interventions in national and local wetland plans.
  - **CEPA Alignment:** Supports Resolution XIV.8 on **Communication, Education, Participation and Awareness (CEPA)**.
  - **Educational Drive:** Emphasises education at all levels and awareness campaigns on sustainable wetlands use.
  - **Collaborative Approach:** Seeks **public–private partnerships** for mobilising sustainable actions.
  - **Global Linkages:** Builds on **UNEA 6/8 (2024)** and **UNFCCC CoP26's Mission LiFE**, amplifying India's climate leadership.
- **Significance:**
  - **Elevates India's soft power** in global environmental governance through innovative lifestyle diplomacy.
  - Translates **Mission LiFE** from a national movement to a global wetland conservation paradigm.
  - Supports **SDGs 6, 12, 13, 15 & 17** by linking consumption behaviour, biodiversity, and water sustainability.
  - Reinforces India's wetland conservation

efforts under **Mission Sahbhagita** and **Save Wetlands Campaign**, engaging over 2 million citizens.

INTERNATIONAL TIGER DAY 2025

Context: India is celebrating International Tiger Day 2025 on July 29, highlighting its achievement of housing 75% of the world's wild tigers across 58 reserves.



About International Tiger Day 2025:

- **What is it?**
  - A global awareness day observed annually on **July 29**, aiming to raise awareness about tiger protection and habitat conservation.
- **Established in: 2010**, during the *St. Petersburg Tiger Summit* in Russia, with participation from **13 tiger-range countries**, including India.
- **Key Features:**
  - Platform to highlight threats like habitat loss, poaching, and human-wildlife conflict.
  - Monitors progress on the **Tx2 Goal**—to double wild tiger populations by 2022.
  - Celebrates efforts made by countries in increasing tiger numbers and protecting forests.
- **India's Tiger Conservation Journey:**
  - **Project Tiger (Launched in 1973):**
    - Started with **9 reserves**, expanded to **58 tiger reserves**.
    - Governed by the **National Tiger Conservation Authority (NTCA)**.
    - Reserves now cover **2% of India's land area**.
  - **Major Achievements:**
    - **Doubled tiger population**: From ~1,400 in 2006 to **3,682 in 2024**.
    - Achieved the global **Tx2 target** ahead of schedule.
    - Tigers occupy **138,200 sq. km** of forest shared with ~60 million people.
  - **Ecological Significance:**
    - Tigers regulate herbivore populations, preserving forest balance.
    - Healthy tiger habitats support biodiversity, improve **climate resilience**, and act as **carbon sinks**.
    - Forests act as water catchments, helping nearby agriculture and communities.
- **India's Role in Global Conservation:**
  - Contributes **75% of world's tiger population**, while holding only **18% of global tiger habitat**.
  - India's model, combining scientific management, legal protection, and community participation, is **emulated by other tiger-range nations**.

FIRST-EVER GRASSLAND BIRD CENSUS IN KAZIRANGA NATIONAL PARK

Context: Prime Minister of India highlighted the first-ever Grassland Bird Census in Kaziranga National Park during

his Mann ki Baat, praising its innovative use of acoustic technology and its role in biodiversity conservation.

About First-ever Grassland Bird Census in Kaziranga National Park:

- **What is it?**
  - A landmark bird population survey aimed specifically at grassland-dwelling birds in Kaziranga National Park (Assam), covering the period from **March 18 to May 25, 2025**.
- **Who conducted it?**
  - Jointly undertaken by:
    - Forest department officials
    - Researchers including INSPIRE fellow Chiranjib Bora
    - Conservationists and Kaziranga park authorities
- **Objectives of the Census:**
  - Monitor population of grassland bird species
  - Identify rare, endemic, and globally threatened species
  - Map breeding patterns and ecological health of the habitat
- **Methodology and Innovation:**
  - **Passive Acoustic Monitoring:** Recorders placed on tall trees captured birdcalls during the breeding season (March–May).
  - **Audio Identification Tools:**
    - Spectrogram analysis for visualizing sound frequencies
    - AI-based **BirdNET software** to identify bird species by song
  - **Coverage:** Surveyed 29 locations using six recorders over three-day cycles
- **Key Features of the Census:**
  - **First of its kind in India:** Focused exclusively on *grassland bird species*, often underrepresented in conventional bird surveys.
  - **Data-Driven Approach:** Documented 43 species, including 1 Critically Endangered, 2 Endangered, and 6 Vulnerable birds as per the IUCN Red List.
  - **Conservation Breakthrough:** Discovery of over 85 nests of the endangered Finn's Weaver, endemic to the Brahmaputra floodplains.
  - **Ecological Indicator Role:** Presence of grassland birds indicates healthy habitat quality, similar to BMI as a health marker.
  - **Highlight on Threats:** Census underlined habitat loss due to ecological succession, overgrazing, cultivation, and climate change impacts.

RHINO HORN

Context:

The Assam Forest Department, in coordination with the Wildlife Institute of India (WII), has initiated genetic analysis of 2,573 rhino horn samples stored before their destruction in 2021.

- This move will help build India's **Rhino DNA Index System (RhoDIS)** to aid in conservation and anti-poaching efforts.

About Rhino Horn:

- **What is a Rhino Horn?**
  - The horn is the most **distinctive feature** of a rhinoceros, made not of bone but **keratin**, the same protein in human nails and hair.
  - Rhino horns **grow continuously**, gaining about **2 cm per year**.
- **Key Features:**
  - **Solid Structure:** Unlike antlers, rhino horns are not hollow and are composed of compacted keratin layers.
  - **Toughened Core:** Contains **melanin** and **calcium**, enhancing strength and resistance to UV damage.
  - **Shape Formation:** External behaviours like scraping, grazing, and environmental exposure gradually form its **cone-like shape**.
  - **Identification Tool:** Each horn has unique keratin layers influenced by diet and climate, aiding **genetic fingerprinting** under RhoDIS.
  - **Poaching Threat:** Rhino horns are highly valued in illegal wildlife trade, often due to false medicinal beliefs.

About Greater One-Horned Rhinoceros:

- **What is it?**
  - Also known as the **Indian Rhinoceros** (*Rhinoceros unicornis*), it is the **largest** of the

five rhino species.
    - It is **found only in South Asia**, mainly in **northeastern India** and **Nepal**.
- **Habitat & Distribution:**
    - Inhabits tropical and subtropical grasslands, savannas, and riverine floodplains.
- **Major strongholds:** Kaziranga National Park (Assam), Jaldapara (West Bengal), and Chitwan (Nepal).
- **IUCN Red List:** Vulnerable
- **Distinctive Features:**
    - **Single Black Horn:** Measures **8–25 inches**, a defining trait.
    - **Armoured Appearance:** Thick grey-brown hide with **folded skin plates**.
    - **Herbivorous:** Feeds on grasses, aquatic plants, fruits, and shrubs.
    - **Semi-Solitary:** Except during wallowing or grazing periods.
    - **Role in Ecosystem:** Acts as a **keystone grazer** that shapes wetland ecosystems.

KOMBUCHA

Context: A new study in The Journal of Nutrition has revealed that kombucha, a fermented tea drink, can positively modulate gut microbiota in individuals with obesity.

About Kombucha:

- **What is It?**
    - **Kombucha** is a **fermented, lightly effervescent tea-based beverage** traditionally consumed for its digestive and probiotic benefits.
    - It is classified as a functional food due to its potential to support gut, metabolic, and immune health.
- **Composition:**
    - Made from **sweetened black or green tea**, fermented using **SCOBY** (Symbiotic Culture of Bacteria and Yeast).
    - Contains:
        - **Probiotics** (live bacteria and yeast)
        - **Polyphenols** (flavonoids and phenolic acids)
        - **Organic acids**, vitamins, and antioxidants
        - Trace alcohol due to fermentation
- **Key Characteristics:**
    - **Effervescent** (naturally carbonated) and tangy in flavor.
    - **Shelf-stable probiotic source**, depending on pasteurization.
    - **Adaptable to local microbiota**; effects may vary across populations.
    - Often marketed in India as a **health-oriented beverage**.
- **Health Benefits:**
    - **Gut Microbiome Rebalancing:** Increases beneficial strains like Akkermansiaceae and Prevotellaceae (linked to insulin sensitivity and lower inflammation).
    - **Reduces Harmful Microbes:** Lowers bacteria like **Ruminococcus gnavus** and **Dorea**, associated with metabolic disorders.
    - **Fungal Balance:** Decreases fungi such as **Rhodotorula** and **Exophiala**, linked to obesity and gut dysbiosis.
    - **Supports Mucus Secretion**: Phenolic compounds stimulate mucus production in the gut, improving barrier integrity.
    - **Potential Anti-inflammatory Effects**: Associated microbial shifts may reduce chronic low-grade inflammation.

Topics: environmental pollution and degradation, environmental impact assessment.

ENVIRONMENT PROTECTION (MANAGEMENT OF CONTAMINATED SITES) RULES, 2025

Context: The Union Environment Ministry has notified the Environment Protection (Management of Contaminated Sites) Rules, 2025, offering India its first legal framework to scientifically identify, assess, and clean up chemically contaminated sites.

About Environment Protection (Management of Contaminated Sites) Rules, 2025:

- **What It Is?**
    - A comprehensive legal framework under

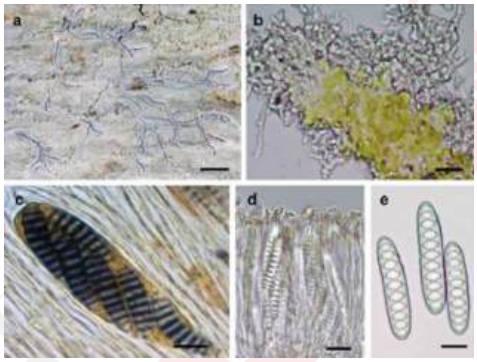
the Environment (Protection) Act, 1986 to manage, assess, and remediate chemically contaminated sites across India.

- **Ministry:** Notified by the Ministry of Environment, Forest and Climate Change (MoEFCC).
- **Objective:**
  - To establish a time-bound, legally binding mechanism for the identification, assessment, and remediation of contaminated sites caused by hazardous chemical and waste dumping, in line with the "Polluter Pays" principle and environmental health protection.
- **What is Contaminated Site?**
  - Sites where hazardous or chemical waste was dumped historically, causing long-term pollution of soil, water, or air. These include abandoned landfills, chemical spill zones, illegal waste sites, and defunct industrial areas.
- **Key Provisions:**
  - **Site Identification & Monitoring:**
    - District authorities must submit **biannual reports** on suspected contaminated sites.
    - State Pollution Control Boards (SPCBs) or designated bodies must provide a **preliminary assessment within 90 days**.
  - **Final Confirmation & Remediation:**
    - Within **180 days**, sites must be fully evaluated and confirmed for contamination.
    - A **reference organisation** (expert body) prepares a **remediation plan.**
  - **Responsibility & Liability:**
    - SPCBs must identify the **polluter** within 90 days.
    - If untraceable or insolvent, the **Centre and States jointly bear cleanup costs**.
    - **Criminal liability** enforced under Bharatiya Nyaya Sanhita (2023) if human/environmental harm is proven.
  - **Transparency & Enforcement:**
    - Mandatory creation of a **national inventory** of contaminated sites.
    - Public disclosure of cleanup status and annual audits required.
- **Significance for Environmental Governance:**
  - Fills critical policy vacuum by giving statutory teeth to CPCB's contaminated site list.
  - Operationalizes "Polluter Pays" principle with strict timelines.
  - Aligns India with UN SDG 6 (clean water), SDG 3 (health), and SDG 12 (responsible consumption & waste).

Topics: Species in News

ALLOGRAPHA EFFUSOSOREDICA

Context: A new species of lichen, Allographa effusosoredica, has been discovered in the Western Ghats by scientists from MACS-Agharkar Research Institute, Pune.



About Allographa effusosoredica:

- **What It Is?**
  - A **newly identified crustose lichen species** under the genus Allographa, belonging to the family Graphidaceae.
  - Lichens are composite organisms formed by symbiosis between fungi and photosynthetic partners like algae or cyanobacteria.
- **Found In:**
  - Discovered in the **Western Ghats**, a global biodiversity hotspot.
  - Adds to the growing inventory of lichen diversity in India—53 Allographa species reported, 22 from the Western Ghats alone.
- **Key Features:**
  - Shows **effuse soredia**, and presence of **norstictic acid** (a rare chemical trait within this genus).
  - Possesses a **Trentepohlia algal partner**, strengthening understanding of tropical photobiont diversity.
  - Mimics Graphis glaucescens morphologically but is genetically closer to Allographa xanthospora.
  - DNA analysis used multiple genetic markers: **mtSSU, LSU, RPB2 (fungal)** and **ITS (algal)**.
  - Studied using **polyphasic taxonomy**—combining morphology, chemistry, and molecular tools.
- **Significance:**
  - First time an Indian Allographa species has been sequenced using molecular markers.
  - Highlights symbiotic co-adaptation between locally specific fungi and algae in tropical climates.
  - Supports **integrative taxonomy**—crucial for accurately identifying cryptic species in

biodiversity hotspots.
- Adds to conservation science by revealing **hidden biodiversity** that supports ecosystem health (e.g., bioindicators, soil generation).

BEGONIA NYISHIORUM

Context:
A new flowering plant species, *Begonia nyishiorum*, has been discovered in East Kameng district of Arunachal Pradesh, highlighting the rich unexplored biodiversity of the Eastern Himalayas.

About Begonia nyishiorum:

- **What It Is?**
  - *Begonia nyishiorum* is a **newly identified flowering plant species**, belonging to the **Begoniaceae** family.
  - It is **endemic to Arunachal Pradesh** and not found anywhere else in the world.
  - The species has been named in honour of the **Nyishi tribe**, the largest indigenous community of Arunachal Pradesh.
- **Natural Habitat:**
  - Found on moist, shaded mountain slopes between 1,500–3,000 metres elevation.
  - Located in two high-altitude forest sites in East Kameng, some covered in early winter snow.
  - Grows in pristine, undisturbed ecosystems protected by local communities.
- **Key Features:**
  - **Unique Crimson-Fringed Petioles**: Light green stalks sheathed in dense, crimson fringes – a trait unseen in any Asian begonia.
  - **High-Altitude Adaptation:** Thrives in sub-zero conditions and steep slopes.
  - **Distinctive Indumentum:** Dense hair-like covering not recorded in over 2,150 global begonia species.
  - **Limited Distribution:** Currently known only from two specific forest patches in Arunachal.
  - **Culturally Named:** Named *nyishiorum* to honour the Nyishi tribe's role in forest stewardship.
- **Significance:**
  - **Highlights Arunachal's Biodiversity**: Reaffirms the state's status as a biodiversity hotspot and cradle of Himalayan plant evolution.
  - **Conservation Priority**: Adds urgency to preserve unexplored high-elevation forests from human encroachment.
  - **Global Recognition**: Enhances India's visibility in global botanical taxonomy and conservation science.

KHARAI CAMELS

Context: A herd of 33 rare Kharai camels from Gujarat's Singach village was caught in the Arabian Sea tide near Jamnagar while grazing on mangroves.

About Kharai camels:

- **What is the Kharai Camel?**
  - Kharai camel is a rare **swimming camel breed** of Gujarat, uniquely adapted to coastal and marshy ecosystems. It is India's **ninth recognized camel breed**, known for foraging in saline environments.
- **Habitat and Distribution:**
  - Native to **Kutch region** of Gujarat, especially **Bhachau, Abdasa, Lakhpat**, and parts of Devbhoomi Dwarka and Jamnagar.
  - Approximately **4,000 Kharai camels** are found in Gujarat, with 2,000 in coastal Kutch alone.
  - Inhabits **mangrove islands** and swims through shallow sea water to graze.
- **Origin and Cultural Link:**
  - Closely associated with the **Rabari and Fakirani Jat communities**, who manage them through traditional pastoral systems.
  - **Maldharis** are a **pastoralist community** of Gujarat, meaning "owner of livestock".
    - They traditionally rear **Kharai camels**, cattle, and goats in **Kutch and Gir** forest regions.
  - The word 'Kharai' comes from Gujarati **'khara'** meaning **salty**, referring to their saline habitat.

- **Key Characteristics:**
  - **Swimming Ability**: Can swim up to **3 km** in the Arabian Sea to access mangrove grazing grounds.
  - **Adapted Physiology:** Can survive on **saline vegetation**, unlike most camel breeds.
  - **Dromedary Type:** Single-humped, muscular, and can weigh up to **500 kg**.
  - **Monsoon Migration:** Moves to **mangrove islands** during the rainy season for weeks.
  - **Diet Specialisation:** Primarily feeds on **mangroves**, a rare trait among camelids.
- **Significance and Conservation Importance:**
  - **Ecological Role:** Maintains balance in fragile coastal ecosystems through sustainable grazing.
  - **Cultural Heritage:** Embodies the **indigenous pastoral economy** and resilience of nomadic life.
  - **Climate Resilience:** Represents climate-adapted livestock vital for **climate-smart agriculture**.

Topics: Climate Change

SHARM EL-SHEIKH DIALOGUE

Context: Conference of the Parties (CMA – 6) welcomed the 2024 report of the Sharm el-Sheikh Dialogue and encouraged continued inclusive, transparent workshops in 2025.

About Sharm el-Sheikh Dialogue:

What It Is?

- An ongoing formal **dialogue platform under the Paris Agreement**, initiated by Decision 1/CMA.4 (Para 68).
- Facilitates structured exchange between Parties, institutions, and stakeholders on aligning finance flows with climate goals.

- **Members and Structure:**
  - Conducted under UNFCCC with **two co-chairs** — one from a developed and one from a developing country.
  - Includes **Parties to the Paris Agreement**, financial entities (e.g., GCF, GEF), NGOs, private sector bodies, and observer organizations.
- **Objectives:**
  - To advance understanding of **Article 2.1(c)** (making finance flows consistent with climate-resilient, low-GHG pathways).
  - To ensure complementarity with **Article 9**, which mandates financial support from developed to developing nations.
  - To build consensus on **operationalising Article 2.1(c)** in a just, equitable manner without weakening existing finance obligations.
- **Key Features (2024–2025 Phase):**
  - At least **two workshops per year**, organized by the UNFCCC Secretariat under co-chair guidance.
  - Co-chairs ensure **inclusive, participatory, and transparent dialogue** with balanced Global North–South representation.
  - **Annual reports** and workshop-specific documents to be prepared and submitted to the Conference of Parties.
  - Open **call for submissions** by Parties, financial bodies, private sector, and NGOs to shape the dialogue content.
  - Strengthens trust, clarity, and implementation roadmap toward aligning **climate finance with global net-zero targets**.
- **Significance:**
  - Directly supports Paris Agreement's long-term goals by focusing on systemic transformation of global finance.
  - Encourages private sector engagement in climate solutions, bridging gaps beyond public finance mechanisms.
  - Enables developing countries' concerns on equity and climate justice to remain central in implementation.

Topics: Renewable Energy

HYDROGEN-POWERED DRIVING POWER CAR

Context: India successfully tested its first hydrogen-powered Driving Power Car at the Integral Coach Factory (ICF), Chennai.

- This move is part of the government's larger vision to introduce 35 hydrogen trains under the 'Hydrogen for Heritage' scheme.

About Hydrogen-powered Driving Power Car:

- **What is a Hydrogen Train?**
  - A hydrogen train is powered by hydrogen fuel cells, which generate electricity through a chemical reaction between hydrogen and oxygen, emitting only water and heat.
- **Developed By:** Integral Coach Factory (ICF), Chennai, under Indian Railways, with technical oversight from Northern Railways.
- **Objective:** To replace diesel locomotives with eco-friendly hydrogen alternatives, especially on heritage and non-electrified routes, and reduce railways' carbon footprint by 2030.
- **How It Works?**
  - Hydrogen fuel cells convert hydrogen into electricity to power traction motors. Batteries store excess energy, and regenerative braking enhances efficiency.
- **Key Features:**
  - **Power Capacity:** 1200 HP — world's most powerful hydrogen train engine.
  - **Coach Configuration:** 10-car rake vs. global average of 5.
  - **Emissions:** Zero-emission and produces only water vapour.
  - **Cost Efficiency:** ₹80 crore/train and ₹70 crore/route for infrastructure.
  - **Pilot Route:** Jind–Sonipat (Haryana) selected for initial operations.
- **Significance:**
  - **Global Leadership:** Puts India among global pioneers in hydrogen rail technology.
  - **Net-Zero Vision:** Supports Indian Railways' 2030 decarbonisation target.
  - **Green Economy Push:** Can extend to trucks, tugboats, and heavy industry.

ETHANOL BLENDED PETROL PROGRAMME

Context: India has achieved 20% ethanol blending in petrol by 2025—five years ahead of the original 2030 target. This milestone was announced by Union Petroleum Minister.

About Ethanol Blended Petrol Programme:

- **What is the EBP Programme?**
  - The **Ethanol Blended Petrol (EBP) Programme** aims to **blend ethanol with petrol** to reduce reliance on fossil fuels, enhance energy self-sufficiency, and lower carbon emissions.
- **Launched & Ministry Involved**
  - **Launched in 2003**, scaled up post-2014.
  - Implemented by the **Ministry of Petroleum and Natural Gas**, in coordination with the Ministry of Food Processing and Ministry of Agriculture.
- **Targets:**
  - **Original target:** 20% blending by **2030** (National Policy on Biofuels 2018).
  - **Achieved:** 20% blending in **2025**, **5 years early**.
- **Objectives:**
  - **Reduce crude oil imports**, thereby saving foreign exchange.
  - **Support farmers** by using surplus sugarcane and grains.
  - **Promote clean fuels** for climate action.
  - **Boost the domestic ethanol industry** and create rural jobs.
- **Key Features:**
  - Ethanol sourced from **sugarcane juice, B-molasses, damaged grains**.
  - **OMCs (Oil Marketing Companies)** procure ethanol at pre-fixed prices.
  - Recent Cabinet hike in ethanol procurement prices for **Ethanol Supply Year 2024–25**.

- Dedicated ethanol distilleries and storage infrastructure being promoted under **SATAT** and **PLI** schemes.

- **Significance:**
  - Helps meet **India's Paris Climate targets** and **ethanol roadmap** (NITI Aayog).
  - Strengthens India's push for **energy Atmanirbharta** (self-reliance).
  - Reduces air pollution in urban areas and boosts **agro-economy** in rural India.
  - Catalyzes **biofuel innovation** and investment in green energy.

SILICON-PEROVSKITE TANDEM SOLAR CELLS

Context: The Union Minister for MNRE, lauded NCPRE's breakthrough in Silicon-Perovskite Tandem Solar Cells with a record 29.8% efficiency, calling it a game-changer for India's solar future.

About Silicon-Perovskite Tandem Solar Cells:

- **What It Is?**
  - A **tandem solar cell** combines two types of solar materials—**silicon** and **perovskite**—stacked to absorb different parts of the sunlight spectrum. This structure boosts energy conversion efficiency far beyond conventional silicon panels.
- **Developed By:** Developed by **ART-PV India**, a startup incubated at **IIT Bombay**
- **Key Features:**
  - **29.8% efficiency** in a **4-terminal Silicon/ CdTe-Perovskite** configuration
  - Potential to exceed **30% efficiency**, among highest in India
  - Lower production cost and superior energy yield per unit area
- **Applications:**
  - Rooftop solar systems for urban and rural homes
  - Utility-scale solar parks to power smart grids
  - EV charging infrastructure powered by high-efficiency solar units
- **Significance for India:**
  - Supports India's Aatmanirbhar Bharat mission by building indigenous tech.
  - Reduces dependency on imported solar modules, currently dominated by China.
  - Positions India as a global leader in next-gen photovoltaic (PV) innovation.
  - Aligns with India's Net Zero by 2070 goal through cost-effective clean energy solutions.
  - Boosts domestic green tech manufacturing ecosystem with export potential.

BATTERY PASSPORT FRAMEWORK

Context: The Indian government is formulating a Battery Passport framework to enhance the safety, traceability, and export readiness of EV batteries.

- The initiative is being **led by NITI Aayog**, in collaboration with various ministries.

About Battery Passport Framework:

- **What is a Battery Passport?**
  - A **Battery Passport** is a **digital identity** embedded in a **QR code** that stores complete lifecycle information of an electric vehicle battery, including its origin, components, performance metrics, carbon footprint, and end-of-life data.
- **Why is it Needed?**
  - **Fire Incidents:** Recent EV fires exposed battery safety lapses.
  - **Cell Mismatch:** Mixing of battery cells from different years leads to performance risks.
  - **Battery Swapping Readiness:** Swapping requires verifiable, standardised battery info.
  - **Export Compliance:** Aligns India with upcoming EU battery passport regulations
- **Objectives of the Battery Passport Regime:**

- **Ensure EV Safety:** Identify and prevent faulty or mismatched cells.
- **Promote Quality Standards:** Encourage industry-wide compliance and uniformity.
- **Support Exports:** Meet global traceability norms, especially in the **EU and global markets**.
- **Enable Lifecycle Monitoring:** Help users and recyclers know the battery's usage history.
- **Encourage Circular Economy:** Strengthen battery reuse, recycling, and sustainability.

- **Key Features:**
  - **Digital QR Code:** Embedded code offers access to origin, chemistry, performance, and carbon footprint.
  - **Unique Identity for Each Battery:** Like an Aadhaar for batteries—ensures traceability.
  - **Real-Time Tracking:** Data across production, operation, and end-of-life phases.
  - **Standardised Format:** Includes manufacturer data, batch details, and service history.
  - **Data Sharing Protocols:** Controlled access for public, regulators, and recyclers.
  - **Compliance with EU Norms:** Mirrors European Union's battery regulation for 2+ kWh batteries.
- **Significance for India:**
  - **Boosts EV Industry Credibility:** Enhances consumer confidence in Indian EVs.
  - **Drives Make-in-India for EVs:** Facilitates global exports and manufacturing standards.
  - **Improves Regulatory Oversight:** Enables better monitoring of battery safety norms.

Topics: Disaster and management.

KLYUCHEVSKOY VOLCANO

Context: The Klyuchevskoy volcano, the tallest active volcano in the Northern Hemisphere, after a massive 8.8 magnitude earthquake struck off Russia's eastern coast.

About Klyuchevskoy Volcano:

- **What is It?**
  - Klyuchevskoy (also known as Klyuchevskaya Sopka) is a **stratovolcano**, known for its **steep conical shape** and intense volcanic activity.
- **Location:**
  - Situated on the Kamchatka Peninsula, Russia, about **100 km from the Bering Sea**.
  - Part of the **"Ring of Fire"**, a zone of frequent earthquakes and volcanic eruptions.
- **Key Features:**
  - **Height:** 4,750 meters (15,584 feet) and tallest active volcano in Eurasia.
  - **Eruption Record:** First recorded in **1697** and has remained almost **constantly active** since.
  - **UNESCO Status:** A core part of the **Volcanoes of Kamchatka World Heritage Site**.

About Kamchatka Peninsula:

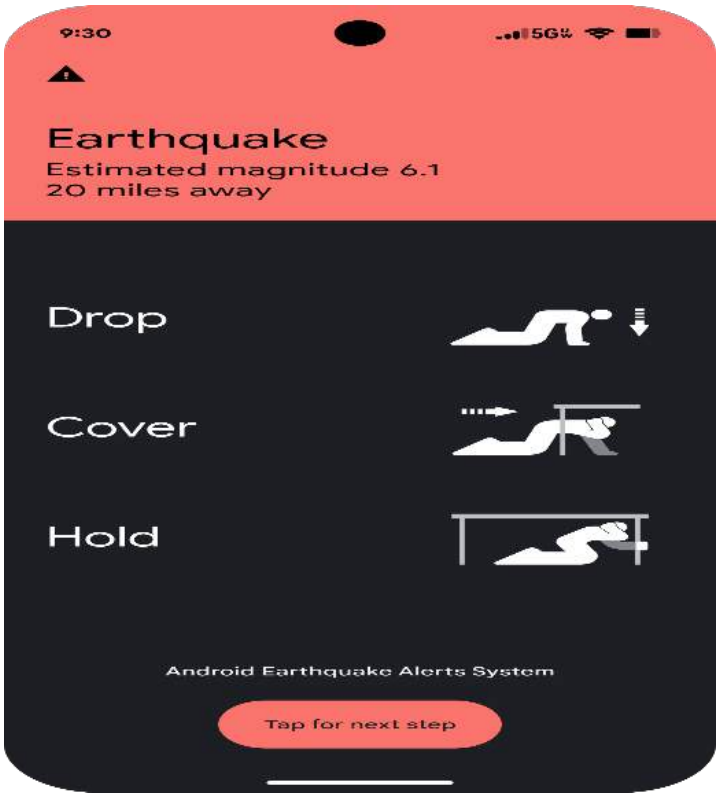
- **What is It?**
  - A large peninsula in far eastern Russia, between the Sea of Okhotsk (west) and Bering Sea/Pacific Ocean (east).
- **Geographic Features:**
  - Spans 1,200 km north–south and 480 km east–west and **total area:** approx. 370,000 sq. km.
  - Home to 127 volcanoes, of which 29 are active, along with geysers, hot springs, and geothermal fields.
  - Dominated by two major mountain ranges: **Sredinny (Central)** and **Vostochny (Eastern)**.
- **Ecological and Climatic Notes**
  - **Tundra vegetation:** mosses, lichens, and Kamchatka alder.
  - Forested lowlands support birch, larch, poplar, and willow.
  - Harsh sub-Arctic climate with cold snowy winters and cool, wet summers.

ANDROID EARTHQUAKE ALERT SYSTEM (AEA)

Context:

Google and UC Berkeley's Seismology Lab have released a new global performance report of the Android Earthquake Alert (AEA) system.

- The system issued successful early warnings in 98 countries.



About Android Earthquake Alert System (*AEA*):

- **What is AEA?**
  - AEA is a **crowdsourced early warning system** that uses the **accelerometers** in Android smartphones to detect early seismic waves (P-waves) and send alerts **before destructive shaking (S-waves)** occurs.
- **Developed By:** Developed by Google in collaboration with the Seismology Laboratory of University of California, Berkeley.
- **How It Works?**
  - **Sensor Activation:** Android phones sense initial P-waves using onboard **accelerometers**.
  - **Crowdsourcing:** Data is sent to Google servers and cross-verified with signals from nearby devices.
  - **Real-time Processing:** If confirmed, servers estimate **epicentre**, **magnitude**, and **distance**.
  - **Alert Dispatch:** Warning is sent to users **before S-waves hit**, allowing 10–60 seconds of preparation.
- **Key Features:**
  - **Dual Alert Types:**
    - '**BeAware**' for mild shaking
    - '**TakeAction**' for strong tremors with override alerts
  - **Global Coverage:** Rolled out from the U.S. in 2020 to **98 countries** by 2024.
  - **User Impact:** Issued **79 crore alerts** and 79% of 1.5 lakh users found alerts highly useful.
  - **Algorithm Tweaks:** Reduced median error in quake magnitude estimates from 0.5 to 0.25.
  - **Accessibility:** Available on all Android devices with opt-in alert settings.
- **Significance:**
  - **Democratises Disaster Warning:** Extends early warning access from 25 crore to 250 crore people.
  - **Zero-Cost Infrastructure:** Utilises existing consumer smartphones—no additional sensors required.
  - **Time-Sensitive Alerts:** Provides crucial seconds for evacuation, safety, or halting transport systems.

TARRAGONA PROVINCE

Context: A massive wildfire in Tarragona province, Catalonia (Spain) has forced over 18,000 people into lockdown, burning nearly 3,000 hectares of forested land.

About Tarragona Province:

- **What It Is?**
  - Tarragona is a **coastal province in northeastern Spain**, forming the **southern part of Catalonia**. Known for its Roman heritage, agricultural economy, and natural landscapes, it is also prone to **Mediterranean wildfires**.
- **Location & Borders**
  - **Country**: Spain
  - **Autonomous Region**: Catalonia
  - Bounded by the **Mediterranean Sea**, offering a long coastal stretch.
- **Geographical Features:**
  - **River:** The **Ebro River** flows through a major valley in the region, critical for agriculture and hydropower.
  - **Mountains:** The **Catalan ranges** and **Pauls Mountains** create rugged terrain, often impeding firefighting efforts.
  - **Natural Parks:** Includes protected areas like the **Ports Natural Park**, now partly affected by the fire.

- **Climate: Mediterranean** – hot, dry summers (fire-prone) and warm, wet winters.
- **Crops:** Cereals, grapes, fruits, olives, hemp, and silk dominate the agricultural landscape.
- **Minerals:** Deposits of **copper, lead, silver**, and quarried **limestone and marble** are found.

- **Cause of the Wildfire:**
  - **Heatwave Trigger:** Spain experienced its **hottest June on record**, creating dry, combustible landscapes.
  - **Wind Factor:** Gusts of **up to 90 km/h (Mistral wind)** accelerated the fire's spread.
  - **Terrain Challenge:** The **rugged topography** and proximity to forests made access and containment difficult.

C-FLOOD APP

Context: Union Jal Shakti Minister inaugurated C-FLOOD, India's first unified web-based flood inundation forecasting platform.

About C-FLOOD App:

- **What is C-FLOOD?**
  - C-FLOOD is a **web-based, real-time flood forecasting system** that provides two-day advance inundation forecasts through flood maps and water level predictions.
- **Developed By:**
  - **Centre for Development of Advanced Computing (C-DAC), Pune**
  - **Central Water Commission (CWC)**
  - In collaboration with **NRSC**, under the **Ministry of Jal Shakti**, **MeitY**, and **DST**.
- **Objective:** To provide an **integrated, high-resolution flood forecasting tool** for early warning, disaster risk reduction, and local-level planning.
- **Key Features:**
  - **2-Day Forecasts at Village Level:** Delivers localized flood maps and water levels down to the gram panchayat level.
  - **Hydrodynamic Modelling:** Uses advanced **2-D simulations** powered by High Performance Computing (HPC) under NSM.
  - **Multi-Basin Coverage:** Currently covers **Mahanadi, Godavari, and Tapi** basins, with more to be added.
  - **Real-Time Data Integration:** Pulls forecast outputs from national and regional models into a unified decision-support portal.
  - **Disaster Portal Integration:** Designed for integration with the National Disaster Management Emergency Response Portal **(NDEM)**.
- **Significance:**
  - Enhances predictive flood risk management and early evacuation planning.
  - Bridges **scientific modelling and field-level response**, improving India's disaster resilience.
  - Promotes **inter-agency collaboration** and real-time validation using satellite and ground data.
  - Sets a benchmark for climate-adaptive water governance in line with Viksit Bharat @2047 goals.

Topics: Role of external state and non-state actors in creating challenges to internal security.

US DESIGNATION THE RESISTANCE FRONT AS FOREIGN TERRORIST ORGANISATION

Context: The US Department of State has officially designated The Resistance Front (TRF) as a Foreign Terrorist Organization (FTO) and Specially Designated Global Terrorist (SDGT) after its role in the Pahalgam terror attack.

About US Designation the Resistance Front as Foreign Terrorist Organisation:

- **What is TRF?**
  - TRF is an **offshoot of Lashkar-e-Taiba (LeT)**, created to present a more secular, indigenous image of Kashmir militancy.
  - It was formed around **2019–2020**, after the revocation of **Article 370** and the decline of LeT's leadership in the Valley.
- **Region of Activity:**
  - TRF operates **primarily in Jammu and Kashmir**, and has claimed several attacks across Kupwara, Sopore, and Pahalgam.

- It uses local and foreign trained cadres, social media propaganda, and infiltration tactics to appear indigenous and modern.

US Designation as FTO and SDGT:

- **What is an FTO?**
  - Under **Section 219 of the US Immigration and Nationality Act**, an FTO label restricts a group's global operations.
  - It criminalizes support from **US persons**, freezes assets, and enables intelligence and financial sanctions.
- **Implications of FTO Status:**
  - **Asset Freezing:** All TRF-related assets under US jurisdiction are immediately blocked.
  - **Legal Sanctions:** Providing funds, training, or resources to TRF becomes a criminal offense in the US.
  - **Global Stigma:** The designation limits TRF's ability to attract recruits or justify its cause on global platforms.
  - **Secondary Sanctions:** Entities doing business with TRF may face restrictions, isolating it further.
  - **India-US Cooperation:** The move underscores growing counter-terror cooperation between New Delhi and Washington.

Topics: Challenges to internal security through communication networks, role of media and social networking sites in internal security challenges, basics of cyber security; money-laundering and its prevention

THE SANCHAR MITRA SCHEME

Context: The Department of Telecommunications (DoT) has expanded the Sanchar Mitra Scheme into a nationwide programme to build digital literacy and cyber safety awareness among citizens.

About The Sanchar Mitra Scheme:

- **What is Sanchar Mitra Scheme?**
  - The **Sanchar Mitra Scheme** is a **volunteer-based digital outreach initiative** launched by the **Ministry of Communications, Department of Telecommunications (DoT)**.
  - It leverages university students as "Sanchar Mitras" to create awareness on telecom safety, **cyber fraud prevention**, and **digital responsibility**.
- **Aim of the Scheme:**
  - Promote **digital literacy** and **cyber hygiene**
  - Bridge the gap between **citizens and government telecom services**
  - Empower youth to become **telecom ambassadors** in their communities
- **Key Features:**
  - **Volunteer Engagement:** University students from telecom, electronics, computer science, and cybersecurity streams are nominated as Sanchar Mitras.
  - **Advanced Training:** Volunteers receive training from **National Communications Academy–Technology (NCA-T)** and DoT Media Wing in **5G, 6G, AI**, cybersecurity, and **EMF radiation safety**.
  - **Community Outreach:** Sanchar Mitras organize **awareness campaigns**, collaborate with NGOs, and educate the public about safe and responsible telecom usage.
  - **Recognition & Incentives:** Exceptional volunteers may get internship opportunities, attend India Mobile Congress, or participate in ITU global forums.
  - **Nationwide Participation:** Already active in Assam, partnering with top engineering institutes like IIT, IIIT, and NIT, with plans for further pan-India expansion.
- **Significance for India:**
  - **Digital Inclusion:** Enhances citizen participation in the digital economy by making people more informed and resilient.
  - **Youth Empowerment:** Leverages the demographic dividend by involving youth in nation-building.
  - **Cybersecurity Awareness:** Helps reduce rising cases of **digital fraud and misinformation**.

Topics: Security challenges and their management in border areas; linkages of organized crime with terrorism.

OPERATION SHIVA

Context: The Indian Army launched Operation SHIVA 2025 to secure the Shri Amarnath Yatra, deploying over 8,500 troops amid rising threats from Pakistan-backed terror outfits in Kashmir.

About Operation SHIVA:

- **What is Operation SHIVA?**
  - **Operation SHIVA** is a **high-altitude annual security operation** led by the **Indian Army** to ensure **safe and smooth conduct** of the Shri Amarnath Yatra in Jammu & Kashmir.
  - It is one of India's most logistically intense military-civilian coordination exercises for **religious tourism safety**.
- **Launched By: Indian Army**, in coordination with the **civil administration**, **Central Armed Police Forces (CAPFs)**, and **disaster response teams**.
- **Objectives:**
  - Prevent terrorist threats and drone attacks during the Amarnath Yatra.
  - Ensure **real-time surveillance, medical readiness, and infrastructure support**.
  - Strengthen coordination among Army, CAPFs, disaster relief, and local administration.
- **Key Features of Operation SHIVA 2025:**
  - **Troop Deployment & Multi-Layer Security:** Over 8,500 soldiers deployed across both Baltal and Pahalgam routes, supported by a multi-tiered counter-terrorism grid.
  - **Drone & Air Surveillance Grid: 50+ C-UAS systems**, PTZ cameras, electronic warfare tools, and **UAV patrols** for real-time monitoring and early threat detection.
  - **Disaster & Infrastructure Preparedness:** Army engineers assigned to repair bridges, widen tracks, and execute landslide mitigation efforts.
  - **Communication & Response Teams:** Signal companies, Quick Reaction Teams (QRTs), bomb disposal squads, and live drone convoy tracking from Jammu to the shrine.
  - **Logistical Readiness:** Emergency rations for **25,000+ people**, **tent cities**, **helicopters on standby**, water stations, bulldozers, and **rescue equipment** pre-positioned.

Topics: Defence related News

OPERATION SHIVSHAKTI

Context: The Indian Army eliminated two terrorists attempting infiltration across the Line of Control in Poonch district under Operation ShivShakti, just days after neutralising three Lashkar-e-Taiba operatives in Operation Mahadev.

About Operation ShivShakti:

- **What is Operation ShivShakti?**
  - It is a **counter-infiltration mission** launched by the Indian Army to foil attempts by terrorists to cross the LoC into Jammu & Kashmir territory.
- **Launched by:** Conducted by the **Indian Army's White Knight Corps** in synergy with **Jammu & Kashmir Police** (JKP), based on precise multi-agency intelligence inputs.
- **Area of Operation:** Executed in the **Degwar sector of Poonch**, particularly near **Maldivalan**, a sensitive zone along the LoC known for infiltration attempts.
- **Objective:** To **prevent cross-border terrorism** by intercepting and neutralising infiltrators before they could reach civilian areas or cause harm to infrastructure.
- **Operational Features:**
  - **Swift and accurate firepower** ensured minimal response time.
  - Recovery of **three weapons**, indicating preparation for high-intensity engagement.
  - Based on **synchronised intelligence inputs** from Army intel and JKP, demonstrating multi-agency coordination.
  - Continuous **search and cordon operations**

underway to identify any remaining threats in the region.

FLIGHT-TESTS OF THE PRALAY QUASI-BALLISTIC MISSILE

Context:
DRDO successfully conducted two back-to-back flight-tests of the Pralay quasi-ballistic missile from Dr. APJ Abdul Kalam Island, Odisha.

About Flight-Tests of the Pralay Quasi-Ballistic Missile:

- **What is Pralay Missile?**
  - *Pralay* is a **surface-to-surface, solid-fuelled, quasi-ballistic missile** developed for **conventional precision strikes**.
  - It has **state-of-the-art guidance and navigation** for pin-point accuracy.
- **Developed By:**
  - Designed and developed by **Research Centre Imarat (RCI)**, Hyderabad, in collaboration with:
    - Defence Research and Development Laboratory (DRDL)
    - Advanced Systems Laboratory (ASL)
    - Other DRDO labs & industry partners like **BDL** and **BEL**
- **Objectives of the Recent Test:**
  - Validate **maximum and minimum range** capabilities under User Evaluation Trials.
  - Confirm performance of subsystems under real conditions before induction.
- **Features:**
  - **Range:** Up to **500 km**
  - **Payload:** Can carry **up to 1000 kg warheads**, including unitary and cluster types
  - **Accuracy:** Equipped with **quasi-ballistic trajectory and in-flight manoeuvrability**
  - **Navigation:** Features **Inertial Navigation System (INS)** and satellite-based guidance
  - **Mobility:** Road-mobile and quick-launch system—vital for tactical response
- **Strategic Significance:**
  - Strengthens India's non-nuclear deterrence posture with high-speed conventional strikes.
  - Enhances India's preparedness for Operation Sindoor-style contingencies.
  - A key asset for the proposed Integrated Rocket Force (IRF)—India's new missile command.

EXERCISE DIVYA DRISHTI

Context: The Indian Army successfully conducted Exercise Divya Drishti in East Sikkim to test artificial intelligence (AI)-based battlefield awareness, real-time surveillance, and next-generation warfare technologies under high-altitude operational conditions.

About Exercise Divya Drishti:

- **What is Exercise Divya Drishti?**
  - A high-altitude technology demonstration by the Indian Army, aimed at validating AI-integrated surveillance, real-time decision-making, and sensor-to-shooter systems under realistic battlefield conditions.
- **Launched by:** Indian Army's Trishakti Corps.
- **Objectives:**
  - Test battlefield digitization tools under extreme Himalayan terrain.
  - Integrate AI sensors with communication systems for seamless data flow.
  - Validate UAV-drone-ground synergy in combat scenarios.
  - Advance doctrines on future warfare, aligning with Atmanirbhar Bharat and the Army's Decade of Transformation roadmap.
- **Features:**
  - **Realistic Deployment:** Ground-based platforms, drones, and UAVs simulated operational missions in East Sikkim.
  - **AI-Enabled Sensors:** Used to generate battlefield intelligence, map terrain, and enhance situational awareness in real time.
  - **Sensor-to-Shooter Linkage:** Enabled instant

data transmission from surveillance devices to command centres and firepower units.
    - **Secured Communications:** Integrated networked communication channels ensured smooth relay of tactical data.
    - **Future-Ready Technologies:** Aligned with indigenous defence development under the Atmanirbhar Bharat initiative.
- **Significance:**
    - **Boosts Tactical Readiness:** Prepares the Army for hybrid warfare across terrains — especially in Himalayan conflict zones.
    - **Supports Self-Reliance:** Promotes Make in India in defence tech, reducing dependency on imports.
    - **Strengthens Decision Speed:** Minimizes command lag through AI-driven situational assessment and instant responses.

KARGIL VIJAY DIWAS

Context: India commemorates the 26th anniversary of Kargil Vijay Diwas (26 July) to honour the Indian Armed Forces' heroic victory in the 1999 Kargil War against Pakistani intruders.

About Kargil Vijay Diwas:

- **What is Kargil Vijay Diwas?**
    - Observed annually on **26 July**, it marks the successful culmination of **Operation Vijay** when India **reclaimed all occupied positions along the Kargil sector**.
    - It is a **national tribute** to the bravery, resilience, and martyrdom of Indian soldiers who defended sovereignty under extreme conditions.
- **Background of the 1999 Kargil War:**
- **Trigger for the Conflict:**
    - Pakistani troops and militants **illegally infiltrated Indian territory** in the **Dras, Batalik, and Kaksar** sectors of Ladakh in May 1999.
    - **Their aim:** sever NH-1A, India's critical highway linking Srinagar to Leh.
- **India's Military Response: Operation Vijay**
    - **Launched in May 1999** as a counter-offensive to reclaim the heights.
    - Indian Army soldiers fought at 16,000+ feet, braving sub-zero temperatures, low oxygen, and constant enemy fire.
    - **Air Power Used:** IAF launched **Operation Safed Sagar**, deploying Mirage-2000s for high-altitude strikes.
    - The war saw **no crossing of the Line of Control**, upholding India's commitment to international law.
- **Major Battlefronts Reclaimed:**
    - **Tololing, Tiger Hill, Point 4875, Khalubar Ridge**, and **Batalik sector** became historic victory symbols.
- **Results of the Kargil War:**
    - **Victory Declared:** By **26 July 1999**, all positions were reclaimed.
    - **Casualties:** 545 Indian soldiers martyred.
    - **Global Impact:** India earned international praise for restraint and military professionalism.
- **Significance of Kargil Vijay Diwas:**
    - **National Security Lessons:** Prompted reforms like the creation of the Chief of Defence Staff (CDS) and boost to joint command structures.
    - **Defence Modernisation:** Spurred investments in mountain warfare gear, surveillance, and indigenous defence tech.
    - **Civil-Military Integration:** Rekindled public trust in the Indian Army and heroes became household names.

UAV-LAUNCHED PRECISION GUIDED MISSILE (ULPGM)-V3

Context:

India successfully conducted flight trials of the UAV-Launched Precision Guided Missile (ULPGM)-V3 at the NOAR test range, Kurnool.

- The missile marks a significant milestone in India's **indigenous drone warfare capabilities**.

About UAV-Launched Precision Guided Missile (ULPGM)-V3:

- **What it is:**
  - A **UAV-Launched air-to-surface precision guided missile**, designed for engaging static and moving targets with minimal collateral damage.
- **Developed by:** DRDO, in collaboration with **Bharat Dynamics Limited (BDL), Adani**, and multiple **MSMEs and start-ups** under the Make in India initiative.
- **Objective:** To enhance India's **autonomous strike capability**, allowing drones to deliver pinpoint attacks without risking pilots or manned aircraft.
- **Variants:**
  - **ULPGM-V1:** Baseline prototype.
  - **ULPGM-V2:** Production-ready variant (standard issue).
  - **ULPGM-V3 (ULM-ER):** Extended-range, improved variant.
- **Key Features of ULPGM-V3:**
  - **Precision Strike Capability:** Fire-and-forget missile with **imaging infrared (IR) seeker**, ensuring day and night target acquisition.
  - **Extended Range Performance:** Effective range: **4 km (day)** and **2.5 km (night)** due to dual-thrust solid propulsion.
  - **Advanced Targeting and Control:** Two-way datalink enables **real-time communication and mid-course updates**, improving accuracy.
  - **Warhead Flexibility:** Equipped with **multiple warhead configurations**, suited for anti-tank, bunker-busting, and soft target missions.
  - **Lightweight UAV Integration: Weight:** 12.5 kg, enabling integration with lightweight drones like Rustom and TAPAS-BH UAVs.
- **Significance for National Defence:**
  - **Strategic Autonomy in UAV Warfare:** Enhances India's UAV-based offensive capabilities, crucial in border surveillance and anti-terror operations.
  - **Boost to Export Potential:** High potential for export to friendly nations under the Defence Export Policy 2020.
  - **Technology Indigenisation Milestone:** Validates DRDO's capacity to develop and trial cutting-edge autonomous weapon systems.

MIG-21

Context: The Indian Air Force will retire its final two MiG-21 Bison squadrons in September 2025, concluding the aircraft's six-decade-long service since its induction in 1963.

About MiG-21:

- **What is MiG-21?**
  - The MiG-21 is a Soviet-designed single-engine supersonic jet fighter known for its speed, agility, and compact frame. It was one of the world's most widely used fighter aircraft during the Cold War.
- **Developed By:**
  - Designed by **Mikoyan-Gurevich Design Bureau (USSR)** in the 1950s.
  - India began licensed production via **Hindustan Aeronautics Ltd (HAL)** in the 1960s.
- **Inducted in India:**
  - First inducted into the Indian Air Force in **1963**.
  - Became the backbone of the IAF during the 1970s to early 2000s.
- **Key Features:**
  - Capable of **Mach 2.0+ supersonic speeds**.
  - Operated in **all-weather conditions** with **multi-role capacity**.
  - Equipped with **air-to-air missiles**, **bombs**, and **cannons**.
  - Later variants like the **MiG-21 Bison** included radar upgrades and improved avionics.
- **Operational Significance:**
  - Played crucial roles in the **1965 and 1971 wars** with Pakistan.
  - Served as India's first **non-Western origin combat aircraft**.
- **Limitations and Controversy:**
  - Known as "flying coffins" due to **over 400 crashes** since the 1970s.
  - Over **200 pilots and 50 civilians** have died due to MiG-related accidents.
  - Despite upgrades, **lack of modern safety features and countermeasures** made them increasingly risky.
  - Retirement repeatedly delayed due to **shortages in IAF fighter strength**.
- **Replacement Plan:**
  - Phased out in favour of indigenously developed Tejas Mk-1A fighter jets.
  - Current IAF strength down to 29 squadrons against a sanctioned strength of 42.5.

SHORT-RANGE BALLISTIC MISSILES AGNI-I AND PRITHVI-II

Context: India successfully test-fired nuclear-capable short-range ballistic missiles Agni-I and Prithvi-II from the Integrated Test Range, Chandipur (Odisha), a day after Akash Prime was tested in Ladakh.

About Short-Range Ballistic Missiles Agni-I and Prithvi-II:

- **What Are They?**
  - Prithvi-II and Agni-I are short-range ballistic missiles (SRBMs) forming the backbone of India's nuclear deterrence strategy.
  - Tested under the supervision of the **Strategic Forces Command** to validate technical and operational parameters.
- **Location:** Integrated Test Range (ITR), Chandipur, Odisha
- **Developed By:** DRDO (Defence Research and Development Organisation).
- Under India's **Integrated Guided Missile Development Programme (IGMDP)**.
- **Objectives:**
  - Validate **combat readiness**, **deterrence reliability**, and **technical accuracy** of India's nuclear delivery systems.
  - Strengthen **second-strike capability** and **credibility of India's strategic arsenal**.
  - Reinforce operational readiness post the **May 2025 Indo-Pak conflict.**
- **Features of Prithvi-II Missile:**
  - **Range:** ~350 km
  - **Payload Capacity:** Up to 500 kg.
  - **Warhead Types:** Conventional and nuclear.
  - **Guidance:** Advanced inertial navigation with high accuracy.
  - **Platform:** Road-mobile launcher for flexible deployment.
  - **Speed:** Mach 1+
- **Features of Agni-I Missile:**
  - **Range:** 700–900 km.
  - **Payload Capacity:** Up to 1,000 kg.
  - **Warhead Types:** Conventional and nuclear.
  - **Accuracy:** High accuracy with sophisticated guidance systems.
  - **Induction:** Deployed in the Indian Army since early 2000s.
  - **Role:** Critical part of **India's minimum credible deterrence.**

AKASH PRIME MISSILE SYSTEM

Context:

India successfully conducted a high-altitude trial of the Akash Prime missile system in Ladakh, marking a major milestone in indigenous air defence capabilities.

About Akash Prime Missile System:

- **What is Akash Prime?**
  - Akash Prime is an **upgraded version** of the Akash Surface-to-Air Missile (SAM) developed by **DRDO**. It is specially designed to perform in **high-altitude, low-oxygen environments**, enhancing India's air defence in mountainous terrains.
- **Developed by:**
  - Defence Research and Development Organisation (DRDO)
  - In partnership with Bharat Dynamics Limited (BDL) and Bharat Electronics Limited.
- **Objective:** To **neutralize aerial threats** such as drones, enemy aircraft, and cruise missiles at high altitudes, particularly along **India's sensitive border areas** like Ladakh and Sikkim.
- **Key Features:**
  - **Altitude Capability:** Proven performance at 15,000 ft during trials in Ladakh.
  - **Seeker Technology:** Indigenous active radar seeker ensures precise target lock.
  - **Mobility:** Mounted on mobile platforms for quick, terrain-flexible deployment.
  - **Guidance:** Hybrid system with command guidance + terminal active homing.

- **Speed & Range:** Travels at Mach 2.5 with a maximum strike range of 30 km.
- **All-Weather Performance:** Functions reliably in extreme cold and low-density air.
- **Kill Probability:** 88% (single missile); up to 98.5% in dual-salvo mode.

- **Significance in Indian Defence:**
  - **High-Altitude Operations:** Tailored for India's mountainous border zones (e.g., LAC).
  - **Boosts Self-Reliance:** Entirely indigenous system under Aatmanirbhar Bharat mission.
  - **Cost-Effective Solution:** Saves import costs and enhances local defence production.

AH-64E APACHE HELICOPTERS

Context:
India is set to receive the first batch of AH-64E Apache attack helicopters from the US after a 15-month delay.

- The helicopters will be deployed at **Jodhpur** for border security operations

About *AH-64E Apache Helicopters*:

- **What is AH-64E Apache Helicopter?**
  - The AH-64E Apache is a multi-role combat helicopter developed by Boeing, built for **high-intensity warfare**, especially in **network-centric and multi-domain environments**. It is one of the most advanced and lethal attack helicopters in the world.
- **Developed By:**
  - **Manufacturer:** Boeing, USA
  - **Inducted by US Army:** Since 1984 (Apache AH-64A)
- **Key Features:**
  - **Sensor-Driven Targeting**: Equipped with **Longbow radar**, thermal imaging, and night vision; detects 256 targets, prioritises 16 threats in seconds.
  - **Advanced Weaponry**: Armed with 30mm chain gun, 70mm rockets, and AGM-114 Hellfire missiles for anti-Armor and precision strikes.
  - **All-Weather, All-Terrain Ready:** Operates in day/night, low visibility, high-altitude and extreme weather conditions.
  - **Enhanced Survivability:** Crash-resistant frame, Defensive Aids Suite, redundant systems, and IR suppression for better battlefield survivability.
  - **Extended Reach:** Wing-mounted fuel tanks enable longer endurance and persistent presence in large conflict zones.
- **Strategic Significance for India:**
  - **Boost to Border Security:** Enhances India's strike capability along western borders with Pakistan.
  - **Modernisation of Army Aviation:** Complements existing IAF Apache fleet and adds offensive capability to Army Aviation Corps.
  - **Interoperability with Allies:** Ensures seamless coordination in joint operations with the US and other QUAD forces.
  - **High-Precision, Low-Collateral Warfare:** Ideal for anti-armour missions, counter-terrorism, and close air support.
  - **Symbol of Strategic Defence Ties:** Strengthens India-US military cooperation under foundational defence agreements.

ASTRA BEYOND VISUAL RANGE AIR-TO-AIR MISSILE (BVRAAM)

Context: The DRDO and Indian Air Force successfully test-fired the indigenous Astra Beyond Visual Range Air-to-Air Missile (BVRAAM) with an indigenously developed Radio Frequency (RF) seeker, validating its precision and technological reliability.

About Astra Beyond Visual Range Air-to-Air Missile (*BVRAAM*):

- **What is Astra?**
  - **Astra** is India's first **indigenous Beyond Visual Range Air-to-Air Missile (BVRAAM)** designed for engaging enemy aircraft beyond line-of-sight.
  - It is a key strategic missile system integrated

on fighter aircraft like the Su-30 MKI.

- **Developed by:** Developed by the **Defence Research and Development Organisation (DRDO)** in partnership with the Indian Air Force (IAF) and Hindustan Aeronautics Limited (HAL).
- **Key Features of Astra Missile**
  - **Strike Range:** Capable of hitting aerial targets over 100 km away, making it a long-range engagement weapon.
  - **Radio Frequency Seeker:** Equipped with a fully indigenous RF seeker, enhancing target lock-on capabilities in diverse conditions.
  - **High Manoeuvrability:** Designed for high-speed interception, even against agile fighter jets or UAVs.
  - **Guidance System:** Uses a state-of-the-art navigation and mid-course correction system, ensuring pinpoint accuracy.
  - **Versatility:** Compatible with multiple fighter platforms, including Tejas, Mirage-2000, and MiG-29 (planned upgrades).
- **Significance of Astra Missile:**
  - **Strategic Self-Reliance:** Strengthens India's indigenous capability under Atmanirbhar Bharat in Defence.
  - **Reduces Import Dependency:** Eliminates need for foreign BVRAAMs like **Meteor or AMRAAM**, saving forex and boosting local R&D.
  - **Force Multiplier:** Enhances IAF's **air dominance** in hostile airspace, especially in high-threat zones like the LAC or LOC.

S-400 'SUDARSHAN CHAKRA' AIR DEFENCE SYSTEM

Context: The Ministry of Defence has identified an Indian firm to set up a Maintenance, Repair, and Overhaul (MRO) facility for the S-400 'Sudarshan Chakra' air defence system.

About S-400 'Sudarshan Chakra' air defence system:

- **What is S-400 'Sudarshan Chakra'?**
  - The **S-400 Triumf**, codenamed **SA-21 Growler** by NATO, is a long-range, multi-layered surface-to-air missile system developed by **Russia's Almaz-Antey**.
  - In Indian service, it is named 'Sudarshan Chakra', reflecting its swift and precise defensive power.
- **Developed By:**
  - Almaz-Antey Air and Space Defence Corporation, Russia.
  - Entered Russian service in **2007**, with India procuring it under a **2018 bilateral agreement**.
- **India's Procurement Timeline:**
  - **Deal Signed:** October 2018 for **₹35,000 crore** (approx. $5.4 billion).
  - **Quantity: 5 squadrons** ordered and **3 delivered** till now.
  - Remaining **2 units to arrive by 2026 and 2027**.
- **Purpose of the S-400 in India:**
  - **Neutralise aerial threats** such as fighter jets, ballistic missiles, cruise missiles, and UAVs.
  - Ensure **airspace denial** and deterrence along **western and northern borders**.
  - Offer **strategic cover** to cities, military bases, and critical installations.
- **Key Features of S-400 Sudarshan Chakra:**
  - **Range & Tracking:**
    - Detects threats up to **600 km**.
    - Engages targets at **four different missile ranges**, up to **400 km**.
  - **Multi-Target Capability:**
    - Simultaneously tracks and engages **80 aerial targets**.
    - Counteracts stealth aircraft, drones, hypersonic weapons.
  - **Quick Response:**
    - Full tracking-to-launch cycle within seconds.
    - Guided missiles use active and semi-active radar seekers.
  - **Integrated Components:**
    - Command vehicle, long-range surveillance radar, engagement radar, and launcher trucks.
    - Each squadron includes **16+ vehicles**.
  - **Deployment & Role:**
    - Already deployed in **Pathankot**, **Siliguri Corridor**, and **Western Front**.
    - Played a crucial role during **Operation Sindoor** by intercepting over 15 aerial threats.

INS NISTAR - DIVING SUPPORT VESSEL (DSV)

Context: The Indian Navy will commission INS Nistar, its first indigenously designed Diving Support Vessel (DSV), at Visakhapatnam. This marks a key milestone in India's underwater rescue and maritime self-reliance journey.

About INS Nistar - Diving Support Vessel (DSV):

- **What is INS Nistar?**
  - INS Nistar is India's first indigenously developed Diving Support Vessel (DSV) designed for deep-sea diving, submarine rescue, and underwater operations.
  - It serves as the mother ship for the Deep Submergence Rescue Vehicle (DSRV).
- **Developed by:**
  - **Hindustan Shipyard Limited (HSL), Visakhapatnam**
  - Built under the **Ministry of Defence** with **80% indigenous content**, involving **over 120 MSMEs**.
- **Objectives of INS Nistar:**
  - Support **submarine rescue** operations and emergency evacuations.
  - Conduct **deep-sea saturation and air diving missions**.
  - Enhance India's **underwater operational reach and maritime preparedness**.
  - Reduce dependence on foreign support in **undersea crisis scenarios**.
- **Key Features:**
  - **Large and Powerful Build:**
    - **Displacement:** Over 10,000 tonnes
    - **Length:** 120 metres
    - **Endurance:** 60+ days at sea
  - **Advanced Positioning & Navigation:** Equipped with Dynamic Positioning System for precision in complex underwater tasks.
  - **Diving & Rescue Capabilities:**
    - Houses **saturation diving systems**, air diving chambers, **ROVs**, and **Side Scan SONAR.**
    - Functions as the **mother ship** for DSRVs, enhancing submarine rescue range.
  - **Medical Infrastructure:** Includes operation theatre, ICU, 8-bed hospital, and hyperbaric chambers for diver recovery and treatment.
  - **Multi-Mission Support:** Features **helicopter landing facility** and **15-ton subsea crane** for logistics and salvage operations.
- **Significance:**
  - Strengthens India's Atmanirbhar Bharat initiative in defence shipbuilding.
  - Enhances India's **strategic readiness** in the **Indian Ocean Region (IOR)**.
  - Fulfils a critical capability gap in submarine rescue and maritime disaster response.
  - Symbolically revives the legacy of the earlier Soviet-origin **INS Nistar (1971)**.

MEDIUM ALTITUDE LONG ENDURANCE (MALE) DRONES

Context: India has fast-tracked the ₹20,000 crore procurement of 87 Medium Altitude Long Endurance (MALE) drones from domestic firms to strengthen border surveillance.

About Medium Altitude Long Endurance (MALE) drones:

- **What is a MALE Drone?**
  - MALE (Medium Altitude Long Endurance) drones are **unmanned aerial vehicles (UAVs)** that operate at medium altitudes (up to ~35,000 feet) and are capable of sustained flights for over **30 hours**.
  - They are used for **Intelligence, Surveillance, Reconnaissance (ISR)** and limited combat missions.
- **Developed By:**
  - Under the **Make in India** initiative
  - Previously, such drones were sourced from **Israeli firms**
- **Key Features of MALE Drones:**
  - **Endurance:** Operate for over **30 hours** continuously.
  - **Altitude:** Fly at **35,000 feet** or more.
  - **Payload:** Equipped with EO/IR cameras, radar, and combat modules.
  - **Real-time ISR:** Enables persistent monitoring across terrains.
  - **Indigenous Content:** Over **60% locally manufactured**, reducing import dependency.
  - **Remote Ops:** Controlled via ground stations with secure communication links.
- **Strategic Applications:**

- **Border Surveillance:** Monitor India's land and maritime boundaries with Pakistan, China, and the Indian Ocean.
- **Tri-Services Integration:** Enhances situational awareness across Army, Navy, and Air Force.
- **Maritime Security:** Tracks hostile naval activity and ensures coastal vigilance.
- **Counter-Insurgency:** Offers tactical support in Naxal-affected or insurgency-prone zones.
- **Disaster Response:** Assists in mapping and relief during natural calamities.

- **Significance:**
  - **Boosts Defence Preparedness:** Enhances India's 24x7 eyes in the sky.
  - **Reduces Import Burden:** Shifts reliance from Israeli imports to Indian tech.
  - **Fuels Defence Manufacturing:** Creates an indigenous drone ecosystem.

AKASH AIR DEFENCE SYSTEM

Context:

Ahead of the 17th BRICS Summit, Brazil has expressed interest in purchasing India's Akash Air Defence System, following its successful deployment in Operation Sindoor.

About Akash Air Defence System:

- **What is It?**
  - **Akash** is a **medium-range, mobile surface-to-air missile (SAM) system** developed to neutralize aerial threats in both defensive and offensive operations.
  - It is designed to **protect vulnerable points and areas** from enemy aircraft, drones, and missiles.
- **Developed By:** Defence Research and Development Organisation (DRDO), in collaboration with Bharat Dynamics Limited (BDL) and Bharat Electronics Limited (BEL) under the Make in India initiative.
- **Objectives:**
  - **Enhance India's layered air defence** by filling the gap between short and long-range interceptors.
  - **Intercept and destroy aerial threats** like helicopters, fighter aircraft, cruise missiles, and UAVs.
  - **Ensure rapid deployment** for field and strategic protection, especially in sensitive zones.
  - **Enable autonomous and group target engagement** during simultaneous aerial attacks.
  - **Offer export potential** to boost India's defence diplomacy and indigenous manufacturing.
- **Key Features:**
  - **Range**: 4.5 km to 25 km
  - **Altitude Coverage**: 100 m to 20 km
  - **Speed:** Supersonic (Mach 1.8 to 2.5)
  - **Guidance System:** Command guidance with integrated radar
  - **Mobility:** Mounted on road/rail mobile platforms
  - **Fire Control:** Fully automatic operation with quick reaction capability
  - **Communication:** Encrypted, secure links between combat elements
  - **Electronic Protection:** In-built ECCM (Electronic Counter-Counter Measures) and high jamming immunity
    - **IFF (Identification Friend or Foe)** enabled for operational safety
- **Significance:**
  - **Proven Operational Record**: Successfully neutralized threats during Operation Sindoor, showcasing real-time efficacy.
  - **Strategic Export Potential**: Brazil's interest signals growing demand for Indian defence products in South America.
  - **Self-Reliance in Defence:** Aligns with Aatmanirbhar Bharat and boosts India's stature as a defence exporter.
  - **Versatile Platform:** Suitable for battlefield, coastal, and critical infrastructure defence.
  - **Strengthens Global Partnerships:** Facilitates **joint R&D**, training, and manufacturing partnerships with emerging economies.

DEFENCE ACQUISITION COUNCIL

Context: The Defence Acquisition Council (DAC) approved capital acquisition proposals worth ₹1.05 lakh crore, aimed at enhancing India's defence capabilities through 100% indigenous sourcing.

About Recent Approvals for Defence Procurement:

- **₹1.05 Lakh Crore Indigenous Proposals Cleared:**
  - DAC approved 10 capital acquisition proposals under the Buy (Indian-IDDM) category.
- **Naval Procurement Plans:**
  - AoN accorded for Moored Mines, Mine Counter Measure Vessels, Submersible Autonomous Vessels, and Super Rapid Gun Mounts.
- **₹30,000 Cr QR-SAM Procurement in Pipeline:**
  - MoD likely to finalize procurement of 3 regiments of Quick Reaction Surface-to-Air Missiles (QR-SAM) to boost Indian Army's air defence.
- **Biggest-Ever Helicopter Deal:**
  - Cabinet Committee on Security cleared ₹62,700 crore deal to procure 156 Light Combat Helicopters (Prachand) from Hindustan Aeronautics Ltd (HAL).

About Defence Acquisition Council (*DAC*):

- It is the **highest decision-making body** in the Ministry of Defence for procurement matters.
- **Established**: Formed in **2001**, following the **Group of Ministers Report** on National Security reforms post **Kargil War (1999)**.
- **Ministry:** Under the **Ministry of Defence**, Government of India.
- **Composition:**
  - Chaired by the **defence minister**.
  - Includes **Chief of Defence Staff**, and the **Chiefs of Army, Navy, and Air Force**.
- **Aim:** To ensure time-bound, cost-effective, and capability-driven procurement using allocated budget optimally.
- **Key Functions:**
  - Approves Acceptance of Necessity (AoN) for capital acquisition proposals.
  - Gives in-principle nod to the Long-Term Integrated Perspective Plan (LTIPP) spanning 15 years.
  - Categorises acquisitions under Buy (Indian), Buy & Make, and Make categories.
  - Decides on Transfer of Technology (ToT) and offsets for deals over ₹300 crore.
  - Resolves single vendor procurement issues.
  - Oversees field trial evaluations and performance assessments.

INS UDAYGIRI

Context: The Indian Navy has received INS Udaygiri, the second stealth frigate under Project 17A, built by Mazagon Dock Shipbuilders Ltd (MDL), delivered in a record time of 37 months.

About Project 17A:

- **What is Project 17A?**
  - A series of seven indigenous stealth frigates, developed as a follow-up to the Shivalik-class (Project 17) frigates.
- **Launched under:** Initiated in **2015**, with construction undertaken by MDL, Mumbai and GRSE, Kolkata.
- **Objective:** To **strengthen India's blue water naval capabilities**, with stealth features, indigenous content, and reduced construction timelines using Integrated Construction techniques.

About INS Udaygiri:

- **Built by:** Mazagon Dock Shipbuilders Ltd. (MDL)
- **Legacy:** Named after the decommissioned **INS Udaygiri** (retired in 2007 after 31 years of service)
  - The **first frigate** under **Project 17A** is INS Nilgiri. This is **second frigate** of the Project 17A series.
- **Key Features:**
  - Advanced stealth design with sleek radar-minimizing profile
  - **Equipped with:**
    - Supersonic surface-to-surface missiles
    - Medium-range surface-to-air missiles
    - 76 mm main gun
    - Close-in weapon systems (30 mm & 12.7 mm)
  - **Combined Diesel or Gas (CODOG)** propulsion system with Controllable Pitch Propeller.
  - **Integrated Platform Management System (IPMS)** for automated operations.
  - **Enhanced hull size** – 4.54% larger than previous Project 17 ships.
  - Constructed using **modular block construction and pre-outfitting.**

MAPPING

GHANA

Context:
Prime Minister of India will make a historic two-day state visit to Ghana, the first by an Indian PM in over three decades.

About Ghana:

- **Location:** Situated along the **Gulf of Guinea** in **West Africa**.
- **Capital:** Accra.
- **Neighbouring Countries:** Burkina Faso, Togo, Côte d'Ivoire, and Atlantic Ocea.
- **Geological & Physical Features:**
  - **Mountains & Plateaus:**
    - Dominated by **dissected Precambrian peneplains** with elevations rarely exceeding 900 meters.
  - **Key mountain ranges:**
    - Akwapim-Togo Ranges in the east (Mount Afadjato – highest peak at 885 m).
    - Kwahu Plateau and Gambaga Scarp form major uplands and escarpments.
  - **Rivers & Lakes:**
    - **Volta River System** dominates the landscape:
      - **Lake Volta:** One of the largest artificial lakes globally (8,500 sq. km), created by the **Akosombo Dam**.
      - **Major tributaries:** Black Volta, White Volta, and Oti rivers.
    - **Other important rivers:** Pra, Ankobra, Tano.
  - **Soil Types:**
    - **Lateritic Soils**: Common across the forest and savanna zones.
    - **Ochrosols**: Fertile and well-drained soils found in forest and coastal regions—suitable for agriculture.
    - **Akuse Clays**: Heavy tropical black earths ideal for irrigation-based farming.
    - **Vleisols** and acidic gray earths dominate less fertile coastal savanna zones.

TRINIDAD AND TOBAGO

Context:
Indian Prime Minister has scheduled a historic diplomatic visit to Trinidad and Tobago, marking the first-ever bilateral PM-level visit, intensifying India's engagement with the Global South.

About Trinidad and Tobago:

- **Geographical Location:**
  - **Country:** Trinidad and Tobago, an island nation in the southeastern West Indies.
  - **Capital:** **Port of Spain**, located on Trinidad's northwestern coast.
  - **Neighbouring Countries:** Lies northeast of **Venezuela**, northwest of **Guyana**, separated by the **Gulf of Paria**. (All are maritime boundaries).
- **Main Islands:**
  - **Trinidad:** Larger island, area ~4,800 sq. km.
  - **Tobago:** Smaller island, ~300 sq. km, located 30 km northeast of Trinidad.

  - **Little Tobago:** Tiny island near Tobago, once habitat of the bird of paradise.
- **Mountain Ranges:**
  - **Trinidad**:
    - **Northern Range:** Extension of Venezuela's Andes and Mount Aripo (940 m) is the highest peak.
    - **Central Range:** Contains Mount Tamana (308 m).
    - **Southern Range:** Low hills across the island's southern flank.
  - **Tobago**:
    - Dominated by the **Main Ridge** (~550 m), extending NE–SW into coral plains.
- **Rivers & Swamps:**
  - **Major Rivers:** Ortoire (south), Caroni (north).
  - **Wetlands:** Caroni Swamp, Nariva Swamp – critical biodiversity hotspots.
- **Unique Features:**
  - **Pitch Lake (Trinidad):** Largest natural asphalt deposit.
  - **Mud Volcanoes:** Notably **Devil's Woodyard** from gas and water seepages.
  - **Coral Reefs:** Buccoo Reef in Tobago, renowned for marine biodiversity, now endangered due to tourism and pollution.
- **Climate Highlights:**
  - **Type:** Tropical, humid with sea breeze moderation.
  - **Temperature:** 25°C to 32°C and cooler Jan–Feb, warmer Apr–May & Oct.

RUSSIA OFFICIALLY RECOGNISED THE TALIBAN

Context:
Russia officially recognised the Taliban-led Islamic Emirate of Afghanistan, becoming the first country to do so formally since the regime's 2021 takeover.

About Russia:

- **Location:** Located in **Northern Eurasia**, spanning both **Eastern Europe** and **Northern Asia**.
  - World's **largest country**, covering approx. 17 million sq. km and stretching across 11 time zones.
- **Capital**: Moscow
- **Neighbouring Countries:**
  - Russia shares borders with **16 nations**, the most of any country:
  - Norway, Finland, Estonia, Latvia, Lithuania, Poland (via Kaliningrad), Belarus, Ukraine, Georgia, Azerbaijan, Kazakhstan, Mongolia, China, North Korea
  - **Maritime Boundaries**: Japan (via Sea of Okhotsk), USA (via Bering Strait)
- **Governance Model:**
  - Russia is a **federal semi-presidential republic**.
  - **President:** Vladimir Putin (Head of State)
  - **Prime Minister:** Mikhail Mishustin (Head of Government)
- **Geological & Physical Features:**
  - **Mountain Ranges:**
    - **Ural Mountains**: Divide Europe and Asia.
    - **Caucasus Mountains**: Home to **Mount Elbrus**, the highest peak in Europe.
    - **Altai, Sayan, and Kamchatka Ranges** in Siberia.
  - **Rivers & Lakes:**
    - **Volga River**: Longest river in Europe.
    - **Lena, Yenisei, and Ob Rivers**: Major Siberian rivers draining into the Arctic.
    - **Lake Baikal**: World's deepest and oldest freshwater lake.
    - **Lake Ladoga**: Largest lake in Europe.
  - **Landscapes & Zone:**
    - Includes **tundra, taiga (boreal forest), steppes, and semi-deserts.**
    - Vast **permafrost zones** in Siberia, hindering infrastructure development.
    - Rich in **natural resources**: oil, natural gas, metals, and timber.

ARGENTINA

Context: Prime Minister of India arrived in Buenos Aires on an official visit to Argentina, to enhance cooperation in defence, energy, agriculture, and trade.

About Argentina:

- **Location:** Argentina is in southern South America.
- **Capital:** Buenos Aires
- **Neighbours:** Chile (west), Bolivia and Paraguay (north), Brazil and Uruguay (northeast), and the Atlantic Ocean (east).

Geography of Argentina

- **Mountains:** The Andes along the western edge include Mount Aconcagua (6,959 m), the highest peak in South America.
- **Rivers:** Major rivers include the Paraná, Uruguay, Pilcomayo, Bermejo, and Santa Cruz.
- **Other Features:**
  - **Pampas:** Fertile plains ideal for farming and cattle grazing.
  - **Patagonia:** Cold, windswept region in the south with glaciers and steppe landscapes.
  - **Gran Chaco & Mesopotamia:** Subtropical lowlands with seasonal rivers and wetlands.
  - **Coastline:** About 2,900 miles (4,700 km) along the Atlantic Ocean.

India–Argentina Relations:

- **Diplomatic Ties:** Established in 1949, with growing collaboration in political, economic, and scientific fields.
- **Trade:** Bilateral trade has expanded, especially in agricultural products, pharmaceuticals, and industrial machinery.
- **Energy & Mining:** India is investing in Argentina's lithium reserves—a key resource for electric vehicle batteries.

SEINE RIVER

Context:
For the first time since 1923, France has reopened the River Seine for public swimming, following extensive clean-up efforts ahead of the Paris Olympics.

About Seine River:

- **What it is?**
  - One of Europe's major historic rivers and a vital inland waterway.
- **Located in:** Northern **France**, traversing key regions including **Île-de-France** and Normandy.

Origin and Course:

- **Source:** Rises at **Mont Tasselot** in the **Côte d'Or region of Burgundy** at an altitude of **1,545 feet**.
- **Length:** Extends **780 km (485 miles)**.
- **Mouth:** Empties into the **English Channel** at **Le Havre**.

Geography and Flow:

- Flows **northwest through Paris**, joining several tributaries—**Aube**, **Yonne**, **Marne**, and **Oise**.
- Features **sluggish flow and navigability** due to low elevation gradient (only 80 feet above sea level at Paris).
- Experiences **tidal bore (mascaret)** at estuary, although this has lessened due to dredging.

Economic Significance:

- Major **commercial navigation route**, especially below Paris, linking to **Le Havre** and **Rouen**.
- Connects to **Rhine**, **Belgian**, **Loire**, and **Saône-Rhône** waterways.
- Recent upgrades made the river **swimmable again**, promoting tourism and ecological restoration.

NAMIBIA

Context: Prime Minister visited Namibia, the first Indian PM in 27 years, to sign key agreements including the introduction of UPI and to strengthen India's ties with the Global South.

About Namibia:

- **Location:** Namibia lies in **southwestern Africa**, offering access to the **Atlantic Ocean** and serving as a strategic gateway to the African interior.
- **Capital:** Windhoek.
- **Neighbours:** Angola, Zambia, Botswana, South Africa, Atlantic Ocean.
- **Geological Features**
    - **Major Rivers**: **Kunene, Okavango, Zambezi**, and Orange are the main rivers, flowing along borders and vital for irrigation and regional cooperation.
    - **Namib Desert**: Located along the west coast, it is **hyper-arid**, famous for the **Skeleton Coast** and rich in minerals like **diamonds and uranium**.
    - **Kalahari Desert**: A **semi-arid sandy region** in the east, it merges into savanna grasslands, supporting scattered pastoral activity.
    - **Mountains**: **Brandberg**, at **2,573 m**, is Namibia's highest peak and part of the western escarpment, known for rock art and biodiversity.
    - **Central Plateau**: This elevated zone is Namibia's **agricultural heartland**, housing the **Fish River Canyon** and saline **Etosha Pan**.
    - **Soils**: Fertile soils are found in **Otavi Highlands and Caprivi Strip**, while other areas have **infertile sandy or rocky terrain**.
    - **Climate**: Characterized by **arid to semi-arid** conditions, rainfall is **<50 mm on the coast** and exceeds **600 mm in the Caprivi Strip,** with frequent droughts inland.

BULGARIA

Context:

EU finance ministers have officially approved Bulgaria's entry into the eurozone from January 1, 2026, making it the 21st member of the single currency area.

About Bulgaria:

- **Location:** Southeastern Europe; eastern part of the Balkan Peninsula
- **Capital:** Sofia
- **Neighbours:** Romania, Black Sea, Turkey and Greece, Serbia and North Macedonia.
- **Geographical Features of Bulgaria**
    - **Major River:** The **Danube River** forms Bulgaria's northern border with Romania.
    - It is a key transportation route and supports agriculture, trade, and tourism.
- **Mountains:**
    - Balkan Mountains **(Central Spine)** – Also called **Stara Planina**, they run east-west, dividing Bulgaria into northern and southern regions.
    - **Rila and Rhodope Ranges (South)** – Home to **Musala Peak** (highest in the Balkans) and scenic landscapes, popular for hiking and skiing.
- **Other Natural Landmarks:**
    - **Black Sea Coastline (Eastern Tourism Hub)** – Famous for resorts like **Sunny Beach** and historic cities like **Varna** and **Burgas**.
    - **Sofia Basin (West)** – A fertile lowland where the capital **Sofia** is located, surrounded by mountains.
- **Cultural Crossroad of East and West:**
    - Blends **Slavic, Ottoman, Greek, and Thracian** influences.
    - Known for **Orthodox churches, Ottoman mosques, Roman ruins**,

and diverse **cuisine** (yogurt, banitsa, kebapche).

About Eurozone: The Single Currency Area

- **What it is**?
  - A monetary union of European Union (EU) countries that use the **euro (€)** as their **official currency**.
- **Established**: 1999 (virtual transactions), 2002 (physical euro notes and coins)
- **Governing Institutions**: European Central Bank (ECB), Eurogroup, and national central banks
- **Key Features:**
  - **Single Currency:** Enables seamless cross-border trade and travel within the EU
  - **Monetary Integration:** Coordinated interest rates and inflation targeting
  - **Stability Mechanisms:** Includes bailout frameworks (e.g., ESM) and fiscal oversight
  - **Eligibility Criteria:** Low inflation, stable exchange rates, sound public finances (Maastricht criteria)
  - **Members:** 20 countries before Bulgaria and Croatia was the most recent entrant (2023)

MAHISAGAR (MAHI) RIVER

Context:

A section of the Gambhira bridge near Mujpur in Vadodara, Gujarat collapsed on 9 July 2025, causing multiple vehicles to fall into the Mahisagar River, resulting in nine confirmed deaths.

About Mahisagar (Mahi) River:

- **What It Is?**
  - The **Mahisagar or Mahi River** is one of the **few west-flowing rivers in peninsular India**, revered for its cultural and ecological significance.
- **Origin:** Near **Minda village** in **Dhar district**, Madhya Pradesh
  - Approximately **500 meters** above sea level in the **Vindhya Range**
- **States It Flows Through:** Madhya Pradesh, Rajasthan, and Gujarat.
  - **Mouth of the River:**
  - **Empties into: Arabian Sea** via the **Gulf of Khambhat.**
  - **Mouth Type:** Wide estuary
- **Length and Drainage Basin:**
  - **Total Length**: 583 km
  - **Total Basin Area**: 34,842 sq. km
- **Major Dams on Mahi River:** Mahi Bajaj Sagar Dam (Rajasthan), Kadana Dam (Gujarat), and Wanakbori Weir.
- **Cities and Districts Along the Course:**
  - Dhar, Ratlam (MP)
  - Banswara (Rajasthan)
  - Mahisagar, Vadodara, Kheda (Gujarat)
- **Uniqueness of the Mahi River:**
  - **West-flowing River:** One of the rare rivers in peninsular India flowing westward into the Arabian Sea.
  - **Intersects the Tropic of Cancer twice** — a rare geographic occurrence unique to Indian rivers.
  - **Cultural relevance:** Referred to as **Mahisagar**, worshipped along its banks with several temples nearby.
  - **Biodiversity hotspot:** Supports turtles, crocodiles, and island ecosystems in dam backwaters.

DHOLERA SPECIAL INVESTMENT REGION

Context:

The Ambassador of Japan to India, Mr. Keiichi Ono, led a high-level business delegation to the Dholera Special Investment Region (SIR) to explore strategic cooperation in semiconductors and smart cities.

About Dholera Special Investment Region:

- **What is Dholera SIR?**
  - Dholera SIR is India's **first greenfield smart industrial city**, developed as a **Special**

Investment Region under the Delhi–Mumbai Industrial Corridor **(DMIC)**.
  - It is designed to be a self-sustaining ecosystem driven by advanced manufacturing, digital governance, and sustainable urban living.
- **Location:**
  - Situated **~100 km southwest of Ahmedabad**, Gujarat.
  - Spans over **920 sq. km.**, covering **22 villages** in Dholera taluka, Ahmedabad district.
- **History & Institutional Framework:**
  - Established under the Gujarat SIR Act, 2009.
  - **DSIRDA** (Dholera Special Investment Region Development Authority) oversees planning and land management.
  - Implemented by Dholera Industrial City Development Ltd. (DICDL) — a joint venture between the NICDC Trust (Central Govt) and Govt of Gujarat.
- **Key Features of Dholera SIR:**
  - **Smart Infrastructure & Digitization:**
    - **Integrated Command & Control Centre (ICCC)** for real-time urban management.
    - **Plug-and-play industrial zones**, e-governance portals, and utility integration.
  - **Connectivity & Logistics:**
    - Linked to Ahmedabad via a **6-lane Expressway and MRTS corridor**.
    - **Dholera Greenfield International Airport** under construction with site and environmental clearances.
  - **Economic Sectors Targeted:** Hosts India's **first semiconductor fab** by Tata Electronics and Taiwan's PSMC under the Semicon India Programme.
  - **Urban & Social Planning:** Six **Town Planning Schemes (TPS)** sanctioned to guide phased development.
  - **Sustainability & Livability:**
    - **Platinum-rated industrial smart city** promoting **non-polluting industries**.
    - Aims to generate over **8 lakh jobs** while ensuring high quality of life and environmental stewardship.
- **Significance:**
  - Aligns with India's Vision 2047 for a self-reliant, innovation-driven economy.
  - Acts as a model for future smart and sustainable cities in India.
  - Strengthens India–Japan strategic cooperation in industrial corridors and high-tech investments.

VULNERABILITY OF DELHI-NCR TO EARTHQUAKES

Context:

A 4.4 magnitude earthquake with epicentre in Jhajjar (Haryana) shook Delhi-NCR recently, reviving concerns about the region's high seismic vulnerability.

About Vulnerability of Delhi-NCR to Earthquakes:

- **What is Delhi's seismic risk?**
  - Delhi lies in **Seismic Zone IV**, classified as a **high-damage risk zone** by the Bureau of Indian Standards (BIS).
  - The region is prone to **moderate to strong earthquakes**, with magnitudes reaching **5–6** occasionally and potential for **7+ magnitude events**.
- **How vulnerable is Delhi-NCR?**
  - **Dense population**, unregulated construction, and aging infrastructure make Delhi highly susceptible to earthquake-induced damage.
  - The **National Center for Seismology (NCS)** has highlighted **frequent tremors** from shallow-focus quakes due to nearby active faults.
- **Reasons Behind Earthquake Vulnerability:**
  - **Proximity to Himalayan Frontal Thrust:** Delhi is close to the tectonically active Himalayan belt, where the Indian and Eurasian plates collide, generating deep-seated stress.
  - **Active Fault Lines Across NCR:** Major fault systems include the **Delhi-Haridwar Ridge**, **Delhi-Moradabad Fault**, **Sohna Fault**, and **Mahendragarh-Dehradun Fault**, increasing seismic risk.
  - **Subsurface Weak Zones:** Seismic studies identify **lineaments like the Yamuna and Ganga River faults**, indicating deep crustal weaknesses.
  - **Historical Seismicity Pattern:** Delhi has experienced at least five quakes of 5.5–6.7 magnitude since 1720, indicating recurring seismic events.

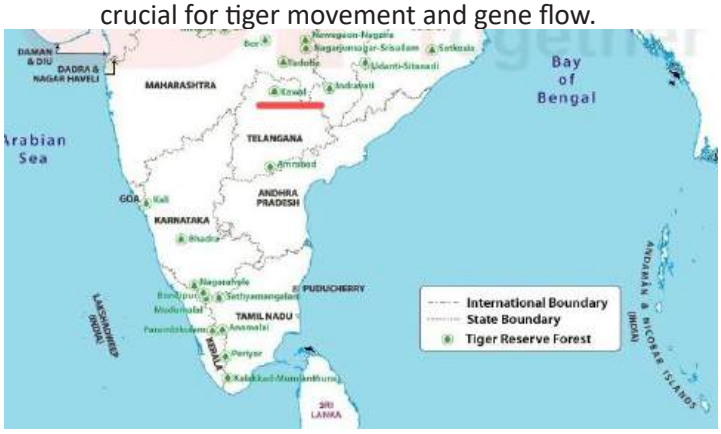
- **Rapid Urbanisation Without Seismic Code Compliance:** Unplanned growth and lack of enforcement of IS-1893 seismic design codes elevate structural vulnerability.

TADOBA ANDHARI TIGER RESERVE

Context:

The National Board for Wildlife (NBWL) has approved coal mining in Maharashtra's Chandrapur district within a vital tiger corridor connecting three key reserves, sparking ecological concerns.

- This area lies between Tadoba Andhari Tiger Reserve, Kanhargaon, and Tipeshwar Wildlife Sanctuaries—crucial for tiger movement and gene flow.



About Tadoba Andhari Tiger Reserve:

- **What It Is?**
  - TATR is one of India's oldest and most prominent Project Tiger reserves, comprising **Tadoba National Park (1955)** and **Andhari Wildlife Sanctuary (1986)**, later merged in **1995**.
- **Location:** Situated in **Chandrapur district**, Maharashtra, it covers **622.87 sq km** including **reserved** and **protected forests**.
  - It falls under the Central Indian Tiger Landscape.
- **Historical Roots:**
  - Named after the tribal deity **Taru**, whose shrine stands by the Tadoba Lake.
  - The region was once a hunting ground for Gond and Maratha rulers before protection laws came into force.
- **Ecological Features:**
  - Home to tigers, leopards, sloth bears, gaurs, and diverse birdlife.
  - Key rivers like **Andhari**, **Era**, and **Tadoba Lake** support the lush tropical deciduous forest.
- **Neighbouring Corridors:** Linked to **Tipeshwar** (Yavatmal) and **Kanhargaon**, forming an essential **tiger dispersal corridor** for maintaining genetic diversity and reducing human-wildlife conflict.

Coal Mining in the News: Durgapur Opencast Project

- **What It Is?**
  - The Durgapur Opencast Mine by **Western Coalfields Ltd** received NBWL clearance to divert 80.77 hectares of forest land within the tiger corridor.
- **Project Features:**
  - Lies between **Tadoba–Kanhargaon–Tipeshwar**, critical tiger linkage.
  - Approval came with Rs. 18.07 crore Wildlife Management Plan prepared by Wildlife Institute of India (WII).
  - Measures include **fencing**, **removal of invasive prosopis**, and **field surveys** to minimize wildlife disruption.

SIERRA LEONE WORLD HERITAGE

Context:

Tiwai Island and Gola Rainforest in Sierra Leone have been declared a UNESCO World Heritage Site, the country's first.

About Sierra Leone World Heritage Site:

- **What is it?**
  - A **natural heritage site** comprising:
    - Tiwai Island Wildlife Sanctuary
    - Gola Rainforest National Park (GRNP)
- **Location:** Situated in **southern Sierra Leone**, along the **Moa River**, near the Liberia border.
- **Unique Features:**
  - **Tiwai Island:**
    - Only **12 sq. km**, yet hosts **11 species of primates**, including endangered western chimpanzees, Diana monkeys, and king colobus monkeys.
    - Acts as a **biodiversity research hub** and **ecotourism model** in West Africa.
  - **Gola Rainforest:**
    - Largest **tropical rainforest** in Sierra Leone.
    - Home to **pygmy hippopotamuses**,

African forest elephants, and hundreds of bird and insect species.
- Key region for **carbon sequestration**, climate regulation, and genetic biodiversity.

About *Sierra Leone*:

- **Capital:** Freetown, located on the Sierra Leone Peninsula, commands one of the world's largest natural harbours.
- **Neighbouring Countries:** Guinea, Liberia, and Atlantic Ocean
- **Key Geographical Features**
  - **Rivers:**
    - Major rivers include Moa, Sewa, Mano, and Rokel.
    - Rivers originate in Fouta Djallon highlands of Guinea and flow southwest.
  - **Mountains:**
    - Mount Bintimani (Loma Mansa) – Highest peak at 6,391 ft (1,948 m).
    - Tingi Hills, Sula Plateau, and Kambui Schists add to rugged terrain.
  - **Coastal & Inland Plains:**
    - Mangrove swamps, lateritic soils, and seasonally flooded Bolilands.
    - Tropical climate with high rainfall and Harmattan winds in dry season.
  - **Natural Resources:**
    - Rich in diamonds, gold, bauxite, and rutile.
    - Agriculture and mining are primary occupations.

PAVANA RIVER

Context: Citizens staged a creative protest in Akurdi (Pune) against the ₹1,500-crore Pavana River Rejuvenation Project, approved recently by the PCMC, citing threats to biodiversity and natural ecology.

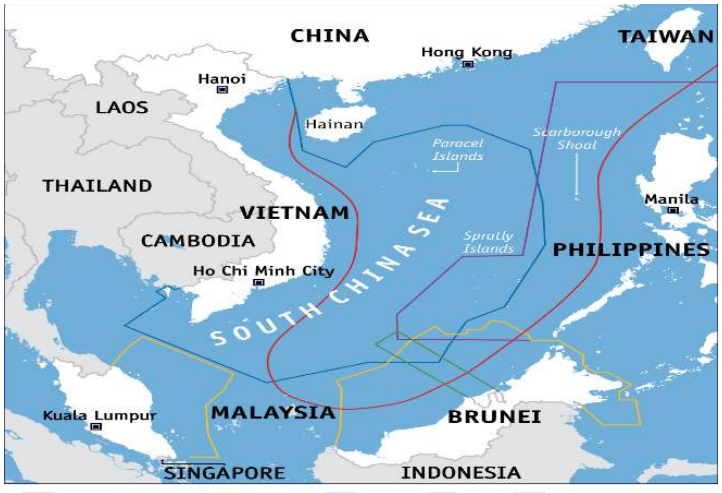
About Pavana River:

- **Origin:** Arises **6 km south of Lonavala** in the **Western Ghats.**
- **Course:** Flows eastward then turns south; passes through Dehu, Chinchwad, Pimpri, Dapodi, and merges with the Mula River near Pune.
- **Confluence Chain:**
  - Pavana → Mula → Mula-Mutha → Bhima → Krishna River.
- **Tributaries of Pavana:**
  - Pavana has **no major left/right-bank tributaries**, but collects rain-fed seasonal streams from **hilly terrain** along its course.
- **Environmental Concerns Raised by Citizens:**
  - **Ecological Degradation:** Over 80% of funds go to construction (walls, walkways), risking loss of native species like birds, turtles, and reptiles.
  - Cultural Erosion: Riverbanks linked to Chinchwad's heritage face threat, sacred trees and local rituals may be displaced.
  - **Cosmetic Urbanisation**: Project prioritizes beautification over river health, masking ecological damage as "rejuvenation".
  - **Pollution & Water Misuse**: Silt, industrial waste pollute the river. Bombay HC flagged illegal diversion of river water for cricket stadium upkeep (2018).

SOUTH CHINA SEA

Context:

The United States Navy will construct two military boat repair facilities in Palawan, Philippines, facing the South China Sea, to strengthen maritime security amid rising tensions with China in the contested region.



About South China Sea:

- **What It Is?**
  - The South China Sea is the largest marginal sea of the western Pacific Ocean, known for

its strategic and economic importance due to rich marine biodiversity, oil reserves, and critical shipping lanes.

- **Location:**
  - Located between **Southeast Asia and China**, it connects to the Pacific via the Luzon Strait and to the Indian Ocean through the Strait of Malacca.
  - Major geographic features include:
    - **China Sea Basin**: Deepest point (~5,000 m).
    - **Palawan Trough** and **Sunda Shelf**: Vital undersea features.
- **Neighbouring Nations:**
  - Direct claimants or stakeholders include: China, Vietnam, Philippines, Malaysia, Brunei, and Taiwan.
  - The sea borders the Philippines (east), Vietnam (west), Malaysia & Borneo (south), and China (north).
- **Disputes & Strategic Importance:**
  - **China claims nearly 90%** of the sea under its "**Nine-Dash Line**," overlapping with EEZs of ASEAN countries.
  - Key flashpoints:
    - **Spratly Islands**, **Paracel Islands**, **Scarborough Shoal**.
    - Frequent standoffs between Chinese and Philippine vessels.
  - The sea is a **major global trade route** and is central to **U.S.–China strategic rivalry**.
- **Rivers Draining into It:**
  - Major rivers:
    - Mekong River (Vietnam)
    - Red River
    - Other smaller rivers from **Malaysia**, **Philippines**, and **China**.

BOLIVIA

Context:

India dispatched 3 lakh doses of Measles-Rubella vaccine to Bolivia amid a disease outbreak, reaffirming its commitment to Global South health diplomacy.

About Bolivia:

- **Location:** Landlocked country in west-central **South America**.
- **Capitals:** La Paz (administrative), Sucre (constitutional).
- **Neighbours:** Borders **Brazil**, **Paraguay**, **Argentina**, **Chile**, and **Peru**.
- **Geographical Extent:** Spans ~1,500 km north-south and ~1,300 km east-west.
- **Physiographic Features of Bolivia:**
  - **Andes Mountains:** Hosts Cordillera Occidental and Cordillera Oriental, with **Mt. Sajama** (6,542 m) as the highest peak.
  - **Altiplano Plateau:** A flat, high plain (~12,000 ft elevation), housing **Lake Titicaca** and (formerly) **Lake Poopó**.
  - **Salt Flats:** Home to **Uyuni Salt Flat**, the world's largest (~10,400 sq. km).
  - **Yungas Region:** Rainy, forested slopes descending from the Andes into valleys.
  - **Amazon Drainage:** Rivers like **Beni**, **Mamoré**, and **Iténez** contribute to the Amazon basin.
  - **Chaco and Oriente:** Hot lowlands in the south and tropical rainforests in the north and east.
- **India–Bolivia Bilateral Relations:**
  - **Vaccine Diplomacy:** India's recent vaccine aid is part of broader **South-South Cooperation** under India's **Development Partnership Programme**.
  - **Health Support:** The consignment included **Measles-Rubella vaccines and supplies** to counter Bolivia's health emergency.
  - **Strategic Engagement:** India and Bolivia share warm ties, especially in multilateral platforms like the **G77**, **NAM**, and **BRICS outreach events**.
  - **Energy & Minerals:** Bolivia is rich in **lithium** and has shown interest in technology and energy collaboration with India.

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MARUNGUR EXCAVATION

Context:

The Tamil Nadu State Department of Archaeology (TNSDA) has completed the Marungur excavation in Cuddalore district, unearthing a habitation-cum-burial site dating from the Iron Age to Early Historic Period.

About Marungur excavation:

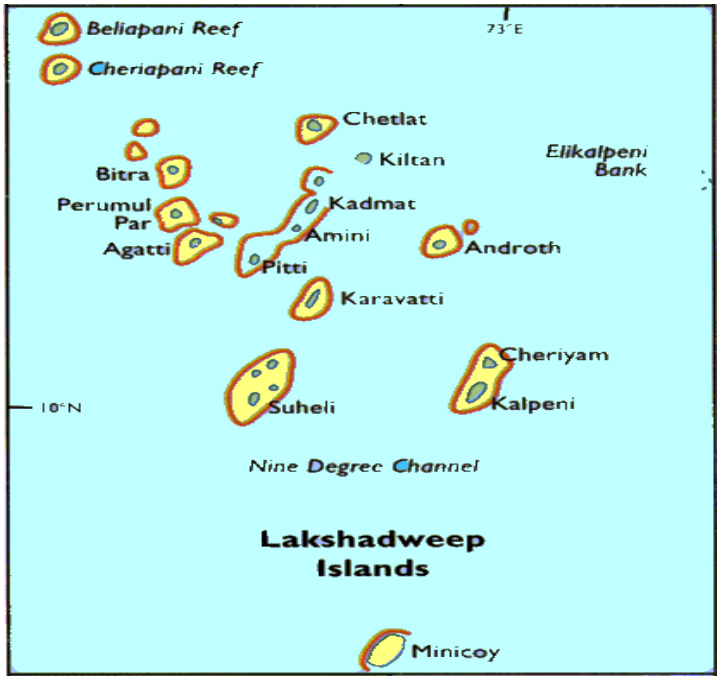
- **What it is?**
  - A multidisciplinary archaeological excavation aimed at uncovering **prehistoric settlements and burial systems** spanning the **Iron Age to Early Historic period**, led by the TNSDA.
- **Location:** Located in **Panruti taluk**, Cuddalore district, Tamil Nadu, between the Thenpennai and Vada Vellar rivers, part of the ancient **Naduvil Mandalam** region.
- **Key Features:**
  - **Habitation mound & burial site:** Both components found together — rare for Tamil Nadu.
  - **Artifacts:** 95 items including Tamil-Brahmi potsherds, terracotta ware, microliths, beads, bone tools, conch shells, iron implements, antimony rods, and Chola-era coins.
  - **Advanced techniques:** Used UAV mapping, LiDAR, AMS carbon dating, and phytolith analysis for precise chronology.
  - **Burial system:** Megalithic urn burials with concentric laterite stone circles, grave goods, iron swords, and jasper beads.
  - **Stratified excavation:** Trench layers showed clear anthropogenic activity up to 6 m, revealing continuous occupation.
- **Significance:**
  - **Chronological breakthrough:** Sheds light on the transition from Iron Age to Early Historic life in Naduvil Nadu.
  - **Epigraphic value:** Rare Tamil-Brahmi inscriptions found on grave pots — among the earliest scripts in Tamil Nadu.
  - **Cultural evolution:** Offers evidence of urban

settlement patterns, trade links (Arikamedu, Poompuhar), and burial rituals.

BITRA ISLAND

Context:

The Lakshadweep administration issued a notification to acquire Bitra Island for defence purposes, triggering strong opposition from locals and political leaders citing constitutional and livelihood concerns.



About Bitra Island:

- **What is Bitra Island?**
  - **Bitra** is the **smallest inhabited island** in the Lakshadweep archipelago.
  - It spans just **0.105 sq. km** in land area, with a **lagoon area of 45.61 sq. km**.
  - It is known for its **ecological significance** and the **shrine of Malik Mulla**, a revered Arab saint.
- **Location and Administrative Control:**
  - Lies at **11°36'N and 72°11'E**, about **483 km west of Kochi**.
  - Falls under the **Union Territory of Lakshadweep**, administered by the Lakshadweep Administration.
- **Geographical and Climatic Features**
  - Features a **coral reef-protected lagoon**, maintaining calm waters even during monsoon.
  - Climate is **tropical and humid**, resembling **Kerala's climate**, with average rainfall of **1600 mm** annually.
  - Population as per 2011 Census: 271 residents, including 105 families.
- **Strategic and Defence Importance:**
  - **Geostrategic Location:**
    - Bitra lies along **key international shipping lanes** in the Arabian Sea.
    - Offers proximity to the **Strait of Hormuz** and **Malacca route**, vital for maritime surveillance.
  - **Defence Proposal:**
    - Proposed for acquisition to build a **defence outpost**, enhancing India's **maritime domain awareness**.
    - Would join **INS Dweeprakshak (Kavaratti)** and **INS Jatayu (Minicoy)** as part of India's naval presence.
  - **National Security Argument:** Cited for strategic positioning and logistical challenges in retaining civilian habitation on a defence-sensitive island.
- **Controversy and Protests:**
  - **Local Opposition:** Locals launched a **"Save Bitra Island" campaign**, including public protests and social media mobilisation.
  - **Legal Framework:**
    - Acquisition to proceed under the **Land Acquisition, Rehabilitation and Resettlement Act, 2013**.
    - A Social Impact Assessment (SIA) has been ordered and survey to be completed within two months.
- **Significance:**
  - Raises tension between national security and indigenous rights.
  - Highlights challenges in securing strategic islands without undermining local identity, culture, and consent.
  - Marks the third such defence expansion in Lakshadweep, reflecting India's growing naval assertiveness in the Indian Ocean Region (IOR).

KARENIA MIKIMOTOI-INDUCED TOXIC ALGAL BLOOM

Context:

A massive Karenia mikimotoi-induced toxic algal bloom off South Australia has killed over 400 marine species, disrupting fisheries and tourism.

- This climate-aggravated bloom, spanning 4,500 sq. km, is being termed a **natural disaster** by state authorities.

About Karenia mikimotoi-induced toxic algal bloom:

- **What is *Karenia mikimotoi*?**
  - A **toxic dinoflagellate species** responsible for **harmful algal blooms (HABs)** globally.
  - Produces **reactive oxygen species and ichthyotoxins**—not directly harmful to humans but deadly to marine organisms.
- **Varieties and Relatives:**
  - Belongs to the **Karenia genus**, also includes **Karenia brevis** (known for Florida red tides and brevetoxins).
  - K. mikimotoi is less toxic to humans, but lethal to fish, shellfish, echinoderms, and marine invertebrates due to oxygen depletion.
- **Key Features:**
  - Lacks a cellulose cell wall (athecate) – **fragile, easily ruptured in water**.
  - Causes **hypoxic or anoxic conditions** as large blooms decompose.
  - Triggers **massive fish kills**, particularly during **marine heatwaves**.
  - Toxins affect fish gills, cause stress, disorientation, and mortality.
  - **No known human illness** from ingestion, but indirect impacts are severe.

About *South Australia*:

- **Geographic Location:**
  - **South-central Australia**, bordered by Western Australia, Northern Territory, Queensland, New South Wales, and Victoria.
  - Southern boundary opens to the **Great Australian Bight** (Southern Ocean).
  - **Capital:** Adelaide
- **Geographical Features:**
  - **Area:** ~983,482 sq. km (4th largest Australian state).
  - **Climate:** Dryest state in Australia and **Mediterranean along coasts**, arid inland.
- **Key Landforms:**
  - **Mount Woodroffe**: Highest peak (1,435 m)
  - **Lake Eyre**: Lowest point, ~15 m below sea level.
  - Nullarbor Plain, Eyre Peninsula, Mount Lofty Ranges, and Flinders Ranges
  - **Major Water Body:** Murray River—the state's only significant perennial river.

UNITED KINGDOM

Context:

Prime Minister of India landed in the UK on a two-day visit to strengthen bilateral ties, with a key focus on the India-UK Free Trade Agreement and issues like extradition and extremism.

About United Kingdom:

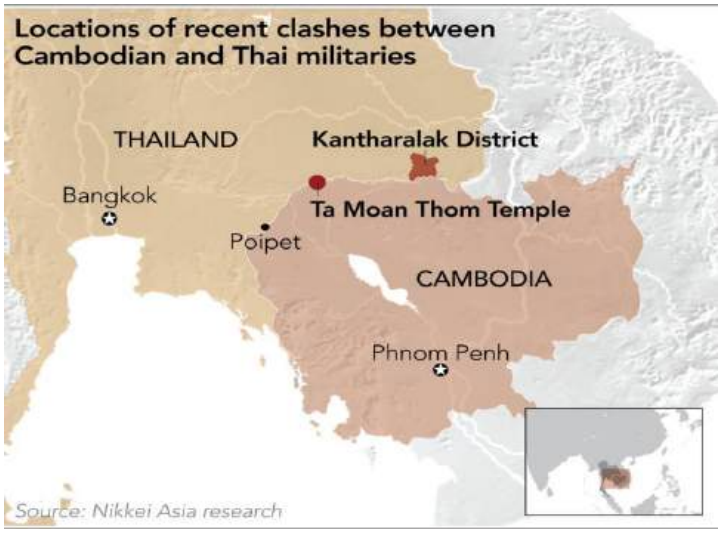
- **What is the United Kingdom?**
  - The **United Kingdom (UK)** is a sovereign island nation comprising **England, Scotland, Wales**, and **Northern Ireland**.
  - It is located **northwest of mainland Europe**, surrounded by the **Atlantic Ocean, North Sea, Irish Sea, and the English Channel**.
- **Capital:** London — a global financial, cultural, and political hub.
- **Political System:** Parliamentary constitutional monarchy.
- **Neighbouring Countries:**
  - Shares land border only with the **Republic of Ireland.**
  - Maritime neighbours include **France, Norway, Belgium**, and **the Netherlands**.
- **UK vs England:**
  - **England** is just one of the four constituent countries of the **United Kingdom**.
  - The term "UK" includes **England, Wales, Scotland**, and **Northern Ireland**, whereas England refers only to its southern part.
- **Physical Features:**
  - **Mountains**
    - **Ben Nevis (Scotland):** UK's highest peak (1,345 m), part of the Grampians; shaped by glaciation.
    - **Cambrian Mountains (Wales):** Volcanic origin, biodiversity-rich;

called Wales' backbone.
    - **Pennines (England):** "Backbone of England", influencing rivers and climate patterns.
  - **Rivers**
    - **Thames:** Lifeline of London, historic trade and transport route.
    - **Severn:** UK's longest river; largest tidal range, key for hydropower.
    - **Clyde:** Engine of Glasgow's shipbuilding and industrial rise.
- **Historical & Strategic Importance:**
  - Former **colonial power** with strong cultural, linguistic, and political influence worldwide.
  - First nation to **exit the EU (Brexit)** in 2020.
  - Founding member of **NATO**, **G7**, **UNSC P5**, and the **Commonwealth**.
- **India–UK Relations:**
  - Strategic partners under Comprehensive Strategic Partnership (2021).
  - Collaboration in trade, defence, innovation, fintech, health, and climate.
  - Talks on Free Trade Agreement aim to enhance $20 billion+ bilateral trade.

TA MUEN THOM TEMPLE REGION

Context:

Fresh hostilities erupted between Thailand and Cambodia near the disputed Ta Muen Thom temple, involving drone surveillance, artillery fire, and Thai airstrikes, amid renewed diplomatic tensions.



About Ta Muen Thom temple:

- **What is Ta Muen Thom?**
  - An **ancient Khmer temple complex** built during the **12th century**, originally dedicated to **Lord Shiva** and later adapted for Buddhist use.
  - Part of the **Prasat Ta Muen group**, which includes **three historical shrines**: Prasat Ta Muen Thom (Hindu), Prasat Ta Muen (Dharma Sala), and Prasat Ta Muen Tot (Hospital Shrine).
- **Who Built It and When?**
  - Constructed under the **Khmer rulers**, particularly **King Udayadityavarman II** and later **King Jayavarman VII** (13th century).
  - Reflects the **Angkorian temple architecture** and socio-religious practices of the Khmer Empire (9th–15th century).
- **Location:**
  - Located on the **Dangrek mountain range**, near **Ban Nong Khanna**, Tambon Ta Mueang, on the Thailand–Cambodia border.
  - Lies on the historic Khmer Highway that linked Angkor (Cambodia) with Phimai (Thailand), making it a strategic mountain pass.
- **Architectural Features:**
  - **Prasat Ta Muen Thom:**
    - Built with **sandstone**, facing south.
    - Contains a **Shiva lingam** with a water outlet channel and cloister.
    - Surrounded by laterite libraries and a pool.
  - **Prasat Ta Muen Tot**:
    - A **hospital shrine** with inscriptions on public health.
    - Houses detailed **stone inscriptions in Khmer-Sanskrit**, recording the appointment of medical personnel.
  - **Prasat Ta Muen (Dharma Sala)**:
    - Likely served as a **pilgrim shelter** along the Khmer trade and pilgrimage routes.
- **Issue Associated:**
- **Ongoing Border Dispute:** Both Thailand and Cambodia claim ownership due to colonial-era border misalignments.
- The International Court of Justice (ICJ) awarded Preah Vihear (nearby) to Cambodia, but surrounding areas remain disputed.

FRANCE RECOGNISE PALESTINE STATEHOOD

Context:

France has formally announced its decision to recognise Palestinian statehood, becoming the first G7 country to do so amid escalating humanitarian concerns in Gaza.

About France recognise Palestine Statehood:

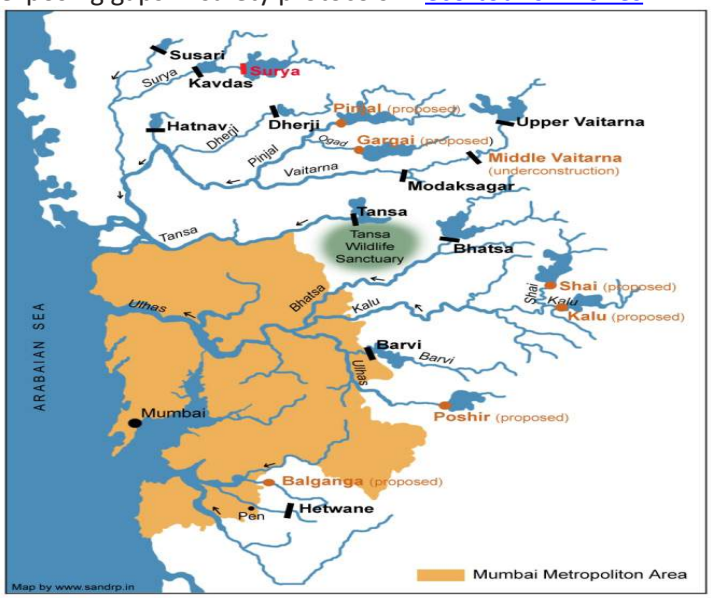
- **Concept and Meaning**
  - Recognition of Palestine means **diplomatic acknowledgment of Palestine as a sovereign state** with rights under international law.
  - It affirms Palestine's right to self-determination, independence, and membership in global institutions like the UN.
- **Countries Recognising Palestine:**
  - As of now, **144 of 193 UN member states** recognise Palestine, including India, Russia, China, and most of the Global South.
  - Recent recognitions include **Spain, Ireland, Norway**, and now **France**, who seek to revive the two-state solution framework.
  - Sweden, Cyprus, and several former Eastern Bloc EU nations also extend recognition.
- **Why is France Recognising Now?**
  - **Humanitarian Crisis in Gaza:** Over 2 million Gazans face man-made starvation, prompting calls for justice and statehood recognition.
  - **Two-State Solution Revival:** France aims to keep the peace process alive, especially before hosting a UN conference with Saudi Arabia.
  - **Strategic Timing:** The decision precedes France's presentation at the upcoming **UN General Assembly**, adding multilateral weight.

About Palestine:

- **Geographic Overview:**
  - **Region:** Middle East.
  - **Territories:** West Bank, Gaza Strip, East Jerusalem (disputed).
  - **Neighbours:** Israel (east and west), Egypt (southwest), Jordan (east), Mediterranean Sea.
- **Historical Background:**
  - **Pre-1947:** Under British Mandate since WWI and Balfour Declaration (1917) supported a Jewish homeland.
  - **1947 Partition Plan:** UN proposed two states — one Jewish, one Arab and only Israel was realized.
  - **1948–67 Wars:** Led to Israel occupying large areas including the West Bank and Gaza.
  - **1988:** Palestine declared independence in Algiers and later gained UN observer status in 2012.
  - **2024–25 Developments:** ICJ deemed Israeli occupation unlawful and Palestine granted expanded rights at the UN.
- **Key Features:**
  - **Political Division:** Governed by the **Palestinian Authority** (West Bank) and **Hamas** (Gaza).
  - **Conflict Hotspot:** Frequent hostilities with Israel over land, resources, and governance.
  - **UN Role:** Supports self-determination, inalienable rights, and peace under Resolution 242 (1967).

KALU RIVER

Context: Over 300 trekkers were rescued in a 7-hour operation near the Kalu River in the Malshej Ghat region, after heavy rainfall caused a sudden rise in river water levels, exposing gaps in safety protocols in eco-tourism zones.



About Kalu River:

- **What is the Kalu River?**
  - The Kalu River is a monsoon-fed river originating in the Kalsubai–Harishchandragad Wildlife Sanctuary, flowing through the Sahyadri ranges and finally draining into the Ulhas River.
- **Origin and Course:**
  - **Source:** Emerges from the Tolar Khind (Pass) near Harishchandragad Peak, close to Pimpalgaon Joga Dam in Pune district.
  - **Course:** Flows westward, forming Kalu Falls near Savarne–Malshej Ghat and traverses

Khireshwar village.
    - **Confluence:** Joined by **Doifodi** at Saralgaon and **Bhatsa River** near Ambivali.
    - **Mouth:** Joins Ulhas River near Atali village. Ulhas then drains into Vasai Bay of the Arabian Sea.
    - **Drainage Basin:** Acts as part of the west-flowing Konkan drainage system.
- **Key Features:**
    - **Geological Transition:** It cascades from the **Deccan Plateau to the Konkan region**, creating dramatic waterfalls like Kalu Falls (1200 ft).
    - **Ecological Zone:** Flows through wildlife-rich forests, including Kalsubai–Harishchandragad Sanctuary, home to leopards, snakes, and endemic flora.
    - **Rainwater Hijacking:** Experts claim the river diverted upper Mula River flows, depriving Ahmednagar and Marathwada of needed rainwater.
    - **Tourist Attraction:** Its scenic beauty draws thousands, but steep terrain, flash floods, and slippery trails make it hazard-prone.
    - **Socio-Hydrological Impact:** Despite high rainfall, Konkan's excess water drains into the sea unused, highlighting the need for water diversion infrastructure.

KAZIRANGA NATIONAL PARK

Context:

Kaziranga Tiger Reserve (KTR) in Assam has recorded the third-highest tiger density in India after Bandipur and Corbett, as per the latest report released by the Chief Minister of Assam on Global Tiger Day 2025.

About Tiger Density in India:

- **What is Tiger Density?**
    - Tiger density refers to the number of tigers per 100 sq. km. It is a key indicator of healthy predator populations and ecological balance.
- **Top 3 Tiger Reserves by Density (2024):**
    - **Bandipur (Karnataka):** 19.83 tigers/100 sq. km
    - **Corbett (Uttarakhand):** 19.56 tigers/100 sq. km
    - **Kaziranga (Assam):** 18.65 tigers/100 sq. km
- **Kaziranga's Tiger Count:** Kaziranga recorded **148 tigers** over 1,307.49 sq. km, up from 104 in 2022, including 27 tigers from the newly surveyed Biswanath Division.

About Kaziranga National Park:

- **Location:** Located in the **Golaghat and Nagaon districts** of Assam, along the floodplains of the Brahmaputra River.
- **Historical Significance:** Established in 1905 on the recommendation of **Mary Curzon**, declared a **UNESCO World Heritage Site in 1985**, and a **Tiger Reserve in 2006**.
- **Ecological Features:** The park lies on the **Eastern Himalayan biodiversity hotspot edge**, with habitats including tall elephant grass, marshes, and tropical forests.
- **Flora:**
    - **Four vegetation types:** alluvial grasslands, savanna woodlands, moist deciduous, and semi-evergreen forests.
    - Notable trees include **Elephant Apple, Cotton Tree, and Indian Gooseberry**.
- **Fauna:** Hosts the world's **largest population of Indian one-horned rhinoceros** (2,200+), along with tigers, elephants, swamp deer, Hoolock gibbons, and migratory birds like **greater adjutant** and **black-necked stork**.

CHILE'S COASTAL EROSION

Context:

At least 10 Chilean beaches are projected to vanish within a decade due to severe coastal erosion, driven by climate change and unregulated development, according to scientists from the Universidad Catolica.

About Chile's Coastal Erosion:

- **What is Happening?**
  - **Severe beach loss:** 86% of monitored beaches along Chile's central and southern coast are shrinking, with 10 beaches critically endangered.
  - **Permanent disappearance likely:** Some tourist beaches like Valparaiso already saw the shoreline vanish last year.
- **Causes of Erosion:**
  - **Climate-induced forces:** Stronger and frequent swells, rising sea levels, and heatwaves are accelerating erosion.
  - **Human activities:** Urbanization, construction near dunes/wetlands, and degradation of river basins reduce natural sand replenishment.
- **Implications:**
  - **Livelihood loss:** Fisherfolk, small coastal businesses, and tourism operators face declining income and displacement.
  - **Ecological degradation:** Saltwater intrusion and collapsing cliffs threaten coastal forests and biodiversity.

About Chile:

- **Continent:** South America, along the Pacific Ocean.
- **Borders:** Argentina, Peru, Bolivia, and Pacific Ocean.
- **Capital:** Santiago.
- **Government:** Multiparty Republic; President – Gabriel Boric.
- **Natural Features:**
  - **Mountains:** Dominated by the Andes and includes Ojos del Salado (22,614 ft, highest active volcano).
  - **Lakes & Glaciers:** Lake District, Southern Ice Cap (2nd largest in the Southern Hemisphere).
  - **10 beaches** facing severe erosion are located along **Renaca**, **Vina del Mar**, **Valparaiso**, and **Puerto Saavedra**
  - **Deserts:** Atacama Desert in the north, one of the driest places on Earth.
  - **Volcanoes:** Active ones like Llaima, Osorno, Copahue.
  - **Rivers:** Short, seasonal rivers fed by Andes' snowcaps.