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CURRENT AFFAIRS MAGAZINE

- Census 2027
- OPEC & OPEC+
- Rare Earth Corridor
- Thrissur Pooran
- SAF blended Aviation fuel

Contents

PRELIMS

POLITY & GOVERNANCE

Contempt of Court

News Context (Recent):

It is prime news ever since the Supreme Court reacted to the treatment of the judiciary in the Class eight textbook brought out by the NCERT. Also, the Supreme Court in February 2026 directed the **UPSC** to initiate **contempt proceedings** against states delaying DGP appointments under the *Prakash Singh* guidelines.

This reinforces that contempt is an active tool for enforcing judicial mandates, not merely punitive.

Key Details & Important Facts:

- **Constitutional Source (Court of Record):**
  - **Article 129:** Supreme Court to be a Court of Record with power to punish for contempt of itself.
  - **Article 215:** High Courts to be Courts of Record with power to punish for contempt of themselves.
- **Statutory Framework: Contempt of Courts Act, 1971** (Defines and limits powers).
- **Definitions [Section 2]:**
  - **Civil Contempt:** Wilful disobedience to judgment/decree/order OR breach of undertaking given to court.
  - **Criminal Contempt:** Publication/scandalizing the court (lowers authority), prejudice/interference with judicial proceedings, or obstruction of justice.
- **Punishment [Section 12]:** Simple imprisonment up to **6 months**, fine up to **₹2,000**, or both. Apology may lead to discharge.

Key Takeaway: Freedom of speech does not permit "scandalizing" the court, especially by senior advocates (officers of the court).

CAPF Bill 2026: Deputation Codification, SC Verdict & Opposition Storm

News Context:

The **Central Armed Police Forces (General Administration) Bill, 2026** was passed by both Houses of Parliament. The Bill creates a unified statutory framework for service conditions of Group 'A' officers across all CAPFs (CRPF, BSF, CISF, ITBP, SSB).

Key Details & Important Facts:

- **Deputation Quotas (Statutory Mandate):**
  - **IG Rank:** 50% posts by deputation (IPS officers)
  - **ADG Rank:** Minimum 67% by deputation
  - **SDG & DG Ranks:** 100% (all posts) by deputation only
- **Legal Coverage:** Umbrella framework for recruitment, promotion, seniority, discipline, and grievance redressal for Group 'A' General Duty officers.
- **The SC Judgment Conflict (May 2025):** The Supreme Court granted **Organised Group 'A' Service (OGAS)** status to CAPF cadre officers and directed the MHA to **"progressively reduce" IPS deputation** up to IG rank within two years. The government's review petition was dismissed in October 2025.
- **Opposition's Core Argument:** The Bill legislatively overrides the SC mandate, creating permanent stagnation and demoting cadre morale.
- **Government's Rationale (Nityanand Rai):**
  - Ends fragmented rules and removes inconsistencies.
  - Strengthens **cooperative federalism** by improving CAPF-State Police coordination.
  - Provides fixed tenures and transparent promotion rules.
- **Parliamentary Passage:** Passed via **Voice Vote** (Lok Sabha & Rajya Sabha).

NCERT Becomes Deemed University

News Context:
The Ministry of Education issued a notification on **March 30, 2026**, declaring the **National Council for Educational Research and Training (NCERT)** as an **institution deemed to be a university**, along with its **six regional institutes**. This follows the University Grants Commission (UGC) approving expert committee recommendations in January 2026. The upgrade empowers NCERT to **offer courses, confer degrees**, and expand into research and innovative academic programmes, moving beyond its traditional role as a school curriculum body.

Key Details & Important Facts:

- **Notification Date:** March 30, 2026
- **New Status: Institution Deemed to be a University** (under Section 3 of the UGC Act, 1956)
- **Scope:** NCERT + its **six Regional Institutes of Education (RIEs)**
- **Key Powers Granted:**
  - Offer courses and programmes
  - Confer degrees (undergraduate, postgraduate, doctoral)
  - Start research and innovative academic programmes
- **Mandatory Compliance Conditions:**
  - **UGC norms** for all academic programmes
  - **No commercial/profit-making activities**
  - **NAAC accreditation** for the institution
  - **National Board of Accreditation (NBA)** rating for programmes
  - Participate in **NIRF rankings** (National Institutional Ranking Framework)
  - Create **Academic Bank of Credits (ABC)** and digital lockers for students
- **Policy Alignment:** Must align with **National Education Policy (NEP) 2020**
- **Offshore/Off-campus:** New campuses permitted only as per UGC norms

First-Ever Removal Motion Against CEC Rejected

Why in News?
In a historic first, the **Lok Sabha Speaker Om Birla** and **Rajya Sabha Chairman CP Radhakrishnan** rejected the opposition's notices seeking the removal of **Chief Election Commissioner (CEC) Gyanesh Kumar** on April 6, 2026. This marked the first-ever attempt in Indian parliamentary history to remove a sitting CEC.

Constitutional and Legal Framework
The removal process for a CEC is governed by:

- **Article 324(5)** of the Constitution: The CEC "shall not be removed from his office except in like manner and on the like grounds as a Judge of the Supreme Court"
- **The Chief Election Commissioner and Other Election Commissioners (Appointment, Conditions of Service and Term of Office) Act, 2023:** Section 11(2) reiterates the same removal procedure
- **Judges (Inquiry) Act, 1968 (Section 3):** Provides the procedural framework. The Speaker (Lok Sabha) or Chairman (Rajya Sabha) has the discretion to either admit or refuse to admit the motion after consulting such persons and considering such materials as deemed fit

Grounds for Removal: "Proven misbehaviour or incapacity" – same as for Supreme Court judges

Procedure for Removal (If Admitted)

1. Motion admitted by Speaker/Chairman
2. Three-member committee investigates the charges
3. If committee finds grounds valid, motion is taken up for consideration in both Houses
4. Requires special majority: majority of total membership of the House + two-thirds of members present and voting

India's Internet Censorship: Inconsistent Blocking Across ISPs

Why in News?
A landmark study tested **294 million domains** across six major Indian ISPs and found that **website blocking is highly inconsistent** – only **1,414 domains** (out of 43,083 blocked) were blocked by all six ISPs. This is the largest study of DNS-level website blocking in India to date.

Legal Framework for Internet Censorship in India

The **Information Technology (IT) Act, 2000** provides the primary legal basis:

- **Section 69A:** Empowers the central government to issue blocking orders to ISPs and intermediaries for reasons of **national security, public order, sovereignty, or friendly relations with foreign states**.
- **Section 79:** Provides safe harbour to intermediaries (including ISPs) subject to compliance with due diligence (including blocking orders).

Licensing conditions: ISP licensing agreements explicitly require ISPs to "block Internet sites […] as identified and directed by the Licensor from time to time." Blocking orders are **confidentially binding** on ISPs.

How Do ISPs Block Websites? (Technical Methods)

- **DNS poisoning (most common):** ISP configures its DNS servers to return a false address for a blocked domain – cheap, requires no deep packet inspection.
- **SNI filtering:** For HTTPS websites, ISPs examine the Server Name Indication (SNI) field and drop connections to blocked domains.
- **HTTP interception (outdated):** Intercept unencrypted HTTP traffic and return a block page (largely obsolete due to HTTPS adoption).

Key Findings of the Study

- **Total blocked domains identified:** 43,083 across six ISPs.
- **Consensus blocks (all 6 ISPs):** Only **1,414 domains** – less than 3.3% of all blocked domains.
- **High-consensus categories:** Terrorism and militancy content – blocks enforced more consistently.
- **Low-consensus categories:** Piracy, peer-to-peer file sharing, pornography, gambling – blocks vary widely across ISPs.
- **Arbitrary blocking:** Almost all ISPs engage in some form of arbitrary blocking.

Madhya Pradesh Forms Panel for UCC Draft Bill

Why in News?

- Madhya Pradesh Government set up a 6-member panel led by Justice Ranjana Prasad Desai to draft a Uniform Civil Code Bill within 60 days, targeting introduction by Deepavali 2026.

Committee Composition

Chairperson

- Justice Ranjana Prasad Desai – retired Supreme Court judge

Scope of Work

- Study legal, social, and administrative aspects of UCC
- Evaluate models adopted by **Uttarakhand** (first state to implement UCC in 2024) and **Gujarat** (passed UCC Bill in March 2026)
- Suggest framework for regulation and registration of **live-in relationships**, rights and obligations arising from them
- Ensure **protection, equality, and security** of rights of women and children
- Organize **public hearings, consultations** – invite suggestions from public, social/religious organizations, legal/academic experts

Key Considerations for MP

Tribal Population (21% of State)

- MP has significant tribal population protected under **Fifth Schedule** of Constitution
- UCC provisions must take into account social and cultural diversity of tribal communities

Social and Cultural Diversity

- Committee asked to consider social, cultural, and economic perspectives of the state

Constitutional Background

Article 44 (DPSP)

- *"State shall endeavour to secure for the citizens a Uniform Civil Code throughout the territory of India"*

Directive Principles

- Not enforceable by courts but fundamental in governance
- UCC among directives pending implementation

Fifth Schedule

- Administration and control of Scheduled Areas and Scheduled Tribes
- Tribal customary laws have constitutional protection

Anti-Defection Law

Why in News?

The **Aam Aadmi Party (AAP)** has sought the disqualification of three Rajya Sabha MPs who joined the BJP, arguing that their switch violates the **Anti-Defection Law** under the **Tenth Schedule** of the Constitution. The case has revived debate over the controversial **"merger exception"** in the anti-defection framework.

What is the Anti-Defection Law?

- Introduced through the **52nd Constitutional Amendment Act, 1985**.
- Added the **Tenth Schedule** to the Constitution.
- Aims to curb political defections and ensure stability of elected governments.

Grounds for Disqualification

A legislator can be disqualified if:

1. He/she voluntarily gives up membership of a political party.
2. Votes or abstains contrary to the party whip without prior permission.
3. An independent member joins a political party after election.
4. A nominated member joins a party after six months of taking a seat.

The Merger Exception (Loophole)

- Under **Paragraph 4 of the Tenth Schedule**, disqualification does **not apply** if:
  - **At least two-thirds of the members** of a legislature party agree to merge with another political party.
- This provision was retained after the **91st Constitutional Amendment Act, 2003**, which abolished the earlier exemption for "splits" (one-third members).

Why Called a Loophole?

- Political parties often engineer defections in groups to satisfy the two-thirds requirement.
- Enables large-scale party switching while technically avoiding disqualification.
- Critics argue it undermines the spirit of the anti-defection law.

Who Decides Disqualification?

- **Speaker of the Legislative Assembly** or **Chairman of the Rajya Sabha/Legislative Council**.
- Their decisions are subject to **judicial review** as held in the landmark **Kihoto Hollohan v. Zachillhu** case.

Census 2027: India's First Fully Digital Population Enumeration

Why in News?

The Government of India has announced **Census 2027**, which will be the country's **first fully digital census**. It will also be the **first census after the 2011 Census**, following repeated postponements of the 2021 Census. The exercise is expected to leverage mobile applications, self-enumeration facilities, and real-time data validation to improve accuracy and efficiency.

What is the Census?

- Census is the **official and comprehensive enumeration of the population** of a country.
- Conducted under the **Census Act, 1948**.
- Carried out by the **Office of the Registrar General and Census Commissioner of India (RGI)** under the Ministry of Home Affairs.
- Traditionally conducted every **10 years (decennial census)** since 1881.

Key Features of Census 2027

1. First Fully Digital Census

- Data collection through **mobile applications and digital devices**.
- Enumerators will use smartphones/tablets instead of paper schedules.
- Real-time monitoring and data validation.

2. Self-Enumeration Facility

- Citizens can submit census details online through a dedicated portal.
- Intended to reduce enumeration errors and improve convenience.

3. Geospatial Mapping

- Use of **GIS-based mapping** and geo-referenced enumeration blocks.
- Better integration of demographic and spatial data.

4. Enhanced Data Security

- Digital encryption and secure data storage mechanisms.
- Faster processing and release of census statistics.

Two Phases of Census

Phase I: Houselisting and Housing Census

- Collection of data on housing conditions, amenities, and assets.

Phase II: Population Enumeration

- Collection of demographic, social, economic, and cultural details of individuals.

Significance

- Basis for policy formulation, welfare schemes, and development planning.
- Crucial for:
  - Delimitation of constituencies.
  - Resource allocation.
  - Population projections.
  - Socio-economic indicators.
- Supports evidence-based governance and digital public administration.

Constitutional Amendment Bill Process

News Context:

- The **Constitution (131st Amendment) Bill, 2026** was introduced in Lok Sabha on April 16, 2026, to increase Lok Sabha seats to up to 850 and implement Women's Reservation
- The Bill requires **special majority** and **ratification by at least 15 state legislatures** before presidential assent

Constitutional Basis: Article 368

- **Part XX** of the Constitution deals with amendment procedure
- Parliament has the power to **add, vary, or repeal** any provision following the prescribed process
- **Note:** Certain provisions (e.g., creation of new states, abolition of legislative councils) can be amended by **simple majority** and are not considered "Constitution amendment" under Article 368

Three Types of Amendment Procedures

1. Simple Majority (Not under Article 368)

- **Requirement:** More than 50% of members present and voting
- **Examples:** Admission of new states, creation/abolition of Legislative Councils, Scheduled Areas administration

2. Special Majority of Parliament

- **Requirement:**
  - Majority (more than 50%) of **total membership** of each House
  - **Two-thirds** of members **present and voting** in each House
- **Examples:** Fundamental Rights, Directive Principles, and most other provisions

3. Special Majority + State Ratification

- **Parliament requirement:** Same as special majority above
- **State ratification:** At least **half of the states** (14 out of 28) must ratify by **simple majority**

- **Provisions covered:** Election of President, extent of executive powers of Union/States, Supreme Court and High Court powers, distribution of legislative powers (federal structure)

Key Differences: Constitutional Amendment vs. Ordinary Bill

Feature	Constitutional Amendment Bill	Ordinary Bill
Introduction	Either House	Either House
President's prior permission	Not required	Not required (except Money Bill)
Majority required	Special majority (total membership + 2/3 present)	Simple majority
Joint sitting	Not permitted	Permitted in case of deadlock
State ratification	Required for federal provisions	Not required
President's assent	Must give (cannot withhold)	Can withhold or return

Basic Structure Doctrine (Judicial Review)

- **Kesavananda Bharati case (1973):** Supreme Court held that Parliament cannot amend the **"basic structure"** of the Constitution
- Amendments violating basic structure can be **struck down** by judiciary
- Example: Constitution (99th) Amendment Act, 2014 on NJAC was declared unconstitutional

INTERNATIONAL RELATIONS

Helium Crisis 2026

News Context:

The ongoing **Iran-Israel war** has triggered a global helium supply shock. Iranian missile strikes on Qatar's **Ras Laffan facility** (world's largest LNG plant) in March 2026 forced QatarEnergy to declare **force majeure**, removing ~14% of global helium export capacity.

Since India imports **over 50% of its helium from Qatar** and has **zero domestic production**, the disruption has created acute vulnerability across healthcare (MRI scans), semiconductor manufacturing, and scientific research.

Key Details & Important Facts:

- **What is Helium?** Colourless, odourless, non-toxic, **inert noble gas**; unique cryogenic properties (lowest boiling point: -269°C); **no viable substitutes** in critical applications.
- **Global Supply (Pre-Crisis):** US (largest producer), **Qatar (~34% of global exports)**, Algeria, Russia (sanctioned). Ras Laffan = world's second-largest helium source.
- **India's Vulnerability:**
  - **100% import-dependent** for helium; ~50%+ from Qatar.
  - **Zero domestic production** – traces in natural gas fields (West Bengal, Jharkhand) but below ~0.2% economic threshold; commercial viability 5-10 years away.

- **Typical inventory:** Only **7-10 days** (just-in-time product due to high boil-off rates).

- **Strategic Applications (No Substitutes):**
  - **Healthcare:** MRI scanners require liquid helium to cool superconducting magnets; most Indian MRIs rely on periodic refilling. Shortage risks **magnet quench** (multi-week downtime, costly repairs). Fujifilm has launched zero-helium MRI technology, but adoption is limited.
  - **Semiconductors:** Essential for **wafer cooling** (EUV lithography), leak detection, plasma processes, controlled atmospheres. Each advanced chip generation consumes **more** helium.
  - **Space & Defence:** Rocket fuel tank purging, pressurisation (NASA, SpaceX).
  - **Fibre Optics & Display Manufacturing:** Heat transfer, defect-free drawing.
  - **Research:** NMR spectrometers, cryogenic experiments.
- **Economic Impact:**
  - **Price surge:** 35-50% increase in recent weeks; spot prices **doubled** globally.
  - **Cost pressures** rather than full production disruptions (as of early April).
  - Indian OSAT (Outsourced Semiconductor Assembly and Test) players have **4-8 weeks of buffer inventory** before allocation mode.

OPEC & OPEC+: UAE Exits, 8 Members Hike Output Amid Iran War Crisis

Why in News?

- **United Arab Emirates (UAE)** announced it will leave OPEC and OPEC+ effective **May 1, 2026**
- Eight OPEC+ members (excluding UAE) agreed to increase oil output by **206,000 barrels per day (bpd)** from **May 2026**
- Decisions come amid the **Iran-Israel-US war** (since Feb 28, 2026) and closure of **Strait of Hormuz**

UAE's Exit from OPEC & OPEC+

Effective Date: May 1, 2026

Reason Stated: Greater flexibility to respond to market demand, especially during undersupply caused by war

Underlying Reasons

- Years of friction with **Saudi Arabia** (de facto OPEC leader) over production policy
- UAE wanted to utilise its expanded production capacity; Saudi pushed for supply restraint
- UAE seeking more independent foreign policy in Middle East, diverging from Riyadh's positions
- Direct competition for foreign investment between the two Gulf nations

Significance

- OPEC loses about **15% of its capacity** and one of its most compliant members
- Other members may follow, leading to potential disintegration of the cartel
- Saudi Arabia will have to do "most of the heavy lifting" regarding internal compliance and market management alone

OPEC & OPEC+:

OPEC – Founded 1960 by 5 Nations

- **Organization of Petroleum Exporting Countries** – established in **Baghdad, Iraq** (1960)
- Founding members: **Iran, Iraq, Kuwait, Saudi Arabia, Venezuela**
- Currently **12 member nations** (Qatar left 2019, Indonesia suspended membership)
- Headquarters: **Vienna, Austria** (since 1965)
- Primary objective: **Coordinate and unify petroleum policies** among member countries to ensure stable oil markets

OPEC+ – Formed in 2016 as Strategic Alliance

- OPEC plus **10 non-OPEC oil-producing allies**
- Key non-OPEC members: **Russia, Kazakhstan, Azerbaijan, Oman, Bahrain, Malaysia, South Sudan, Sudan, Brunei, Mexico**
- Formed in **November 2016** in Algiers to address falling oil prices

- Coordination framework: **Declaration of Cooperation (DoC)**
- **JMMC (Joint Ministerial Monitoring Committee)** – monitors compliance and market conditions

Rohingya Refugee Crisis

Why in News?

- A fishing trawler carrying **250-280 people** (Rohingya refugees and Bangladeshi nationals) capsized in the **Andaman Sea** in mid-April 2026 while attempting to reach Malaysia
- Vessel departed from **Teknaf, Cox's Bazar, Bangladesh**; reportedly overcrowded and overwhelmed by rough seas

Who are the Rohingya?

- Muslim minority ethnic group from **Rakhine State, Myanmar**
- Myanmar's **1982 Citizenship Law** rendered them effectively **stateless** – denying basic rights
- Rohingya are not recognized as one of Myanmar's 135 official ethnic groups

The Deadly Sea Crossings

- **Dangerous Route:** ~1,500 nautical miles from Bangladesh to Malaysia in overcrowded, unsafe boats; journeys often stretch beyond 5–7 days due to breakdowns.
- **Rising Death Toll:** UNHCR reports 2025 as the deadliest year.
- **Worsening 2026 Trend:** Over 2,800 departures by mid-April; recent April tragedy signals escalating crisis.
- **Recurring Crisis Pattern:** Similar to 2015 "Boat Crisis," when 6,000–8,000 migrants were stranded after regional crackdowns and delayed rescue responses.

Comparison with Mediterranean Migration Crisis

- **Mediterranean System:** ~28,000 deaths since 2014 (International Organization for Migration), but structured response—Italy's *Mare Nostrum*, EU missions (*Sophia*), Frontex, and Common European Asylum System.
- **Legal & NGO Role:** Hirsi Jamaa v. Italy banned pushbacks; NGOs like Médecins Sans Frontières and SOS Méditerranée conduct large-scale rescues.
- **Andaman Sea Contrast:** No binding framework; 2015 crisis saw thousands stranded; responses remain ad hoc without strong legal accountability or coordination.

The Governance Vacuum in South/Southeast Asia

- **No Legal Framework:** India, Bangladesh, Thailand, Malaysia not part of 1951 Refugee Convention → no binding protection; rescue remains ad hoc.
- **Ground Reality:** Pushbacks and denied disembarkation; smuggling thrives; Bangladesh facing "compassion fatigue" due to declining aid.
- **ASEAN Limits:** ASEAN constrained by non-interference; Five-Point Consensus ineffective amid internal divisions.

Strategic and Geopolitical Dimensions

- **Myanmar Instability:** Arakan Army controls large areas; continued military rule → fragmentation and stalled Rohingya repatriation.
- **China's Role:** Strong influence via trade and projects like Kyaukphyu Port → deeper strategic presence in Bay of Bengal.
- **India's Dilemma:** Balancing security and humanitarian concerns; refugee influx in border states; tougher stance on Rohingya; not part of 1951 Refugee Convention.
- **Bangladesh's Position:** Seeks repatriation via United Nations and Organisation of Islamic Cooperation, but limited leverage without China's support.

India–New Zealand Free Trade Agreement (FTA)

Why in News?

India and New Zealand signed a landmark **Free Trade Agreement (FTA)** on **27 April 2026**, ending over a decade of negotiations. The agreement aims to boost trade, investment, services, and mobility while protecting India's sensitive agricultural sectors.

What is a Free Trade Agreement (FTA)?

- An agreement between two or more countries to reduce or eliminate tariffs and non-tariff barriers on trade.
- Promotes market access, investment flows, and economic cooperation.
- Can cover goods, services, intellectual property, digital trade, and labour mobility.

Key Features of the India–New Zealand FTA

1. Duty-Free Market Access

- New Zealand has granted **100% duty-free access** to Indian exports.
- Benefits labour-intensive sectors such as:
  - Textiles
  - Leather
  - Footwear
  - Gems & Jewellery
  - Pharmaceuticals
  - Engineering Goods

2. Investment Commitment

- New Zealand has committed **USD 20 billion investment** in India over the next 15 years.

3. Protection of Sensitive Sectors

- India protected key sectors such as:
  - Dairy
  - Coffee
  - Sugar
  - Sensitive agricultural products

4. Mobility & Services

- Easier movement of professionals and students.
- New Zealand to provide employment and working-holiday visa opportunities for Indians.
- Includes cooperation in healthcare and traditional medicine services.

Strategic Significance

- Strengthens India's Indo-Pacific economic engagement.
- Diversifies export destinations beyond traditional markets.
- Complements India's FTAs with Australia, UAE, and EFTA nations.
- Enhances supply-chain resilience and economic diplomacy.

SCO Defence Ministers' Meeting 2026

Why in News?

The **SCO Defence Ministers' Meeting 2026** was held under **China's Presidency of the Shanghai Cooperation Organisation (SCO)**. Defence ministers of member states deliberated on regional security, counter-terrorism, extremism, separatism, Afghanistan, and emerging security challenges. India reiterated its commitment to combating terrorism and promoting a rules-based international order.

About the Shanghai Cooperation Organisation (SCO)

- Established in **2001** at Shanghai.
- Evolved from the **Shanghai Five** mechanism (1996).
- A permanent intergovernmental organization focused on:
  - Regional security
  - Counter-terrorism
  - Economic cooperation
  - Connectivity and cultural exchanges

SCO Members

Current members:

- India
- China
- Russia
- Kazakhstan

- Kyrgyzstan
- Tajikistan
- Uzbekistan
- Pakistan
- Iran
- Belarus

Key Issues Discussed

1. Counter-Terrorism

- Strengthening cooperation against terrorism, separatism, and extremism.
- Focus on dismantling terror financing and cross-border terror networks.

2. Regional Stability

- Security situation in Afghanistan.
- Challenges arising from geopolitical conflicts and instability in Eurasia.

3. Emerging Security Threats

- Cybersecurity threats.
- Artificial Intelligence in warfare.
- Information security and hybrid warfare.

India's Stand

- Emphasized **zero tolerance for terrorism**.
- Called for action against countries providing safe havens to terrorists.
- Advocated respect for sovereignty, territorial integrity, and international law.
- Highlighted the need for inclusive connectivity projects that respect sovereignty concerns.

Regional Anti-Terrorist Structure (RATS)

- SCO's principal security mechanism.
- Headquarters: Tashkent.
- Coordinates intelligence sharing and counter-terrorism cooperation among member states.

Strategic Maritime Chokepoints: Global Trade's Vulnerable Bottlenecks

Why in News?

- The ongoing **West Asia crisis (2026)** has seen simultaneous disruptions at **Strait of Hormuz** (Iran-Israel conflict) and **Bab el-Mandeb** (Houthi attacks)
- This has exposed India's vulnerability to chokepoint blockades, with crude oil hitting $115/barrel and the rupee weakening to 94/$

What are Maritime Chokepoints?

- Narrow sea passages critical for global energy and trade
- Control over them offers significant strategic leverage
- Closure can disrupt supply chains, spike oil prices, and trigger global inflation

Major Global Chokepoints

Strait of Hormuz

- Located between **Iran and Oman**; connects Persian Gulf to Gulf of Oman
- **25-30% of global oil** passes through it
- India imports **55% of its crude oil** via this route
- Currently effectively closed due to Iran-Israel-US war

Bab el-Mandeb (Gate of Tears)

- Located between **Yemen and Djibouti**; connects Red Sea to Gulf of Aden
- **12% of global oil** passes through it
- **80% of India's Europe-bound exports** transit this route (via Suez Canal)
- Houthi attacks have made it dangerous for shipping

Strait of Malacca

- Located between **Malaysia, Indonesia, and Singapore**; connects Indian Ocean to South China Sea
- **30% of global trade** passes through it
- **80% of China's oil imports** pass through this strait (the "Malacca Dilemma")
- India's **Andaman and Nicobar Islands** dominate its western entrance

Suez Canal (Egypt)

- Connects **Mediterranean Sea to Red Sea**
- **12-15% of world trade** passes through it
- Fastest maritime route between Asia and Europe

Panama Canal

- Connects **Pacific and Atlantic Oceans**
- Crucial for trade involving the Americas
- Currently facing **climate change-induced water shortages** restricting traffic

Turkish Straits (Bosporus and Dardanelles)

- Connect **Black Sea to Mediterranean Sea**
- Gateway for Russian and Kazakh oil (3 million barrels per day)
- Also critical for grain exports from Russia and Ukraine
- Governed by **Montreux Convention (1936)**

Cape of Good Hope

- Southern tip of **South Africa**
- Not a chokepoint but the **alternative route** when Suez/Hormuz closed
- Adds **two weeks** to transit time

Yellow Line Strategy

Why in News?

- On **April 18, 2026** (two days into the 10-day Israel-Lebanon ceasefire), Israel announced the creation of a buffer zone named the **"Yellow Line"** in southern Lebanon
- This marks only the **second time** Israel has deployed this specific colour-coded strategic construct – first in **Gaza (October 2025)**, now in southern Lebanon

What is the Yellow Line?

Definition

- A **military demarcation and deployment boundary** that effectively bifurcates territory between Israeli military control and local-controlled areas
- Represents a **forward defensive posture** – a static, fortified defence line placed **deep inside hostile territory**

Physical Characteristics (Gaza Deployment)

- Yellow-painted concrete bollards with **3.5-metre-high poles** spaced at **200-metre intervals**
- Fortified permanent sites with elevated earth mounds, radio towers, and heavy troop concentrations

Current Status (Gaza)

- Puts approximately **58% of Gaza Strip** under direct, open-ended Israeli military control
- Area east of the line treated as a **closed military and free-fire zone**

ECONOMY

RoDTEP Scheme 2026

News Context:

In March 2026, the Government of India extended the **Remission of Duties and Taxes on Exported Products (RoDTEP) Scheme** for six months (from April 1, 2026, to September 30, 2026). This decision comes amid global trade disruptions caused by the **West Asia crisis (Iran-Israel-US conflict)**, which has increased sea freight rates and insurance premiums. Notably, the government had earlier restored 100% benefits under the scheme after a temporary reduction to 50%.

Key Details & Important Facts:

- **What is RoDTEP?**
  - Launched: **January 1, 2021** (Replaced MEIS).
  - Implementing Agency: **DGFT** (Directorate General of Foreign Trade) under Ministry of Commerce & Industry.
  - Nature: **Tax neutralization/remission** (Refunds embedded taxes on exported goods). **Not a subsidy**.
- **Coverage of Taxes:** Refunds Central, State, and Local levies not covered under GST or Duty Drawback (e.g., Electricity Duty, Fuel VAT, Mandi Tax, Stamp Duty).
- **WTO Compliance:** Unlike the previous **MEIS** (which was challenged by the US at WTO), RoDTEP is fully compliant with WTO norms (Subsidies & Countervailing Measures Agreement).
- **Latest Extension Details (March 31, 2026):**
  - Extended till **September 30, 2026**.
  - **Rates unchanged:** 0.3% to 3.9% of FOB value.
  - Budget Allocation for 2026-27: **₹10,000 crore** (Revised from proposed ₹21,709 crore).
- **Benefit Mechanism (E-scrip):** Digital credits generated on **ICEGATE** portal. Transferable; usable for paying Basic Customs Duty or sold for cash. Validity extended to **2 years**.

Rare Earth Corridors (2026-27 Budget)

News Context:

The **Union Budget 2026–27** announced the establishment of **dedicated Rare Earth Corridors** in **Odisha, Kerala, Andhra Pradesh, and Tamil Nadu**. These corridors aim to create an integrated domestic ecosystem for **mining, processing, research, and manufacturing** of rare earth elements (REEs). The initiative aligns with **Atmanirbhar Bharat**, **Net Zero 2070**, and **Viksit Bharat @ 2047**, while reducing import dependence for strategic sectors.

Key Details & Important Facts:

- **Announcement:** Union Budget 2026–27
- **Proposed Corridor States: Odisha, Kerala, Andhra Pradesh, Tamil Nadu** (four states)
- **Objective:** Integrated domestic ecosystem for mining, refining, and manufacturing of rare earths
- **Target Sectors:** Electronics, renewable energy, electric vehicles (EVs), defence manufacturing
- **Strategic Goals:**
  - Reduce import dependence for critical minerals
  - Enhance domestic capability in advanced materials value chains
  - Position India as a global player in rare earths
- **Implementation Mechanism:**
  - **Joint Working Group (JWG)** to formulate Standard Operating Procedures (SOPs)
  - JWG includes all stakeholders

RBI Bans Non-Deliverable Derivatives

News Context:
Amidst rising geopolitical tensions (West Asia conflict) leading to a spike in crude oil prices and capital outflows, the Indian Rupee plummeted below 95 against the USD.
To combat speculative attacks and stabilize the currency, the **Reserve Bank of India (RBI)** issued a stringent directive on **April 1, 2026**, prohibiting banks from offering **Non-Deliverable Derivative (NDD)** contracts involving the Indian Rupee.
Key Details & Important Facts:

- **The Move:** RBI barred Authorized Dealers (banks) from offering **Non-Deliverable Forward (NDF)/Derivative** contracts to both resident and non-resident users.
- **What are NDDs/NDFs?** Derivative contracts settled in **cash (USD)** without actual delivery of the Rupee. Traded offshore (Singapore, London), they allow speculation on currency direction.
- **The Problem:** The large offshore NDF market (~$140 billion) was distorting domestic price discovery and encouraging **regulatory arbitrage**. Banks were using onshore dollars to offset short positions in NDFs, fueling the rupee's fall.
- **Supporting Measures:**
    1. **No Rebooking:** Banks cannot rebook any cancelled forex derivative contract, preventing "cancellation and rebook" games.
    2. **Related Parties:** Banned derivative deals with related parties (as per Ind AS 24) to prevent profit shifting.
    3. **Open Position Cap:** Preceded by a cap on banks' Net Open Position (NOP) to $100 million (from 25% of capital).
- **Impact:** The rupee witnessed a sharp rally, posting its biggest single-day gain in over 12 years, rising to **93.10** against the dollar.
- **Legal Backing:** Instructions issued under **Sections 10(4) and 11(1) of FEMA, 1999**.

Black Money in India: ₹41,257 Crore Tax Demand vs. 1% Recovery

News Context:
A decade after the **Panama Papers** (April 4, 2016) exposed global offshore finance, India's tax enforcement has resulted in **₹41,257 crore** in tax and penalty demands under the **Black Money Act, 2015**.
However, actual recovery remains critically low at **₹338 crore** (less than 1%) as of March 2025, highlighting significant enforcement gaps. Investigations into the **Panama, Paradise, and Pandora Papers** alone identified **₹14,636 crore** in undisclosed offshore assets.
Key Details & Important Facts:
Legislative Framework:

- **Black Money (Undisclosed Foreign Income and Assets) and Imposition of Tax Act, 2015** – Enacted July 1, 2015 specifically to target offshore black money
- **Benami Transactions (Prohibition) Amendment Act, 2016** – Enables confiscation of benami property
- **Fugitive Economic Offenders Act, 2018** – Targets economic offenders fleeing India
- **Special Investigation Team (SIT)** on Black Money – Constituted May 2014 under former Supreme Court judges

Key Enforcement Initiatives:
1. NUDGE Campaign (Nov 2024 & Nov 2025):

- Leveraged **Automatic Exchange of Information (AEOI)** data
- Targeted communications to taxpayers with foreign assets
- One phase: **1.57 lakh taxpayers** revised returns, declaring **₹99,882 crore** foreign assets and **₹6,540 crore** foreign income

2. International Cooperation:

- **AEOI** under Common Reporting Standard (CRS) – data from 100+ jurisdictions
- **Switzerland** sharing Indian resident data since 2018 (first exchange Sept 2019)

- **FATCA agreement** with USA (2015)
- **Multilateral Convention** on Mutual Administrative Assistance in Tax Matters

3. Domestic Enforcement:

- **Search & Seizure (2024-25):** 1,437 groups searched, assets seized ₹2,503.73 crore
- **Surveys (2024-25):** 465 surveys, undisclosed income detected ₹30,444 crore
- **GAAR** (General Anti-Avoidance Rules) implemented 2017

ASISSE: India's First Comprehensive Services Sector Survey (2026)

Why in News?

The **National Statistics Office (NSO)**, under the Ministry of Statistics and Programme Implementation (MoSPI), launched the first ever **Annual Survey of Incorporated Services Sector Enterprises (ASISSE)** in **April 2026** (reference year: FY 2024-25). An accompanying user guide titled **"Know Your Survey"** has also been released for transparency and public awareness.

What is ASISSE?

ASISSE is a nationwide annual survey covering **incorporated services sector enterprises** (companies registered under Companies Act, 1956/2013 or LLP Act, 2008). It aims to create a comprehensive database of the services sector, which contributes **more than half of India's GDP** and generates millions of jobs.

Key Highlights

- **Sample size:** Approximately **1.21 lakh enterprises** across all States and UTs
- **Sampling frame:** GSTN database
- **Legal backing:** Collection of Statistics Act, 2008 (amended 2017) and Jan Vishwas (Amendment of Provisions) Act, 2023
- **Data collection:** Secure web-based portal
- **Sectors covered:** Trade, transport, hospitality, IT, education, health, etc.

Why is ASISSE Significant?

- **First dedicated survey** for incorporated services enterprises
- Comparable to **Annual Survey of Industries (ASI)** for registered manufacturing
- Complements **Annual Survey of Unincorporated Sector Enterprises (ASUSE)** for non-agricultural unincorporated sector
- Together, these three surveys provide a **holistic view** of India's non-agricultural economy at state and industry levels

"Know Your Survey" User Guide

- A reader-friendly explainer on survey objectives, coverage, concepts, definitions, and FAQs
- Aligned with **global best practices** in communicating survey design and processes
- Aims to improve data quality, ease compliance, and build public trust in official statistics

E-PRAAPTI Portal

Why in News?

The **Employees' Provident Fund Organisation (EPFO)** is set to launch the **E-PRAAPTI Portal** to help members identify, track, link, and reactivate their **inoperative (dormant) EPF accounts**. The initiative aims to improve transparency, reduce paperwork, and facilitate seamless access to provident fund savings.

What is E-PRAAPTI?

- **E-PRAAPTI** stands for **EPF Aadhaar-Based Access Portal for Tracking Inoperative Accounts**.
- Developed and launched by the **Employees' Provident Fund Organisation (EPFO)**.
- A dedicated digital platform for:
  - Identification of old EPF accounts.
  - Tracking inactive accounts.
  - Linking accounts with the **Universal Account Number (UAN)**.
  - Activation and recovery of dormant accounts.

Key Features

1. Aadhaar-Based Authentication

- Secure login and account verification through Aadhaar.

- Enables members to access old PF accounts even if they are not linked to a UAN.

2. UAN Linking & Profile Updation

- Facilitates seamless linking of dormant accounts with the active UAN.
- Allows correction and updating of member details.

3. Phased Rollout

- **Phase I:** Member ID-based search and retrieval.
- **Phase II:** Expansion to members who do not remember their old Member IDs.

What is an Inoperative EPF Account?

- An EPF account becomes inoperative when:
  - No contributions are received for a prolonged period after leaving employment.
  - The old PF account is not linked to the active UAN.

About EPFO

- Established under the **Employees' Provident Funds and Miscellaneous Provisions Act, 1952**.
- Functions under the **Ministry of Labour and Employment**.
- Administers:
  - Employees' Provident Fund (EPF)
  - Employees' Pension Scheme (EPS), 1995
  - Employees' Deposit Linked Insurance Scheme (EDLI), 1976

RBI Cancels Paytm Payments Bank Licence

Why in News?

- The **Reserve Bank of India (RBI)** cancelled the banking licence of **Paytm Payments Bank Limited (PPBL)** on **April 24, 2026**, effective from close of business that day
- This marks one of the most severe enforcement actions ever taken against a major Indian fintech entity

Reasons for Licence Cancellation

The RBI invoked its powers under **Section 22(4) of the Banking Regulation Act, 1949**, citing four critical failures:

1. Detrimental Conduct (Section 22(3)(b))

- Affairs of the bank were conducted in a manner **detrimental to the interest of the bank and its depositors**

2. Management Integrity (Section 22(3)(c))

- "General character of the management" was found to be **prejudicial to the interest of depositors** and public interest

3. No Useful Purpose (Section 22(3)(e))

- No useful purpose or public interest would be served by allowing the bank to continue

4. Licence Condition Violation (Section 22(3)(g))

- Bank failed to comply with conditions stipulated in its Payments Bank licence

Depositor Protection

Key Assurance from RBI

- Paytm Payments Bank has **enough liquidity** to repay its entire deposit liability upon winding up
- As of March 31, 2025: Customer deposits of **Rs 1,395.22 crore** across wallets, current and savings accounts; total gift instruments of **Rs 33.13 crore**
- During winding up, a liquidator will ensure every depositor is repaid in full

GEOGRAPHY

India's Summer 2026 Outlook

News Context:

The **India Meteorological Department (IMD)** released its seasonal outlook for summer 2026 (April-June), projecting **above-normal temperatures and increased heatwave days** over east, central, and northwest India, while north India is expected to experience a **cooler-than-normal summer**. The forecast also indicates **12% above-normal rainfall in April** but flags the likely emergence of **El Niño** by July, with implications for the upcoming monsoon season.

Key Details & Important Facts:

- **Summer Outlook (April-June 2026):**
  - **Above-normal max temperatures:** East & northeast India, eastern parts of central India, adjoining peninsular regions.
  - **Normal to below-normal max temperatures:** North India (cooler summer).
  - **Increased heatwave days:** East, central, northwest India, and southeast peninsula (coastal Odisha, West Bengal, Tamil Nadu, Puducherry, Andhra Pradesh; parts of Gujarat, Maharashtra, Karnataka).
- **April Rainfall:** Country likely to receive **12% above-normal** rainfall.
- **El Niño Watch:**
  - Forecast suggests emergence of **El Niño** (≥1°C warming in Central Pacific) by **July**.
  - El Niño is historically associated with **weakened monsoon rainfall** in India.
- **Monsoon Forecast:** IMD's initial monsoon outlook expected on **April 15, 2026**.
- **Cooler Summer – Monsoon Link:**
  - Climatologist **Madhavan Rajeevan** noted: cooler landmass reduces thermal gradient, potentially delaying monsoon onset and initial progress.
  - Historical parallels: **2004 and 2014** saw cooler northwest summers followed by **weak monsoon**.
- **March 2026 Observations: 8 Western Disturbances** (vs. normal 5-6) brought **12% excess rainfall**.

SAGAR VANI & SAMUDRA: India's Ocean Information and Early Warning System

News Context:

The Ministry of Earth Sciences (MoES) provided a Lok Sabha update on ocean information services delivered by **INCOIS**. The response highlighted the multi-channel dissemination of **Potential Fishing Zone (PFZ) advisories** and **Ocean State Forecasts** to coastal communities, with specific reference to **Andhra Pradesh (Konaseema district)** and **Odisha (Jagatsinghpur & Puri districts)**, emphasizing last-mile delivery, capacity building, and the **Tsunami Ready** recognition for coastal villages.

Key Details & Important Facts:

- **Nodal Agency: Indian National Centre for Ocean Information Services (INCOIS)** , Hyderabad; under **Ministry of Earth Sciences (MoES)** .
- **Services Provided:**
  - **Potential Fishing Zone (PFZ) Advisories:** Identifies fish aggregation areas to improve catch efficiency.
  - **Ocean State Forecasts (5-day):** Assists mariners with advance planning and maritime safety.
  - **Ocean Hazard Alerts:** Tsunamis, storm surges, high waves, swell surges.
- **Communication Channels:** Multi-channel framework including **SMS, WhatsApp, Telegram, SAMUDRA app, GEMINI (satellite-based), VOIP phones, Common Alert Protocol (CAP)-based SACHET platform**.
- **SAMUDRA Mobile App:** One-stop platform providing real-time alerts, PFZ advisories, and ocean forecasts in local languages.
- **Tsunami Ready Programme:** Implemented in collaboration with **UNESCO-IOC**. Five villages each in **Jagatsinghpur and Puri (Odisha)** recognized as **Tsunami Ready communities**.

- **Reach:** Services available across all coastal States/UTs; directly reaches **~8 lakh fishermen**; capacity building through workshops, mock drills, and awareness campaigns.

India's Doppler Weather Radar (DWR) Network

Why in News?

- Union Minister Dr. Jitendra Singh announced that India's **Doppler Weather Radar (DWR)** network has expanded from **14 operational units (2014) to 50 units (2026)** – an increase of over **250%**
- Covers over **87% of the country**
- **50 more DWRs planned** under **Mission Mausam**

What is Doppler Weather Radar (DWR)?

Definition

- Radar that uses the **Doppler effect** to measure the **velocity and movement** of precipitation particles (rain, hail, snow) and wind
- Provides real-time data on storm structure, intensity, and movement

How it Works

- Transmits pulses of microwave energy into the atmosphere
- Receives reflected signals (echoes) from precipitation particles
- Doppler shift measures particle velocity – determines wind speed and direction

Key Capabilities of Modern DWRs

Dual-Polarization Technology

- Modern radars deployed by IMD are equipped with **dual-polarization** (sends both horizontal and vertical pulses)
- Enables precise identification of **precipitation types**: rain, hail, drizzle, sleet, snow
- Improved rainfall estimation
- Better detection of severe weather events while **minimizing false signals**

Nowcast Services

- Provides highly localised and accurate forecasts for the **next 3 hours**
- Updates every 10-15 minutes
- Detailed inputs on: rainfall intensity, type of precipitation, possibility of hailstorms, **raindrop size**

Applications and Importance

- **Disaster management:** Early warnings enable timely evacuation and preparedness
- **Aviation safety:** Real-time data helps detect turbulence, wind shear, and severe weather
- **Agriculture:** Accurate rainfall forecasts and hail alerts support crop protection
- **Urban planning:** Aids flood control, drainage management, and infrastructure response
- **Public use:** Widespread mobile access to weather updates in daily life
- **Regional cooperation:** Forecasting support strengthens resilience in neighbouring countries

Inland Waterways of India

Why in News?

According to the Ministry of Ports, Shipping and Waterways, cargo movement through India's inland waterways has witnessed significant growth, reflecting the government's efforts to promote **Inland Water Transport (IWT)** as a cost-effective, fuel-efficient, and environmentally sustainable mode of transportation. The development aligns with the goals of **PM Gati Shakti** and multimodal logistics integration.

What are Inland Waterways?

- Inland waterways comprise **rivers, canals, backwaters, creeks, and estuaries** used for navigation.
- They provide an economical mode for transporting bulk cargo and passengers.
- Governed under the **National Waterways Act, 2016**.

Key Institutional Framework

- **Inland Waterways Authority of India (IWAI)**
  - Established in **1986**.
  - Functions under the Ministry of Ports, Shipping and Waterways.
  - Responsible for development and regulation of national waterways.

National Waterways in India

- India has **111 National Waterways** declared under the **National Waterways Act, 2016**.
- Operational waterways are being developed under the **Jal Marg Vikas Project (JMVP)** and other initiatives.

Important National Waterways

National Waterway	Water Body	States
NW-1	Ganga–Bhagirathi–Hooghly River System	UP, Bihar, Jharkhand, West Bengal
NW-2	Brahmaputra River	Assam
NW-3	West Coast Canal	Kerala
NW-16	Barak River	Assam

Major Government Initiatives

1. Jal Marg Vikas Project (JMVP)

- Focuses on developing **NW-1 (Ganga Waterway)** from Prayagraj to Haldia.
- Financial and technical assistance from the **World Bank**.

2. River Information System (RIS)

- Enhances navigation safety through real-time vessel tracking.

3. Roll-on/Roll-off (Ro-Ro) & Ro-Pax Services

- Facilitate seamless movement of vehicles and passengers.

4. PM Gati Shakti

- Integrates waterways with railways, roads, ports, and airports for multimodal logistics.

Advantages of Inland Water Transport

- Lower transportation cost compared to road and rail.
- Higher fuel efficiency.
- Reduced carbon emissions.
- Suitable for bulk commodities such as coal, cement, food grains, and fertilizers.

Avalanche in Ladakh

Why in News?

- Another avalanche struck the **Drass area of Kargil district** along the Srinagar–Ladakh Highway on **April 25, 2026**, impacting around nine vehicles, including two tankers that skidded off the road
- This follows a major avalanche at **Zoji La Pass on March 26, 2026**, which claimed **7 lives** and left 9 others injured

Why Avalanches are Common in Ladakh

Geographical Factors

- Zoji La is a high-altitude mountain pass connecting Kashmir to Ladakh
- Known for **unpredictable weather and frequent avalanches**, especially during late winter and early spring
- Heavy snowfall combined with **unstable snow layers** increases risk of sudden slides
- Even small changes in temperature or wind conditions can trigger avalanches

High-Risk Areas

- Zoji La Pass (11,575 ft altitude)
- Drass sector (known as second coldest inhabited place on Earth)
- Fariabad Glacier near Mount Kun

Strategic Importance of Srinagar-Leh Highway

- One of the most important routes in the region, serving as vital link between Kashmir and Ladakh
- Frequently affected during winter months, requiring **constant monitoring and snow clearance**
- Blockage affects movement of essential supplies, personnel, and vehicles
- Authorities have advised travellers to avoid route until conditions stabilise

Kaleshwaram Lift Irrigation Project

Why in News?

- The Telangana High Court barred action against K. Chandrashekar Rao over the Justice PC Ghose Commission report citing procedural lapses, though it upheld the panel's formation.

What is the Kaleshwaram Project?

Overview

- The Kaleshwaram Lift Irrigation Project—the world's largest multi-stage lift irrigation scheme—was conceived by K. Chandrashekar Rao, began in 2016, inaugurated in 2019, and cost about ₹94,000 crore.

Key Components

- **Three barrages:** Medigadda, Annaram, and Sundilla (on Godavari river), **15 reservoirs, 19 substations, 21 pump houses, 203 km of tunnels, Over 1,500 km of canals,** Storage capacity: **141 TMC ft**

Geographical Context

- Located in Jayashankar Bhupalapally district of Telangana, the project draws water from the Godavari River to provide irrigation and drinking water across multiple districts.

Significance for Telangana

Irrigation Impact

- Transformed Telangana into the **leading paddy-producing state** in India, surpassing Punjab and Haryana
- Provides irrigation support even during drought years
- **"permanent solution"** to Telangana's decades-long struggle for drinking and irrigation water

Scale

- claim it is the **largest irrigation project in India's history**
- Each component is critical to ensuring irrigation support across Telangana

Marine Spatial Plan

Why in News?

- Odisha has become the **first state in India** to launch a **Marine Spatial Plan (MSP)** under the second phase of the India-Norway sustainable ocean management initiative
- The state government signed an **MoU with the National Centre for Coastal Research (NCCR)** under the Ministry of Earth Sciences for implementation
- First phase (2021-2022) was implemented in **Puducherry and Lakshadweep**

What is Marine Spatial Planning (MSP)?

Definition (UNESCO-IOC)

- A **public process** of analyzing and allocating the spatial and temporal distribution of human activities in marine areas to achieve **ecological, economic, and social objectives** specified through a political process

Key Features

- **Data-driven planning tool** that maps marine areas and allocates zones for activities such as fishing, tourism, shipping, conservation, and energy projects
- Balances **economic growth with environmental protection**
- Promotes **sustainable use of marine resources**

- Supports development of **Blue Economy**

Why Odisha Needs MSP

- **Rich but sensitive coast:** ~574 km coastline with lagoons, mangroves, and estuaries supporting high biodiversity.
- **Rising development pressure:** Industry, tourism, and ports increasing resource conflicts—needs balanced growth.
- **High climate risk:** Frequent cyclones and sea-level rise demand adaptive coastal planning.

Implementation Details

- **Scientific mapping (NCCR):** Study coastal waters off Odisha—benthic mapping, salinity, temperature—and identify zones for tourism, fisheries, and seaweed/seagrass cultivation.
- **Policy & governance:** Data-driven policymaking to support multi-sector coastal development and stakeholders.

India-Norway Collaboration

- India–Norway **Integrated Ocean Initiative (2019)**: pilot phase (2021–22) in Puducherry & Lakshadweep with ~₹8–10 crore/year funding.
- Expansion phase (2026): Odisha as first full-scale state; backed by MoES with support interest from World Bank & UNEP.

Strategic Significance

Blue Economy Alignment

- Aligns with Centre's emphasis on **Blue Economy as one of ten core dimensions of growth** (New India by 2030 vision)
- Supports sustainable ocean resources utilisation for economic and social development

Hanging Glaciers in Central Himalaya

Why in News?

- Study in **Nature Partner Journals (npj) Natural Hazards** (IISc + IIT Bhubaneswar + DRDO) identified **219 hanging glaciers** in **Alaknanda basin, Uttarakhand**
- Nearly **one-third** are highly **"unstable"** – prone to sudden break-offs

What are Hanging Glaciers?

- Glaciers clinging to **steep valley walls** – terminate abruptly
- Can trigger **ice avalanches** → river damming → **GLOF** (cascading disaster)
- **2021 Chamoli disaster** demonstrated this mechanism

Key Findings

Parameter	Figure
Hanging glaciers identified	219
Area covered	~72 sq km
Ice volume	2.39 cubic km
Unstable glaciers	~33%

Human Exposure (Badrinath-Mana stretch)

- **Built-up area:** 8,000 sqm (2000) → 150,000 sqm (2030) – 19x increase
- **Population at risk:** <400 (2000) → 8,500+ (2030) – 21x increase

Infrastructure at risk

- **National Highway 7** – pilgrimage route to Badrinath
- Hydropower projects, towns, trekking routes

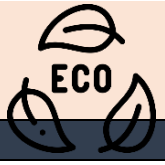
Why This is Happening

- Himalayan warming **exceeds global average**
- Accelerated glacier retreat → tributary glaciers detaching from trunk glaciers
- Previously stable glaciers now destabilised

Comparison with Global Practices

- **Alps:** monitored with radar, cameras, early warning systems
- **Himalayas:** no large-scale monitoring
- **Recommendation:** targeted monitoring in high-risk locations

ENVIRONMENT AND ECOLOGY



Rice's Whale: Oil Drilling vs. Endangered Species

News Context:

The **Trump administration** has invoked national security (citing the Iran war and rising energy prices) to seek an exemption from endangered species laws to expand **oil and gas drilling** in the Gulf of Mexico. The seldom-used **Endangered Species Committee** granted this request on **March 31, 2026**, despite scientific warnings that drilling could push the critically endangered **Rice's whale**—of which fewer than **100 remain**—to extinction.

Key Details & Important Facts:

- **Species Name: Rice's Whale** (*Balaenoptera ricei*)
- **Status:** Endangered (recognized as a distinct species only in **2021**)
- **Habitat:** Year-round resident of the **Gulf of Mexico**; found primarily in a narrow area in the **northeastern part** of the gulf.
- **Population: Fewer than 100 individuals** remaining.
- **Threats from Drilling:** Vessel strikes, noise pollution, oil spills, climate change, disruption of foraging (feeds on silver-rag driftfish), and prey habitat shifts.
- **Historical Impact:** A significant portion of the population was likely killed by the **2010 Deepwater Horizon oil spill**.
- **Other Species at Risk:** Kemp's Ridley turtle (endangered), loggerhead turtle, manatees (threatened), whooping cranes, sperm whales, endangered corals.
- **Legal Mechanism: Endangered Species Committee** (nicknamed the "God Squad") granted exemption from the **Endangered Species Act (ESA)** —only the **third exemption** ever issued (previous: Platte River dam; northern spotted owl logging – withdrawn).

Light Pollution Threatens World's Darkest Skies in Chile's Atacama Desert

Why in News?

- Chile's **Atacama Desert** – considered the driest place on Earth – faces growing threat from **light pollution** due to urban sprawl, industrial development, mining, and wind farms

- An energy firm's proposal to build a **green power complex** just kilometres from the **Paranal Observatory** (later cancelled) exposed that existing sky preservation laws are **outdated and unclear**

Atacama Desert: An Astronomical Paradise

Unique Conditions

- **Driest non-polar desert** in the world
- Over **300 clear nights per year** (no clouds, no rain)
- High altitude (3,000+ metres)
- Isolation from urban light pollution
- Area: over **105,000 sq km**

Why It's Ideal for Astronomy

- Rare combination of dry climate, high altitude, and darkness makes it an unrivalled hub for world-class astronomy
- Home to the **world's largest ground-based astronomical projects**

Major Observatories and Telescopes

European Southern Observatory (ESO)

- Operates several facilities in Atacama, including **Paranal Observatory**

Extremely Large Telescope (ELT)

- $1.5 billion endeavour by ESO
- Scheduled for completion in **2030**
- **798 mirrors** with light-gathering area of nearly **1,000 square metres**
- Will be **20 times more powerful** than today's leading telescopes
- Will be **15 times sharper** than NASA's **Hubble Space Telescope**

Other Observatories

- Atacama Large Millimeter/submillimeter Array (ALMA)
- Several international projects in the "Photon Valley" corridor

The Threat: Light Pollution

What is Light Pollution?

- Excessive, misdirected, or obtrusive artificial light
- Disrupts astronomical observations by creating "skyglow" that washes out faint celestial objects

Sources of Threat in Atacama

- Urban sprawl (growing cities near observatories)
- Industrial development
- Mining operations
- Wind farms (proposed green power complex near Paranal)

Kraken Fossils

Why in News?

A recent study published in *Science* has identified fossilized jaw (beak) remains of giant octopus-like creatures, popularly dubbed **"Krakens"**, suggesting that enormous cephalopods were among the apex predators of the **Late Cretaceous oceans**. The discovery challenges the long-held belief that only marine reptiles and sharks occupied the top of the marine food chain.

What are Kraken Fossils?

- Researchers analyzed **27 fossilized jaws (beaks)** discovered in **Japan** and **Vancouver Island (Canada)**.
- The fossils belong to giant finned octopuses of the genus **Nanaimoteuthis**.
- Two species identified:
  - **Nanaimoteuthis jeletzkyi**
  - **Nanaimoteuthis haggarti**

Key Findings

1. Largest Invertebrate Predators

- *N. haggarti* may have reached **18.6–19 metres** in length, larger than modern giant squids.

- Possibly among the largest invertebrates ever discovered.

2. Apex Predators

- Wear patterns on fossil beaks indicate feeding on **hard-shelled and bony prey**.
- Likely competed with marine reptiles such as **mosasaurs** and large sharks.

3. Evolutionary Significance

- Demonstrates that **soft-bodied invertebrates** could also evolve into top predators.
- Suggests convergent evolution of predatory traits among vertebrates and cephalopods.

SAF-Blended Aviation Fuel

Why in News?

The Government of India has amended the **Aviation Turbine Fuel (ATF) (Regulation of Marketing) Order, 2001**, bringing **ATF blended with Sustainable Aviation Fuel (SAF)** under its regulatory ambit. The amendment aims to facilitate the adoption of cleaner aviation fuels and align India with global aviation decarbonization efforts.

What is Sustainable Aviation Fuel (SAF)?

- SAF is a **renewable aviation fuel** produced from alternative feedstocks such as:
  - Agricultural residues
  - Biomass
  - Used cooking oil
  - Municipal waste
  - Biogenic residues
- It consists of aviation-grade hydrocarbons that are **chemically similar to conventional ATF** and can be used in existing aircraft engines without modifications.

Key Features of the Amendment

1. Expansion of ATF Definition

- ATF now includes:
  - Co-processed SAF
  - SAF blended with conventional ATF
  - Synthetic hydrocarbons derived from non-petroleum sources.

2. Regulatory Clarity

- SAF-blended fuel will now be governed under the existing ATF marketing framework.
- Facilitates production, storage, distribution, and marketing of SAF blends.

3. Quality Standards

- SAF must comply with stringent standards recognized by:
  - **International Civil Aviation Organization (ICAO)**
  - **ASTM International**
  - **Bureau of Indian Standards (BIS)** specifications (IS 1571 and IS 17081).

Link with CORSIA

- **CORSIA (Carbon Offsetting and Reduction Scheme for International Aviation)** is an ICAO-led mechanism to reduce emissions from international aviation.
- Its mandatory phase begins in **2027**.
- Use of SAF helps airlines reduce carbon-offset obligations.

Arsenic and Fluoride Contamination in Groundwater

Why in News?

The **National Green Tribunal (NGT)** recently expressed concern over the continued contamination of groundwater by **arsenic and fluoride** in several Indian states, particularly **Bihar, Uttar Pradesh, West Bengal, Assam, Punjab, Rajasthan, Gujarat, Karnataka, and Telangana**. The Tribunal sought effective implementation of mitigation measures to ensure safe drinking water.

What is Arsenic Contamination?

- Arsenic is a naturally occurring toxic metalloid found in rocks and sediments.
- It enters groundwater through **geogenic processes** (natural leaching from arsenic-rich sediments).
- Long-term consumption causes **Arsenicosis**.

Health Effects

- Skin lesions and pigmentation.
- Peripheral neuropathy.
- Cardiovascular diseases.
- Increased risk of cancers (skin, lung, bladder, liver).

Major Affected States

- West Bengal, Bihar, Uttar Pradesh, Assam, Jharkhand

What is Fluoride Contamination?

- Fluoride occurs naturally in groundwater due to weathering of fluoride-bearing minerals such as fluorite and apatite.
- While small amounts are beneficial for dental health, excessive fluoride is harmful.

Health Effects

- **Dental Fluorosis** – mottling and discoloration of teeth.
- **Skeletal Fluorosis** – joint stiffness, bone deformities, and disability.

Major Affected States

- Rajasthan, Gujarat, Telangana, Karnataka, Andhra Pradesh

Government Initiatives

1. Jal Jeevan Mission (JJM)

- Provides Functional Household Tap Connections (FHTCs) with safe drinking water.

2. National Water Quality Sub-Mission (NWQSM)

- Focuses on arsenic and fluoride-affected rural habitations.

3. Atal Bhujal Yojana

- Promotes sustainable groundwater management.

4. Central Ground Water Board (CGWB)

- Monitors groundwater quality and contamination levels.

WHO & BIS Standards

Parameter	WHO Guideline	BIS Acceptable Limit
Arsenic	0.01 mg/L	0.01 mg/L
Fluoride	1.5 mg/L	1.0 mg/L (acceptable), 1.5 mg/L (permissible)

Shekha Jheel Bird Sanctuary: India's 99th Ramsar Site

Why in News?

- **Shekha Jheel Bird Sanctuary** in **Aligarh, Uttar Pradesh** designated as a **Ramsar site** on **April 22, 2026**
- India's total Ramsar sites: **99** (one short of 100)
- Uttar Pradesh's tally: **12** Ramsar sites

About Shekha Jheel Bird Sanctuary

- **Location:** Aligarh district, Uttar Pradesh; part of the Upper Ganga Plain.
- **Ecological Role:** Important stopover on the Central Asian Flyway; key winter habitat for migratory birds.
- **Key Species:** Bar-headed Goose, Painted Stork (near-threatened), and various ducks.

Ramsar Convention Context

What is Ramsar Convention?

- International treaty for **conservation and wise use of wetlands**
- Signed in **1971** in **Ramsar, Iran**
- Also known as **Convention on Wetlands**
- India became a signatory in **1982**

India's Ramsar Sites – Key Statistics

Current Status (as of April 22, 2026)

- Total Ramsar sites: **99**
- Total wetland area covered: approximately **1.33 million hectares**

Central Asian Flyway (CAF)

Definition

- One of the world's **nine major migratory bird flyways**
- Stretches from **Siberia (Russia) to the Indian Ocean** (including Indian subcontinent)
- Shekha Jheel is a **critical stopover** on this route

Significance for India

- India hosts millions of migratory birds annually along this flyway
- Wetlands like Shekha Jheel provide **feeding, resting, and breeding grounds**
- Conservation of such sites is crucial for **global biodiversity**

Global Water Initiative – 'Water Forward' (World Bank)

Why in News?

- In April 2026, the **World Bank** launched the **'Water Forward'** programme to tackle global water stress.
- The initiative aims to build climate-resilient water systems and ensure sustainable water security, especially in developing and vulnerable economies.

What is 'Water Forward'?

Definition

- A **global financing and technical assistance programme** by the World Bank.
- Focuses on **integrated water resource management** (IWRM) to address growing water scarcity, climate variability, and deteriorating water infrastructure.

Core Objectives

- Enhance **water security** for drinking, agriculture, and industry.
- Promote **climate-resilient water infrastructure** (e.g., desalination, wastewater recycling, aquifer recharge).
- Support **policy and institutional reforms** for water governance.
- Mobilize **public and private finance** for water projects.

India's Context and Relevance

India's Water Stress

- India is one of the most water-stressed countries globally (per the World Bank and NITI Aayog).
- Groundwater depletion, river pollution, and uneven monsoon patterns (exacerbated by climate change) threaten agriculture, industry, and domestic supply.

Alignment with National Schemes

- **Jal Jeevan Mission (JJM)** : Har Ghar Jal (tap water for every rural household).
- **National Rural Drinking Water Mission** and **Atal Bhujal Yojana** (groundwater management).
- **Namami Gange Programme** (river rejuvenation).

Potential Support from 'Water Forward'

- Technical assistance for **water recycling** and **desalination plants** (especially in coastal cities like Chennai, Mumbai).
- Financing for **climate-resilient urban water systems** (flood control, stormwater management).
- Knowledge sharing on **water pricing** and **demand-side management**.

Black Panther

Why in News?

- A female **black panther** was released into an enclosure at **Indira Gandhi Zoological Park (IGZP), Visakhapatnam** on **April 21, 2026**

- Ends a **40-year gap** since the species was last on display at the zoo (mid-1980s)

About the Black Panther

What is a Black Panther?

- A **melanistic variant** of the **leopard** (not a separate species)
- Dark coat caused by an **excess of the pigment melanin**
- Found predominantly in **dense forests of South and Southeast Asia**

Characteristics

- **Solitary** and **nocturnal** habits
- Plays a key role in **maintaining ecological balance** (apex predator)

Source and Exchange Programme

Origin

- Brought from **Assam State Zoo-cum-Botanical Garden, Guwahati**
- Assam Zoo is the **only breeding centre for black panthers in India**

Earth Day 2026: Our Power, Our Planet

Why in News?

- **Earth Day 2026** (April 22) theme: **"Our Power, Our Planet"** – emphasizing individual and community action over policy alone
- **Down To Earth** magazine pays tribute to people-led environmental movements from the iconic Chipko Movement to ongoing protests in Odisha and the Ken-Betwa region

Chipko Movement (1970s): The Original "Tree Huggers"

- **Origin & method:** 1970s Himalayas (Uttarakhand); “Chipko” = hugging trees to stop felling; 1974 Reni action led by Gaura Devi led to a 20-year ban above 1,000 m.
- **Key leaders:** Sunderlal Bahuguna, Chandi Prasad Bhatt, and Gaura Devi.
- **Spread:** Reached Gujarat (Chhota Udaipur) where tribal women protected Mahua trees under Harivallabh Parikh and Sanat Mehta.
- **Impact & message:** Influenced forest conservation laws (1980), curbed deforestation, protected livelihoods; highlighted links between deforestation, floods, and landslides.

Ongoing People-Led Movements (2026)

1. Ken-Betwa River Linking Project Protests (Madhya Pradesh)

- **Context:** Protests (April 2026) at Dhodan Dam, part of the Ken–Betwa link in MP; ~1,000 people from 40 villages mobilised.
- **Key demands:** Higher compensation, halt to alleged unauthorised demolitions, and withdrawal of “false cases.”
- **Govt stance:** Says 90% compensation done under rules; prohibitory orders imposed; some protesters booked for trespass/damage.
- **Outcome:** Protest called off after review assurance; joint teams to re-survey 14 villages using official records.

2. Sijimali Bauxite Mine Protests (Odisha)

- **Project & protests:** Since 2023, tribals in Sijimali hills (Rayagada, Odisha) oppose a 50-year bauxite lease to Vedanta Limited; includes a forest road (≈5 ha felling) and a 311 MT mine (9 MT/yr).
- **Police clash (Apr 7, 2026):** Violence at Kantamal village—~70 injured; allegations of night raids, power cuts, lathi-charge/tear gas, detentions, and “false cases.”
- **Rights concerns:** Alleged violations of PESA Act, 1996 and Forest Rights Act, 2006—no valid Gram Sabha consent; disputed 2023 meetings; pending forest rights claims.

- **Political response:** Opposition parties and leaders seek probe, halt to project, and fresh Gram Sabhas under judicial oversight (Niyamgiri-like process).

Shergarh Sanctuary

Why in News?

Anita Chaudhary, a forest guard posted in **Shergarh Sanctuary, Rajasthan**, was recently featured for her exceptional contribution to wildlife conservation. She was awarded the **WWF 'Machchli National Award'**, named after the famous tigress Machchli of Ranthambore, for her efforts in wildlife rescue, anti-poaching operations, and curbing illegal mining and smuggling activities.

Who is Anita Chaudhary?

- Forest Guard in **Shergarh Sanctuary**, located in **Baran district, Rajasthan**.
- Joined the Forest Department in **2016**.
- Since her deployment in Shergarh, she has:
    - Helped rescue around **500 wild animals**, including crocodiles.
    - Filed **50+ FIRs** against poachers and wildlife offenders.
    - Acted against illegal **tendu leaf smuggling**, grazing, encroachment, and stone mining.

About Shergarh Sanctuary

Location

- Situated in **Baran district** of Rajasthan.
- Lies near the border of Madhya Pradesh.
- Covers approximately **99 sq. km (9,880 hectares)**.

Important Fauna

- Leopard, Sloth Bear, Hyena, Wild Boar, Chinkara, Sambar Deer, Crocodile

Conservation Significance

Threats Faced

- Poaching
- Illegal mining
- Tendu leaf smuggling
- Grazing pressure
- Encroachment into forest areas

Conservation Measures

- Anti-poaching patrols.
- Water conservation through small ponds and check dams.
- Night surveillance and community engagement.
- Habitat protection for native wildlife.

SCIENCE & TECHNOLOGY

Quantum Entanglement: From Light Particles to Helium Atoms

News Context:

Scientists from Australia and the U.S. have successfully demonstrated **momentum entanglement** using **helium atoms**—relatively "heavy" particles—by colliding atomic clouds. This achievement expands quantum entanglement beyond lighter particles like electrons and opens new avenues for studying the link between **quantum physics and gravity**, a major unresolved problem in fundamental physics.

Key Details & Important Facts:

- **What is Quantum Entanglement?**
  - A phenomenon where two or more particles become linked such that they share a single quantum state.
  - Measuring a property (e.g., momentum, spin, polarization) of one particle **instantly determines** the corresponding property of the other, regardless of distance.
  - Einstein famously called it **"spooky action at a distance"** .
- **Recent Breakthrough:**
  - **Achievement:** Momentum entanglement achieved using **helium atoms**.
  - **Method:** Colliding clouds of helium atoms to create entangled pairs.
  - **Significance:** Demonstrates that even massive (composite) particles obey quantum rules, previously observed mostly in massless or light particles (e.g., photons, electrons).
- **Key Concept – Momentum Entanglement:**
  - The entangled property is **momentum** (mass × velocity).
  - Before measurement, neither atom has a definite direction; measurement of one instantly defines the other's momentum.
- **Distinction from Teleportation:**
  - Entanglement involves **quantum information transfer**, not physical matter teleportation.

GLP-1 Drugs: Mechanism, Risks, and India's Regulatory Response

News Context:

The **Drug Controller General of India (DCGI)** has intensified regulatory surveillance on **GLP-1 receptor agonists** (used for type 2 diabetes and obesity) due to concerns over unauthorised sale, unsupervised use, and misleading advertisements. This follows the drugs' growing popularity and availability through retail pharmacies, online platforms, and wellness clinics without proper medical oversight.

Key Details & Important Facts:

- **What are GLP-1 Drugs?** Glucagon-like peptide-1 receptor agonists. They mimic the natural GLP-1 hormone to:
  - **Stimulate insulin** release (lowers blood sugar)
  - **Suppress glucagon** (prevents liver from releasing excess glucose)
  - **Slow gastric emptying** (induces satiety, leading to weight loss)
- **Uses:** Type 2 Diabetes Mellitus and Obesity management.
- **Examples:** Semaglutide (injection & tablets), Liraglutide, Tirzepatide, Dulaglutide, Exenatide.
- **Risks:** Side effects range from nausea to severe complications like **pancreatitis, medullary thyroid cancer, kidney injury, and bowel obstruction**.
- **Regulatory Actions (March 2026):**
  - Advisory against misleading advertisements.
  - **49 businesses** (online pharmacies, wholesalers, clinics) audited nationwide.
  - Prescription restricted to **endocrinologists, internal medicine specialists, and cardiologists**.
  - Penalties include license cancellation, fines, and legal action.

Qdenga (TAK-003): India's First Dengue Vaccine

News Context:
India's drug regulator (DCGI) has granted clearance to **Takeda's tetravalent dengue vaccine TAK-003 (brand name Qdenga)** for use in individuals aged **4 to 60 years**.
This marks a significant shift from reactive **vector control measures** (insecticide use, breeding site elimination) to a **preventive approach** against dengue—a disease endemic to India with a long-term rising trend.
Key Details & Important Facts:

- **Vaccine Name:** Qdenga (TAK-003)
- **Developer:** Takeda (Japan-based)
- **Type: Tetravalent** live-attenuated vaccine (targets all 4 dengue serotypes: DENV-1 to DENV-4)
- **Platform:** Developed on **DENV-2 backbone**
- **Regulatory Status in India:** Cleared by **Subject Expert Committee (SEC)** under DCGI
- **Age Group:** 4 to 60 years
- **Dosage Regimen: Two doses**, 3 months apart
- **Key Advantage: No pre-vaccination screening** required (unlike earlier vaccine – Sanofi's Dengvaxia)
- **Proven Efficacy:** Strong protection against **severe dengue & hospitalization**
- **Limitation:** Lower efficacy against **DENV-3 and DENV-4** (especially in seronegative individuals)
- **Expected Cost in India:** ₹3,000–6,000 per dose; full course ₹6,000–12,000 (private sector initially)
- **Indian Pipeline Candidate: DengiAll** (Panacea Biotec + ICMR) – single-dose, based on **NIH's TV003 platform**; Phase III trials ongoing; expected availability ~2027

Childhood Cancer

News Context:
The **Global Burden of Disease (GBD) 2023 study**, published in *The Lancet*, reveals stark inequalities in childhood cancer outcomes. While mortality has declined globally, **94% of childhood cancer deaths** in 2023 occurred in **low- and middle-income countries (LMICs)**.
In India, childhood cancer is the **tenth leading cause of child deaths** (17,000 deaths in 2023), yet it remains **excluded from India's national cancer control planning**.
Key Details & Important Facts:

- **Global Burden (2023):**
  - New cases: **3.77 lakh**
  - Deaths: **1.44 lakh**
  - Childhood cancer is the **8th leading cause** of child deaths globally (ahead of measles, TB, HIV/AIDS).
- **Disparity (LMICs vs. HICs):**
  - **85%** of new cases
  - **94%** of deaths
  - **94%** of Disability-Adjusted Life Years (DALYs)
- **India-Specific Data:**
  - **10th leading cause** of death among children
  - **17,000 deaths** in 2023
  - **South Asia** accounts for **20.5%** (1 in 5) of global child cancer deaths.
  - **16.9% increase** in childhood cancer deaths in India from 1990 to 2023.
- **India's Policy Gap:** National cancer control planning currently screens only for **oral, cervical, and breast cancers** – childhood cancer is **not included**.
- **DALY Definition:** Total years of healthy life lost = years lost to premature death + years lived with disability.

Hectocotylus

Current Context

A groundbreaking study published in the journal **Science** (April 2, 2026) has revealed that the hectocotylus is not merely a sperm-delivery organ but a **sophisticated sensory tool** that can "taste" female hormones.

The Discovery

Researchers discovered that the hectocotylus is equipped with **chemotactile receptors** that detect **progesterone**—a hormone produced by the female octopus's reproductive tract and skin.

Key Findings

- The hectocotylus contains **up to three times more chemotactile receptors and neurons** than normal arms
- A specialized receptor called **CRT1** evolved from ancestral neurotransmitter receptors to specifically recognize progesterone with high affinity
- When the hectocotylus detects progesterone, it triggers the male to locate the oviduct and release sperm
- This ability works even in **complete darkness**

Why This Matters (Evolutionary Significance)

- The discovery explains how solitary octopuses—which rarely encounter mates and are prone to aggression—can reproduce efficiently without direct visual contact.
- The hectocotylus merges **sensory assessment and gamete delivery** into a single appendage, allowing males to fertilize females "at arm's length" while avoiding potentially lethal attacks.

3D Glass Chip Packaging Plant

Why in News?

- Foundation stone laid for India's first **advanced 3D chip packaging unit** in **Bhubaneswar, Odisha**
- Project led by **US-based 3D Glass Solutions** with investments from **Intel, Lockheed Martin**, and other VC/PE funds

Project Overview

- **Project & Investment:** Semiconductor unit in Bhubaneswar under ISM with ₹1,934 crore outlay.
- **Capacity:** 70,000 glass panels, 50 million units, and 13,000 3DHI modules annually.
- **Employment:** ~2,500 jobs (direct & indirect).

What are 3D Glass Semiconductors?

Key Features

- Uses **glass-based substrates** instead of traditional silicon wafers
- **3D stacking technology** – vertical integration of multiple chip components
- Dramatically increases computing power within the same physical footprint

Advantages of Glass Substrates

- Better **thermal stability**
- Lower **signal loss**
- Higher **precision** for advanced nodes

Applications

- Artificial Intelligence (AI)
- 5G telecommunications
- Defence electronics
- Data centres

Why is This Important? (Moore's Law Context)

Moore's Law (1965, Gordon Moore – Intel co-founder)

- Number of transistors on a chip doubles approximately every two years
- Drives exponential gains in computing power while reducing costs

The Problem

- Chips approaching **physical and thermal limits** at advanced nodes

- Pace of improvement has slowed

The Solution

- **Advanced packaging, chiplets, and 3D integration** – alternative pathways to sustain performance improvements
- "Heterogeneous integration" – stacking logic, memory, and sensors vertically

India Semiconductor Mission (ISM) – 1.0 and 2.0

- **ISM 1.0 (2021):** ₹76,000 crore to build full chip ecosystem; 10 projects across 6 states with ₹1.6 lakh crore investments (fab, ATMP, design, packaging).
- **ISM 2.0 (Proposed):** ~$11 billion focus on supply chain support, stronger design push, and market-linked incentives.

Artemis II: Historic Lunar Flyby Breaks Distance Record

Why in News?

On **April 6, 2026**, NASA's **Artemis II** crew became the **humans to travel furthest from Earth**, breaking the 54-year-old record set by **Apollo 13 (1970)** . The four astronauts are currently journeying around the Moon for a monumental flyby.

Key Records Broken

- **Maximum distance from Earth: 252,760 miles (406,778 km)** – approximately **4,105 miles (6,606 km)** beyond Apollo 13's record
- The crew will spend **over six hours** analysing and documenting lunar surface features, including areas **never before seen by the naked eye**

Key Technical Details

- **Spacecraft:** Orion capsule
- **Trajectory:** "Free-return trajectory" – zipping around the Moon before U-turning back to Earth (return trip ~4 days)
- **Communication blackout:** ~40 minutes when passing behind the Moon
- **Upcoming event:** Astronauts will witness a **solar eclipse** (Sun behind the Moon) near the end of their flyby

Scientific Significance

- **Human eye vs. camera:** NASA emphasises that the human eye remains superior to any camera for lunar observation ("the number of receptors in the human eye far outweighs what a camera is able to do")
- The flyby is key to preparing for future crewed lunar landing missions:
  - **Artemis III (2027)** – crewed lunar landing
  - **Artemis IV (2028)** – lunar landing mission

Message from the Late Jim Lovell

The late Apollo 8 & 13 astronaut recorded a message shortly before his death: *"Welcome to my old neighbourhood. I'm proud to pass that torch on to you as you swing around the Moon."*

Project Hail Mary & The Science of 40 Eridani

News Context:

The film *Project Hail Mary* (based on Andy Weir's novel) has sparked public interest in the science of exoplanets. The movie features an alien named "Rocky" from the star system **40 Eridani A** (the same system famously associated with **Spock's home planet Vulcan** in *Star Trek*). The article explains the astrophysical feasibility of such a planet.

What is a Habitable Zone (Goldilocks Zone)?

- **Definition:** The region around a star where temperatures are just right for **liquid water** to exist on a planet's surface.
- **Importance:** Liquid water is considered essential for life *as we know it*.
- **For 40 Eridani A:** The habitable zone is located **101.7 million km** from the star.

How Could Life Survive? (The "Venus" Solution)

For a planet so close to its star to support life, the author hypothesised:

1. **High Atmospheric Pressure:** Like Venus, a thick atmosphere traps heat but also allows liquids to exist at higher temperatures.
2. **Strong Magnetic Field:** Protects the atmosphere from being blown away by stellar winds.
3. **Ammonia Atmosphere:** Instead of nitrogen/oxygen, Weir imagined an atmosphere of ammonia to suit the hot environment.
4. **Temperature:** Approx. **210° Celsius**.

Space-Based Solar Power (SBSP)

Why in News?

Recent discussions on **Space-Based Solar Power (SBSP)** have gained attention due to proposals such as the **"Lunar Ring" concept**, which envisions deploying solar power infrastructure on the Moon to transmit clean energy to Earth. However, questions remain regarding its economic feasibility compared to rapidly declining costs of terrestrial solar energy.

What is Space-Based Solar Power (SBSP)?

- SBSP involves collecting solar energy in space using satellites or lunar-based solar arrays and transmitting it to Earth.
- Energy is converted into **microwaves or laser beams** and beamed to receiving stations (**rectennas**) on Earth.
- Since space lacks atmospheric interference and experiences near-continuous sunlight, energy generation is potentially higher than ground-based systems.

Lunar Ring Proposal

- Proposed by Japanese researchers under the **Luna Ring concept**.
- Envisions a solar-panel belt around the Moon's equator.
- Electricity generated on the Moon would be transmitted to Earth through microwave transmission systems.
- Aims to provide continuous renewable energy independent of weather conditions.

Advantages of SBSP

- Near-continuous solar energy availability.
- No atmospheric absorption or cloud cover.
- Potential for large-scale clean energy generation.
- Reduced dependence on fossil fuels.

Challenges

- Extremely high launch, construction, and maintenance costs.
- Complex wireless power transmission technology.
- Space debris and radiation risks.
- Significant energy losses during transmission.
- Terrestrial solar and battery technologies are currently far cheaper.

CDKN1B Gene Discovery

Why in News?

Researchers from the **University of Delhi South Campus** and **Tata Memorial Centre, Mumbai**, have identified the **CDKN1B gene** as a key factor behind resistance to hormone therapy in breast cancer patients. The findings could help predict treatment failure and enable more personalized cancer therapies.

What is CDKN1B?

- **CDKN1B** is a tumor-suppressor gene.
- It produces the **p27 protein**, which regulates the cell cycle and prevents uncontrolled cell division.
- The p27 protein acts as a natural brake on cancer cell proliferation.

Key Findings of the Study

1. Cause of Drug Resistance

- Researchers analyzed **186 breast cancer samples** (therapy-sensitive and therapy-resistant).

- Loss, mutation, or reduced activity of the **CDKN1B gene** was found predominantly in therapy-resistant tumors.
- Deficiency of p27 allows cancer cells to evade hormone-based treatments such as tamoxifen.

2. Restoration Reverses Resistance

- When p27 levels were restored in laboratory models, resistant cancer cells became sensitive to treatment again.
- Tumor growth was significantly reduced.

3. New Treatment Strategy

- CDKN1B-deficient tumors remained responsive to **CDK4/6 inhibitors** such as **Palbociclib**.
- Combination therapy (hormonal drugs + CDK4/6 inhibitors) showed improved outcomes.

Why is this Important?

- **Hormone Receptor-Positive (HR+) / HER2-negative breast cancer** accounts for nearly **70% of breast cancer cases**.
- Around **40% of patients** eventually develop resistance to endocrine (hormonal) therapy.
- Measuring **p27 levels** could serve as a **biomarker** to identify high-risk patients before treatment begins.

HISTORY AND ART & CULTURE

Samrat Samprati: The Jain Counterpart to Ashoka

News Context:

On **Mahavir Jayanti (March 31, 2026)**, Prime Minister Narendra Modi inaugurated the **Samrat Samprati Museum** in **Koba, Gandhinagar (Gujarat)**.

The museum is dedicated to Jain history and the life of **Samrat Samprati**, the grandson of the Mauryan ruler Ashoka. While Ashoka is renowned for spreading **Buddhism**, Samprati is remembered for his deep association with and propagation of **Jainism** across the subcontinent and beyond.

Key Details & Important Facts:

- **Samrat Samprati:** Grandson of **Ashoka** (son of Kunala); believed to have reigned **c. 230–220 BCE**
- **Succession:** After Ashoka's death (232 BCE), empire divided between his grandsons – **Dasharatha** (east) and **Samprati** (west)
- **Religious Affiliation: Shvetambara Jain** tradition considers Samprati the central Mauryan figure (while Digambaras venerate Chandragupta Maurya)
- **Conversion:** Converted under monk **Suhastin** (8th leader of Jain congregation established by Mahavira) in **Ujjain**
- **Key Contributions (as per Jain texts):**
  - Facilitated movement of monks to distant regions
  - Built **125,000 new temples**; renovated **36,000 old ones**
  - Consecrated **12.5 million stone icons** and **95,000 metal icons**
  - Established **700 charitable centers** for the poor
- **Regions of Jain Propagation:**
  - **Within India:** Andhra, Tamil Nadu, Karnataka, Maharashtra, Saurashtra, Gujarat, Malva, Rajputana
  - **Beyond India:** China, Burma (Myanmar), Afghanistan, Nepal, Bhutan; some accounts claim Central Asia, Arabian peninsula, West Asia
- **Historical Comparison:** Samprati is to Jainism what Ashoka is to Buddhism – spread teachings, built temples/icons, and established ritual culture

Prakash Purab of Guru Tegh Bahadur

News Context:

On April 7, 2026, leaders including Narendra Modi and Amit Shah paid tributes to Guru Tegh Bahadur on his Prakash Purab, honouring his courage and sacrifice, following his 350th martyrdom commemoration in 2025.

Who Was Guru Tegh Bahadur (1621–1675)?

Guru Tegh Bahadur was the **ninth of the ten Sikh Gurus**. He was born on **April 1, 1621** (or April 21, 1621 as per other sources) in Amritsar to Mata Nanki and **Guru Hargobind** (the sixth Sikh Guru, who raised an army against the Mughals and introduced the concept of warrior saints) . Originally named **Tyag Mal** due to his ascetic nature, he distinguished himself in battle at the age of just 13 .

His term as Guru ran from 1665 to 1675. He was an excellent warrior, thinker, and poet. **115 or 116 of his hymns** are incorporated into the **Guru Granth Sahib**, the holy scripture of Sikhism . He was also an avid traveler and founded the town of **Chak-Nanki** in Punjab, which later became part of **Anandpur Sahib** .

The Supreme Sacrifice: Martyrdom in 1675

The Trigger:

- Kashmiri Pandits, facing religious persecution and forced conversion by Mughal Emperor **Aurangzeb**, approached Guru Tegh Bahadur for help .
- The Guru stood up for their right to religious freedom, refusing to convert to Islam.

The Execution:

- In **1675**, Guru Tegh Bahadur was **publicly executed** (beheaded) on the orders of Aurangzeb in **Chandni Chowk, Delhi** .
- He earned the title **"Hind di Chadar"** (literally "Shield of India" or "Protector of Hind") for defending religious freedom and opposing forced conversions .
- **Gurdwara Sis Ganj Sahib** (Chandni Chowk) marks the site of his execution, and **Gurdwara Rakab Ganj Sahib** marks the site of his cremation .

Impact of His Martyrdom (Historical Significance)

- The execution hardened the resolve of Sikhs against religious oppression and persecution .
- His martyrdom helped consolidate the Sikh Panths, making the protection of human rights central to Sikh identity.
- Inspired by his sacrifice, his **nine-year-old son, Guru Gobind Singh Ji** (the tenth and last Sikh Guru), eventually organized the Sikh community into the **Khalsa** (a distinct, formal, martial community) in 1699 .
- In the words of Noel King of the University of California, **"Guru Tegh Bahadur's martyrdom was the first-ever martyrdom for human rights in the world"** .

St Francis Xavier

Why in News?

- YouTuber **Gautam Khattar** was arrested from Himachal Pradesh. He made **derogatory remarks** against **St Francis Xavier** on April 18, 2026 at an event organised by **Sanatan Dharma Raksha Samiti Mormugao** in Vasco, South Goa
- Remarks led to **widespread protests** across Goa, with protestors demanding immediate arrest for hurting religious sentiments and disturbing communal harmony

Who is St Francis Xavier?

Basic Profile

- Spanish **Jesuit missionary** (1506-1552)
- Founding member of **The Society of Jesus (Jesuits)**
- Revered as **"Goencho Saib"** (Lord of Goa) – patron saint of Goa
- Arrived in Goa in **1542** (Portuguese colony at the time)

"Incorruptible" Remains

- Died in **1552** on Shangchuan Island (off China's coast)
- Body exhumed in **1553**; transported to Malacca (present-day Malaysia)
- Shipped to Goa in **1554**; kept at St Paul's College, Old Goa
- Transferred to **Basilica of Bom Jesus** in **1624**
- Remains found "well preserved" – minimal signs of decay despite being exhumed; considered a **"miracle"** by the faithful

Exposition of Sacred Relics

- Held **once every decade** in Goa
- Four-century-old silver glass casket holding relics is lowered from mausoleum and placed at **Se Cathedral**
- Remains kept for public veneration for **45 days**
- Pilgrims of all faiths, especially Catholics, visit to pay homage

The Controversy

What Happened

- Khattar spoke at **'Bhagwan Parshuram Janmotsav'** event in Vasco, South Goa
- Made derogatory remarks against St Francis Xavier
- Speech went viral on social media, triggering criticism

Bnei Menashe Tribe: 'Operation Wings of Dawn'

Why in News?

- Israel airlifted around **240 individuals from Mizoram** to Tel Aviv on **April 23, 2026**, as part of **'Operation Wings of Dawn'**

- This is the **first time** such a large number of Bnei Menashe members have been airlifted against the backdrop of the ongoing **West Asia war** (Iran-Israel-US conflict)

Who are the Bnei Menashe?

Definition

- A community from **Northeast India** (primarily **Mizoram** and **Manipur**) claiming descent from one of the **Ten Lost Tribes of Israel** – specifically the tribe of **Menashe (Manasseh)**
- Their name means **"Sons of Manasseh"** in Hebrew

Religious and Cultural Identity

- They claim lineage from the tribe exiled by Assyrian conquerors more than **2,700 years ago**
- The community has **adopted Judaism** and follows Jewish religious practices
- Their claim is recognized by **Israel's Chief Rabbinate**, which has accepted them as descendants of the lost tribe

Population in India

- Estimated around **10,000-12,000 people** (including Mizoram and Manipur)
- Several thousand have already **emigrated to Israel** in previous decades

Migration to Israel: Legal Framework

- **Law of Return**: Grants every Jew the right to settle in Israel; Bnei Menashe qualify after recognition by Israel's Chief Rabbinate
- **Conversion Requirement**: Mandatory process involving study of Jewish laws, rituals, and traditions before immigration approval
- **First Aliyah (2005)**: Initial migration of Bnei Menashe to Israel after formal conversion and official recognition

The Ten Lost Tribes of Israel – Biblical Context

- **Historical Split**: After King Solomon (c. 930 BCE), Israel divided; northern kingdom fell to Assyrian Empire (722 BCE), leading to exile of 10 tribes
- **Ten Lost Tribes**: Reuben, Simeon, Levi, Dan, Naphtali, Gad, Asher, Issachar, Zebulun, and Manasseh—later assimilated and termed "lost"
- **Search & Claims**: Many groups claim descent; Bnei Menashe are among the most recognized (linked to Manasseh)
- **Other Claimants**: Beta Israel (Dan), Lemba people (Levi), and Bene Israel (Zebulun)

Thrissur Pooram

Why in News?

- Thrissur Pooram on April 26, 2026 was scaled down after the Mundathikode fireworks tragedy (15 deaths), with no fireworks and a brief Kudamattam, yet crowds still gathered at Thekkinkadu Maidan.

What is Thrissur Pooram?

Overview

- One of the most famous **temple festivals of Kerala**, often called the **"mother of all Poorams"**
- Celebrated at the **Vadakkunnathan Temple** in **Thrissur**
- Known for its majestic display of **caparisoned elephants**, **Kudamattam** (ritual umbrella changing), and **fireworks**

Historical Origin

- Introduced by **Shakthan Thampuran** (Raja of Cochin) in the late 18th century (c. 1798)
- Created as a grand festival to bring together temples from surrounding regions
- Two main competing groups – **Paramekkavu** and **Thiruvambady** – participate in friendly rivalry

Key Rituals and Attractions

- **Kudamattam**: Ceremonial umbrella exchange on elephants; in 2026 limited to 15 minutes with 10 sets
- **Fireworks**: Usually a midnight highlight of Thrissur Pooram; completely cancelled in 2026 after the Mundathikode fireworks tragedy
- **Elephant Procession**: About 30 decorated elephants with nettipattam, bells, and ornaments
- **Ilanjithara Melam**: Traditional percussion performance with chenda, maddalam, edakka, and kombu

Significance of Thrissur Pooram

- **Cultural**: Thrissur Pooram reflects Kerala's cultural ethos and strengthens community bonding
- **Religious**: Celebrated in honour of Lord Shiva at Vadakkunnathan Temple, with participation of neighbouring temples
- **Economic & Tourism**: Major attraction boosting tourism and supporting local economy (hospitality, transport, crafts)

Adi Shankaracharya

Why in News?

Adi Shankaracharya was recently commemorated on the occasion of **Shankar Jayanti**, with the Government highlighting his enduring contributions to Indian philosophy, spiritual thought, and cultural integration. His teachings continue to influence religious and philosophical discourse across India.

Who was Adi Shankaracharya?

- Adi Shankaracharya (c. **788–820 CE**, traditional dates vary) was one of India's greatest philosophers and theologians.
- Born at **Kalady** in present-day Kerala.
- Revived and consolidated the doctrine of **Advaita Vedanta**.
- Undertook extensive journeys across the Indian subcontinent to debate scholars and spread Vedantic philosophy.

Core Philosophy: Advaita Vedanta

Meaning of Advaita

- "Advaita" means **non-dualism**.
- It holds that:
  - **Brahman** is the ultimate reality.
  - **Atman (individual soul)** and Brahman are fundamentally one.
  - The perceived multiplicity of the world is due to **Maya (illusion)**.

Key Concepts

- Brahman, Atman, Maya, Moksha (Liberation), Jnana (Knowledge)

Major Contributions

1. Commentaries on Hindu Scriptures

Authored influential commentaries (**Bhashyas**) on:

- **Upanishads**
- **Bhagavad Gita**
- **Brahma Sutras**

2. Establishment of Four Mathas

To promote spiritual unity, he established four principal monasteries:

Matha	Location	Direction
Sringeri Sharada Peetham	Karnataka	South
Dwarka Sharada Peeth	Gujarat	West
Govardhan Math	Puri, Odisha	East
Jyotir Math (Joshimath)	Uttarakhand	North

3. Dashanami Order

- Organized monks into the **Dashanami Sampradaya** (ten monastic orders).

Important Literary Works

- **Vivekachudamani**
- **Upadesa Sahasri**
- **Bhaja Govindam**
- **Atma Bodha**
- **Saundarya Lahari** (traditionally attributed)

Basava Jayanti

Why in News?

- Basava Jayanti celebrated with fervour in several districts of Karnataka on **April 20, 2026** (Monday)
- Events included: singing of **Vachanas** (rhymed prose), colourful processions, motorcycle rallies, religious and cultural programmes

Who was Basaveshwara (Basavanna)?

Time Period

- 12th century (born: 1131 CE – died: 1167 CE, traditionally)
- **Social reformer, philosopher, poet, and statesman**

Key Contributions

Anubhava Mantapa (The "Hall of Spiritual Experience")

- Established in **Basavakalyan, Karnataka**
- Considered the **first parliament in the world** – where men and women from all backgrounds discussed social, religious, and economic issues freely
- Forerunner to modern democratic institutions

Social Reforms

- Opposed **caste system** and social discrimination
- Advocated for **equality of all human beings**
- Fought against **gender discrimination** – promoted women's empowerment

Religious Reforms

- Rejected **ritualistic practices** and blind faith
- Promoted **Kannada language** over Sanskrit for spiritual discourse
- Advocated **Ishtalinga** (personal linga) for direct devotion

Literary Contribution

- Composed **Vachanas** (rhymed prose in Kannada) – simple, direct, and powerful critique of social evils
- His Vachanas remain popular and are sung in chorus during celebrations

Basavanna's Legacy

Lingayat/Veerashaiva Tradition

- Considered the **founding saint** of the Lingayat (Veerashaiva) tradition

Sharanas (Companions)

- Worked with other social reformers: **Allama Prabhu, Akka Mahadevi, Channabasavanna, Siddharama**

Modern Recognition

- **Statue of Basaveshwara** installed at the **Indian Parliament** (dedicated by Prime Minister Modi in 2024) – first time a statue of a social reformer was installed in Parliament complex by the government

Spring Harvest Festivals of India

Why in News?

- India is celebrating a series of traditional New Year and harvest festivals in **April 2026**, marking the onset of spring and the solar new year
- **Mesha Sankranti** (transition of Sun into Aries) occurred on **April 14, 2026**, triggering these celebrations across different regions

What is Mesha Sankranti?

Astronomical Basis

- Marks the transition of the Sun into the zodiac sign of **Aries (Mesha)**
- Occurs around **April 14-15** every year
- Forms the basis for most traditional solar New Year festivals in India

Fluctuating Dates

- Because festivals are governed by solar and lunisolar calendars, exact dates vary between April 14 and 15
- Based on local sunrise and tithi (lunar day) calculations

Major Spring Festivals of India

Puthandu (Tamil New Year)

- Puthandu (April 14) marks **the start of Chithirai in Tamil Nadu**, celebrated with **kolams, Mangai-pachadi symbolising life's flavours,** and greetings "**Puthandu Vaazhthugal."**

Baisakhi (Vaisakhi)

- Baisakhi (April 14) **marks the wheat harvest, Sikh Khalsa formation by Guru Gobind Singh in 1699, the Hindu solar New Year, and is linked to the Jallianwala Bagh massacre.**

Vishu (Malayalam New Year)

- Vishu (April 15, 2026) marks the **start of Medam in Kerala's solar calendar**, symbolising the equinox, and is celebrated with **Vishukkani, Vishukaineettam, and the Vishu Sadya feast.**

Bohag Bihu (Rongali Bihu)

- Rongali Bihu (April 15, 2026) in **Assam** marks the **harvest season with a seven-day festival (Xaat Bihu**), including **Goru Bihu** for livestock and **Manuh Bihu** for seeking elders' blessings.

Poila Boishakh (Naba Barsha)

- Poila Baisakh (April 15, 2026) marks the **Bengali New Year in West Bengal**, beginning the financial year **(Haal Khata)** with greetings **"Shubho Noboborsho,"** and is the second biggest festival after Durga Puja.

Other Regional New Year Festivals

- **Pana Sankranti** – Odisha (April 14)
- **Ugadi** – Telangana, Andhra Pradesh, Karnataka (celebrated in March/April)
- **Gudi Padwa** – Maharashtra (celebrated in March/April)
- **Navreh** – Kashmiri Pandits (celebrated in March/April)
- **Losoong** – Sikkim (Bhutia and Lepcha communities)
- **Cheiraoba** – Manipur
- **Buisu** – Tripura

Common Themes and Significance

Shared Values Across Festivals

- **Renewal and new beginnings:** All festivals symbolise fresh start, introspection and spiritual grounding
- **Gratitude for harvest:** Farmers express thanks for a bountiful harvest
- **Family and community:** Traditions involve seeking blessings from elders, sharing meals, and community gatherings
- **Prosperity and abundance:** Rituals involving gold, grains, and auspicious items symbolise hopes for prosperity

Common Ritual Elements

- **Auspicious sighting:** Vishukkani (Kerala), Kanni (Tamil Nadu)
- **Special dishes:** Each region has distinctive festive cuisine
- **Cleaning and decoration:** Homes cleaned and decorated with kolams, rangoli or flower arrangements
- **Temple visits and prayers**

DEFENCE & SECURITY

INS Taragiri

News Context:

INS Taragiri, the fourth ship of the **Project 17A (Nilgiri-class)** stealth frigates, was commissioned into the Indian Navy on **April 3, 2026**, at **Visakhapatnam, Andhra Pradesh**, by Raksha Mantri Shri Rajnath Singh. The warship has been designed by the **Warship Design Bureau** and built by **Mazagon Dock Shipbuilders Limited (MDL)**, with over **75% indigenous content** and support from **200+ MSMEs**. The commissioning comes at a time when India is actively securing critical sea lanes, choke points, and undersea digital infrastructure.

Key Details & Important Facts:

- **Vessel Name: INS Taragiri** (meaning: "Arrow of the Sea" / Mountain peak in Kumaon)
- **Class: Project 17A (Nilgiri-class)** – fourth of seven frigates
- **Displacement:** Approximately **6,670 tonnes**
- **Designer: Warship Design Bureau** (Indian Navy)
- **Builder: Mazagon Dock Shipbuilders Limited (MDL)**, Mumbai
- **Commissioning Location: Visakhapatnam** (Eastern Naval Command)
- **Indigenous Content: >75%** (highest among P17A ships)
- **Propulsion:** Combined Diesel or Gas (CODOG) + Integrated Platform Management System
- **Key Weapon Systems:**
  - **BrahMos** supersonic surface-to-surface missiles
  - Medium Range Surface-to-Air Missiles (MR-SAM)
  - Indigenous Anti-Submarine Warfare (ASW) suite
- **Stealth Features:** Reduced Radar Cross-Section (RCS) – modular, sleek design
- **Fleet Assignment: Eastern Fleet** (Eastern Seaboard)
- **Predecessor:** Leander-class frigate (commissioned 1980) – same name
- **Strategic Context:** Aligned with **MAHASAGAR** (Maritime vision – Maritime-Harbours-Alliance-Security-Action-Growth-Anticipation-Regional) and India's **Indo-Pacific** posture

DIVEX-2026

Why in News?

- **INS Nireekshak**, the Diving Support and Submarine Rescue Vessel of the Indian Navy, arrived at **Colombo, Sri Lanka** on **April 21, 2026** to participate in the **4th edition of IN-SLN DIVEX 2026**
- The bilateral diving exercise is scheduled from **April 21 to 27, 2026**

About INS Nireekshak

- A Diving Support and Submarine Rescue Vessel of the Indian Navy, equipped with recompression chambers and a diving bell for submarine rescue and saturation diver training.
- Has undertaken multiple training deployments to Sri Lanka (2019, 2022, 2023).

Exercise Objectives and Activities

- Joint diving operations and training to boost interoperability and share best practices.
- Ceremonial welcome with naval honors and official interactions with senior Sri Lankan Navy leadership.
- Social, sports, and yoga engagements to strengthen camaraderie and goodwill between both navies.

Humanitarian and Security Assistance

- Under the **Aarogya Maitri initiative**, India will provide two **BHISM cubes**—portable medical units capable of handling ~200 emergencies with essential supplies—to Sri Lanka.
- The Indian Navy will also supply 50,000 rounds of 9 mm ammunition to enhance maritime security cooperation.

Strategic Significance

- The exercise supports **India's MAHASAGAR vision**, promoting collective growth and security in the Indian Ocean Region.
- It aligns with the **Neighbourhood First policy**, strengthening ties and capacity-building with Sri Lanka.
- It reflects a deep **India–Sri Lanka maritime partnership**, reinforcing **regional stability and cooperation.**

GOVT. INITIATIVES, SCHEMES AND POLICIES, ORGANISATION

Pradhan Mantri Janjatiya Vikas Mission (PMJVM)

News Context:

The Ministry of Tribal Affairs provided an update on the **Pradhan Mantri Janjatiya Vikas Mission (PMJVM)** in a Rajya Sabha response. The scheme, implemented through **TRIFED**, aims to strengthen tribal entrepreneurship and livelihood opportunities by promoting efficient use of natural resources and tribal product-based enterprises. The update highlighted progress on **Van Dhan Vikas Kendras (VDVKs)** and the **Minimum Support Price (MSP) for Minor Forest Produce (MFP)** scheme.

Key Details & Important Facts:

- **Implementing Agency: TRIFED** (Tribal Co-operative Marketing Development Federation of India) under Ministry of Tribal Affairs.
- **Duration:** 2021-22 to 2025-26.
- **Geographical Coverage:** Implemented in **25 States and 3 UTs** via State Nodal Departments (SNDs) and State Implementing Agencies (SIAs).
- **Van Dhan Vikas Kendras (VDVKs):**
  - **Sanctioned:** 4,172 VDVKs
  - **Tribal Members:** 12.48 lakh
  - **Operationalized:** 2,817 VDVKs
  - **Sales Reported:** ~Rs. 158 crore
- **MSP for MFP:**
  - **Items Covered: 87** Minor Forest Produce items.
  - **Procurement (since 2013-14):** 2,67,954 MT worth **Rs. 693.98 crore**.
- **Infrastructure Support:** Funds for **godowns, haat bazaars (local markets), and cold storage** to reduce wastage and improve market access.

Bhu Bharati Portal: India's First Mandatory Land Map Integration in Passbooks

News Context:

Telangana has become the **first state in India** to make the inclusion of **land maps in passbooks mandatory** upon completion of land transactions.

The move aims to prevent **"Vivat Kabja"** (mismatch between passbook holding and actual possession), eliminate double registration, and assign a **Unique Land Parcel Identification Number (ULPIN)**, locally called **Bhudhaar**.

Key Details & Important Facts:

- **Legislative Basis: Telangana Bhu Bharati (Record of Rights in Land) Act, 2025**
- **Key Provisions (Sections 5, 7, 8, 10):** Mandatory submission of survey/sub-division map along with mutation, inheritance, and other transaction applications.
- **Unique Feature:** Maps incorporated directly into **passbooks** – first such initiative in India.
- **Unique ID: Bhudhaar** (local name) / **ULPIN** (Central Government term – Unique Land Parcel Identification Number).
- **Objective:**
  - Prevent "Vivat Kabja" (possession vs. record mismatch)
  - Eliminate double registration of land parcels
  - Enable landowners to check boundaries online via Revenue department website
- **Model Adopted: Karnataka model** (successful implementation of map incorporation before registration).
- **Additional Benefit:** Facilitates **incremental survey** of agricultural lands in villages – overcomes the impediment of completing full resurvey under the **Record of Rights Act, 1948**.

One Health: India's Integrated Shield Against Future Pandemics

Why in News?

India is strengthening its **National One Health Mission (NOHM)** to improve preparedness against future pandemics, zoonotic diseases, antimicrobial resistance (AMR), and emerging health threats arising from the human-animal-environment interface. The approach has gained greater significance after COVID-19, Avian Influenza, Nipah outbreaks, and Lumpy Skin Disease in cattle.

What is One Health?

- An integrated and multidisciplinary approach that recognizes the interdependence of:
  - **Human Health**
  - **Animal Health**
  - **Environmental Health**
- Promotes coordinated action among health, veterinary, wildlife, agriculture, and environmental sectors.

Why is One Health Important for India?

- India has one of the world's largest livestock populations and rich biodiversity.
- Increasing human-wildlife interactions raise the risk of **zoonotic diseases**.
- Nearly **75% of emerging infectious diseases** globally are zoonotic in origin.

National One Health Mission (NOHM)

- Led by the **Office of the Principal Scientific Adviser (PSA)**.
- Vision: Build an integrated disease-control and pandemic-preparedness system.
- Focus Areas:
  - Integrated disease surveillance
  - Early warning systems
  - Outbreak investigation
  - Vaccine, diagnostic, and therapeutic R&D
  - Data-sharing across sectors
  - Network of BSL-3 and BSL-4 laboratories.

Key Diseases Covered

- Rabies
- Avian Influenza (H5N1)
- Nipah Virus
- Anthrax
- Brucellosis
- Kyasanur Forest Disease (KFD)
- Scrub Typhus.

DPI@2047 Roadmap: NITI Aayog's Strategic Vision for Viksit Bharat

Why in News?

The **NITI Frontier Tech Hub (NITI Aayog)** launched the **"DPI@2047 for Viksit Bharat: A Strategic Roadmap to Enable Non-linear Inclusive Socio-economic Growth"** in April 2026. The roadmap outlines how India can leverage Digital Public Infrastructure (DPI) to achieve the goal of becoming a developed nation by 2047.

What is Digital Public Infrastructure (DPI)?

- DPI refers to interoperable digital systems that provide essential public and private services at scale.
- India's DPI ecosystem is built around:
  - **Aadhaar** (Digital Identity)
  - **UPI** (Digital Payments)
  - **DigiLocker** (Digital Documents)
  - **CoWIN**, **ONDC**, **Account Aggregator Framework** etc.

Key Features of DPI@2047 Roadmap

1. Two-Phase Strategy

- **DPI 2.0 (2025–2035):** Focus on livelihood-led and productivity-driven growth.
- **DPI 3.0 (2035–2047):** Focus on innovation-led prosperity and grassroots economic transformation.

2. Eight Sectoral Transformations

The roadmap targets structural bottlenecks in:

- MSMEs
- Agriculture
- Education
- Healthcare
- Credit Access
- Benefit Delivery
- Job Discovery
- Decentralized Energy Markets

3. Four Key Execution Imperatives

- District-level demand aggregation.
- Scaling technology entrepreneurship.
- AI-enabled public services.
- Cross-sector data sharing and digital transaction expansion.

Significance

- Moves India from **welfare delivery to wealth creation**.
- Seeks inclusive, population-scale growth through digital platforms.
- Supports the broader vision of **Viksit Bharat@2047** and a high-income economy.

Small Hydro Power (SHP) Development Scheme (2026–31)

News Context:

The Union Cabinet approved the **Small Hydro Power Development Scheme (2026–31)** with an outlay of ₹2,584.60 crore to boost decentralised renewable energy, especially in hilly and North-Eastern regions

Key Features & Facts

- **Definition:** SHP = Hydropower projects up to **25 MW** (under MNRE).
- **Target:** Addition of ~**1,500 MW** capacity.
- **Current Status:** Installed ~**5,171 MW** vs potential **21,133.61 MW** (~24.5% utilised).
- **Financial Support:**
  - NE & border areas: ₹3.6 crore/MW (max ₹30 crore/project)
  - Others: ₹2.4 crore/MW (max ₹20 crore/project)
- **Investment Potential:** ₹15,000 crore; **51 lakh person-days employment**
- **DPR Support:** ₹30 crore for ~200 projects

Significance of SHP

- **Decentralised Power:** Reduces transmission losses, ideal for remote areas
- **Reliable Energy:** Provides Round-The-Clock (RTC) power (unlike solar/wind)
- **Eco-friendly:** Minimal displacement, low ecological footprint
- **Rural Development:** Boosts livelihoods and local economies

Important Concepts

- Run-of-the-river projects
- Canal-based / dam-toe SHP
- Grid stability & energy security
- Atmanirbhar Bharat (indigenous manufacturing)

NAMASTE Scheme

Why in News?

The Ministry of Social Justice and Empowerment highlighted the achievements of the **NAMASTE (National Action for Mechanised Sanitation Ecosystem) Scheme**, which has significantly improved the safety, dignity, and livelihoods of sanitation workers through mechanisation, social security, and skill development interventions.

What is the NAMASTE Scheme?

- **NAMASTE** stands for **National Action for Mechanised Sanitation Ecosystem**.

- A **Central Sector Scheme** jointly implemented by:
  - Ministry of Social Justice and Empowerment (MoSJE)
  - Ministry of Housing and Urban Affairs (MoHUA)
- Launched in **2023** for implementation across **4,800+ Urban Local Bodies (ULBs)**.
- Seeks to eliminate hazardous manual cleaning of sewers and septic tanks through mechanisation.

Objectives

- Achieve **zero fatalities** in sanitation work.
- End direct human contact with sewage and faecal matter.
- Promote mechanised cleaning practices.
- Provide social security, health coverage, and sustainable livelihoods.
- Enable sanitation workers to become entrepreneurs and skilled service providers.

Key Components

1. Profiling and Identification

- Comprehensive database of sewer and septic tank workers.

2. Safety Measures

- Distribution of **Personal Protective Equipment (PPE)** kits.
- Occupational safety training.

3. Health Protection

- Coverage under **Ayushman Bharat–PMJAY** and other health insurance schemes.

4. Mechanisation Support

- Financial assistance for procurement of mechanised cleaning vehicles and equipment.
- Support to **Emergency Response Sanitation Units (ERSUs)**.

5. Inclusion of Waste Pickers

- Since **June 2024**, waste pickers have been included as beneficiaries under the scheme.

Recent Achievements

- Over **90,000 sewer and septic tank workers** profiled.
- More than **87,000 PPE kits** distributed.
- Over **76,000 workers** covered under health insurance.
- Capital subsidies provided for mechanised sanitation enterprises.
- More than **3.7 lakh waste pickers** profiled under the expanded scheme.

River Basin Management Scheme

Why in News?

- RBM Scheme to continue from **2026-27 to 2030-31** with a budget of **₹2,183 crore** (fully funded by government)
- Previous phase (2021-26): ₹1,276 crore
- Focus on **Brahmaputra, Barak, Teesta, and Indus** basins

What is RBM Scheme?

- **Central Sector Scheme** under Ministry of Jal Shakti
- Aims: **Integrated planning, investigation, and development** of water resources at river basin level (surface + groundwater)

Implementing Agencies

- **Brahmaputra Board** – Master Plan, flood control, anti-erosion (e.g., Majuli Island protection)
- **Central Water Commission (CWC)** – Surveys, Detailed Project Reports (DPRs)
- **NWDA** – Interlinking of Rivers (ILR) studies

Priority Areas

- North Eastern Region basins
- Indus Basin (J&K / Ladakh)
- States with capacity gaps: J&K, Sikkim, Mizoram, Manipur, Nagaland

Key Achievements (2021-26)

Activity	Progress
ILR Projects	30 links identified; FRs for 26; DPRs for 15 links
Majuli Island	Anti-erosion protection works completed
DPRs	Prepared for Brahmaputra, Barak, Teesta, Indus basins
Community work	Springshed management in hilly North East

Modern Tools Used

- GIS, Remote sensing, LiDAR, Drone-based surveys, Hydrological modelling

Divya Bharat

Why in News?

- **NITI Aayog** launched an anthology titled **"Divya Bharat: A Window to the Soul of India"** on **April 17, 2026**

What is Divya Bharat?

Nature

- A comprehensive anthology (collection of writings) presenting India's tourism offerings
- Conceived as a **year-round companion for travellers**

Key Features

- Presents destinations through a **unique seasonal lens** – aligning with the rhythm of months
- Covers **all States and Union Territories**
- Includes: iconic landmarks, heritage sites, cultural traditions, festivals, cuisines, and **lesser-known destinations**

Philosophy

- Goes beyond conventional sightseeing
- Encourages **experiential journeys** – deeper engagement with local communities, traditions, and ways of life
- Promotes **balanced tourism** – travel across seasons and regions (not just peak seasons)

Objectives

- Inspire citizens and global travellers to explore India's diverse tourism landscape
- Promote **domestic awareness** and **global appeal** of India's tourism sector
- Support **local economies** and preserve cultural heritage
- Foster **greater community participation** in tourism
- Promote **longer tourist stays** (domestic and religious tourism)

MISCELLANEOUS

India's Maternal Mortality Ratio (MMR)

News Context:

A recent study published in *The Lancet Obstetrics, Gynaecology, and Women's Health* (Global Burden of Diseases study) highlights India's struggle to meet the **Sustainable Development Goal (SDG) 3.1** target of reducing Maternal Mortality Ratio (MMR) to below **70 per 1 lakh live births** by 2030, despite significant historical progress.

Key Details & Important Facts:

- **India's MMR Trend:**
  - **1990:** 508 per lakh live births
  - **2023:** 116 per lakh live births
  - **Absolute Deaths:** Reduced from 1.19 lakh (1990) to 24,700 (2023)
- **Global Context:** India accounted for **one-tenth** of global maternal deaths in 2023 (global total: 2.4 lakh).
- **Current Status:** India falls in the **100–140 MMR** range of countries yet to meet the SDG target.
- **Regional Disparity (SRS Data 2021-23):**
  - **National:** 88
  - **Uttar Pradesh (pulling factor):** 141
  - **Assam (pulling factor):** 110
- **Major Causes:** Haemorrhage and hypertensive disorders account for over **40%** of maternal deaths—both largely preventable.
- **Data Contradiction:** UN Maternal Mortality Estimation Inter-Agency Group estimates India's MMR at **80** for 2023, while the Sample Registration System (SRS) places it at **88**.

Panchayat Advancement Index (PAI) 2.0 Report

Why in News?

- Ministry of Panchayati Raj released **PAI 2.0 Report** for FY 2023-24 on **National Panchayati Raj Day (April 24, 2026)**
- Serves as a **report card for each Panchayat**
- Record national participation: **97.3%** (2,59,867 Gram Panchayats across 33 States/UTs)
- Significant improvement from PAI 1.0 (80.79% participation)

What is PAI 2.0?

Definition

- India's **first nationwide data-driven framework** to assess Gram Panchayat performance
- Evaluates over **2.5 lakh Gram Panchayats** against:
  - **150 indicators**
  - **230 data points**
  - **9 thematic areas**

Thematic Areas (Localisation of SDGs – LSDGs)

1. Poverty – free and enhanced livelihoods
2. Healthy Panchayat
3. Child-friendly Panchayat
4. Water-sufficient Panchayat
5. Clean and Green Panchayat
6. Self-sufficient infrastructure
7. Social justice and empowerment
8. Good governance
9. Women-friendly Panchayat

Performance Categories (Composite PAI Score)

Category	Grade	Score Range
Achiever	A+	90 and above
Front Runner	A	75 to below 90
Performer	B	60 to below 75
Aspirant	C	40 to below 60
Beginner	D	Below 40

Other Features

- Single integrated data entry form
- Soft and cross-data validation mechanisms
- Real-time dashboards for intuitive navigation

Significance and Uses

- **Evidence-based planning** for Panchayati Raj Institutions
- **Performance monitoring** and **incentivising** PRIs
- **Prioritising development interventions** by States/UTs
- **Supporting preparation of Gram Panchayat Development Plans (GPDPs)**
- **Identifying high-performing Panchayats** as learning hubs and best practice models

Alignment with National Vision

- Strengthening Panchayati Raj Institutions
- Advancing vision of **"Viksit Gram Panchayats"** (aligned with **Viksit Bharat 2047**)
- **Localisation of Sustainable Development Goals (LSDGs)** – localization of SDGs at grassroots level

Doping Crisis in India

Why in News?

- The Athletics Integrity Unit has downgraded India to Category A (highest doping risk) from Category B after it ranked among the top two globally in ADRVs for four straight years (2022–2025).

Overall Doping Cases (All Sports - 2024)

- India recorded **260 athletes testing positive** for banned substances in 2024 – highest in the world
- No other country reported triple-digit violations
- Positivity rate: **3.6%** – significantly higher than China despite fewer tests

Sport-wise Breakup (2024)

- Athletics: 76 cases (highest)
- Weightlifting: 43 cases
- Wrestling: 29 cases

Source: WADA Annual Report

What Does 'Category A' Mean?

Definition (Rule 15, World Athletics Anti-Doping Rules)

- Category 'A' represents the **highest doping risk**
- Subject to **more stringent anti-doping requirements**, including:
    - Minimum testing requirements for national team athletes
    - In-competition and out-of-competition testing

- Pre-competition blood testing for Athlete Biological Passport (ABP)
- Samples must be analysed by WADA-accredited laboratories

Other Countries in Category A

- Russia, Kenya, Ethiopia, Belarus, Bahrain, Nigeria, Ukraine

Government and Institutional Response

National Anti-Doping Agency (NADA)

- Primary body implementing anti-doping rules in India
- Increased testing from ~4,000 samples (2019) to ~8,000 (2025)
- However, testing volume remains low compared to China (15,000+ annually)

Legal Framework

- **National Anti-Doping Act, 2022** – provides statutory backing
- **National Anti-Doping (Amendment) Bill, 2025** – introduced in Lok Sabha (July 23, 2025)
  - Seeks to incorporate **Article 2 of World Anti-Doping Code** into domestic law
  - Strengthens institutional independence of NADA and Appeal Panel
  - Allows appeals to **Court of Arbitration for Sport (CAS)**

Criminalisation of Doping (Proposed)

- Sports Minister **Mansukh Mandaviya** announced government working towards introducing **criminal provisions** against those involved in administering or trafficking banned substances
- Aims to target **suppliers, coaches, and networks** – not just athletes

Implications for Indian Sports

Athletes

- Indian track and field athletes will now face **stricter testing protocols** for international events
- Mandatory testing for all national team athletes competing in World Athletics Series Events, Olympics, or World Athletics Ultimate Championship

Olympic and Commonwealth Games Aspirations

- India is set to host **2030 Commonwealth Games** and aiming to host **2036 Olympics**
- Doping issue has been **flagged by IOC** as a key area of improvement
- WADA compliance is essential for hosting major international events

International Standing

- India has surpassed Kenya to top AIU's list of ineligible persons due to doping violations with **148 suspended athletes**
- The downgrade is a **"red flag"** for India's sporting ambitions

Civil Services Day 2026

Why in News?

- **April 21, 2026** – Civil Services Day celebrated across India
- Theme 2026: **"Viksit Bharat: Citizen-Centric Governance and Development at the Last Mile"**

Why April 21?

- Commemorates the day when **Sardar Vallabhbhai Patel** (first Home Minister of independent India) addressed probationers of Administrative Services Officers in **1947** in Delhi
- Patel referred to civil servants as the **"steel frame of India"**

Significance of Civil Services Day

- Annual occasion for civil servants to **rededicate themselves** to the cause of citizens
- Renew commitments to **public service and excellence in work**

- Celebrated by central government on **April 21 every year**

FIFA World Cup 2026

Why in News?

- The **23rd FIFA World Cup** will be held from **June 11 to July 19, 2026**, marking the first edition with **48 teams** (expanded from 32) and **104 matches**
- For the first time, the tournament is co-hosted by **three countries**: United States, Canada, and Mexico
- The opening match will take place at **Estadio Azteca in Mexico City** (capacity 87,000) on June 11
- The final will be held at **MetLife Stadium in East Rutherford, New Jersey** on July 19

World Cup Debutants

- Curacao, Cape Verde, Uzbekistan, Jordan

Iran's Participation Controversy

Geopolitical Tensions

- Iran qualified for World Cup but requested to move matches from USA to Mexico citing security concerns after US-Israeli offensive (February 28, 2026)
- **FIFA rejected the request** – "no plan B, C, or D"
- Iran's Sports Minister stated country "could not take part under any circumstances"
- US President Donald Trump said Iran's team would be welcome but "not appropriate for their own life and safety"
- **Current status:** FIFA President Infantino confident Iran will participate; team scheduled to face New Zealand, Belgium (Los Angeles) and Egypt (Seattle)

India's Absence

- **India did not qualify** for World Cup 2026
- Finished **third in qualifying group** behind Qatar and Kuwait
- Indian football team has **never featured** in the FIFA World Cup
- Only close call: Qualified for 1950 Brazil World Cup but withdrew before tournament

Key Milestones

- **1,000th FIFA World Cup match** – Tunisia vs. Japan on June 20 in Monterrey (reprise of 2002 match that sent Japan to knockout stage for first time)
- **Smallest nation ever** – Curacao (population ~150,000)
- **Record tournament length** – 39 days
- **Record number of matches** – 104

MAINS

PAPER 1

Protection and Conservation of Monuments in India

Introduction

India's cultural landscape reflects thousands of years of civilisational evolution. The Archaeological Survey of India (ASI) safeguards 3,686 centrally protected monuments. Heritage conservation is increasingly integrated with tourism, local livelihoods, and cultural diplomacy. India now has 44 UNESCO World Heritage Sites, including the recent addition of the Maratha Military Landscapes (July 2024). The National Policy for Conservation (2014) guides scientific preservation.

Main Body

Legislative and Constitutional Framework

- **Article 49 (Duty of State):** Protect monuments of national importance.
- **Seventh Schedule:** Union List (Entry 67) – monuments of national importance (ASI); State List (Entry 12) – state-level monuments.
- **Article 51A(f) (Fundamental Duty):** Citizens to value and preserve heritage.
- **AMASR Act, 1958:** Declares protected monuments, regulates construction in prohibited zone (100 metres) and regulated zone (200 metres beyond).
- **National Policy for Conservation (2014):** Scientific conservation, minimal intervention, integration of traditional materials with modern techniques.

Institutional Framework

- **Archaeological Survey of India (ASI) – 1861:** Principal organisation for archaeological research and protection. Safeguards 3,686 centrally protected monuments. Network of 38 Circles. Conservation expenditure (2024-25): ₹374 crore.
- **National Mission on Monuments and Antiquities (NMMA) – 2007:** Documented 11,406 Built Heritage Sites and 12.48 lakh antiquities.

Tangible and Intangible Heritage

- **Tangible:** Historic structures (Taj Mahal, Sanchi Stupa). Protected under AMASR Act, 1958.
- **Intangible:** Living traditions (Yoga, Vedic chanting). Safeguarded under UNESCO Convention, 2003.

Emerging Conservation Frameworks

Adopt a Heritage 2.0 (2023):

- Corporate Monument Mitras upgrade visitor amenities (cleanliness, accessibility, illumination, signage).
- Conservation remains exclusive mandate of ASI.
- Sites include Agra Fort, Qutub Minar, Ajanta Caves, Red Fort.

Heritage-linked Festivals:

- Konark Dance Festival, Khajuraho Dance Festival, Modhera Dance Festival.
- Generate local livelihoods (hospitality, handicrafts, transport).

Technology-Supported Conservation:

- 3D laser scanning, photogrammetry, drone surveys, GIS mapping, AI-enabled platforms.

Kedarnath Temple (post-2013 disaster):

- ASI structural conservation + IIT Chennai geotechnical assessment using MASW (Multi-Channel Analysis of Spectral Waves).

Indian Culture Portal:

- Virtual walkthroughs and 360-degree virtual tours (e.g., Qutub Minar Complex).

UNESCO World Heritage Sites

- **44 total:** 36 Cultural, 7 Natural, 1 Mixed.
- **Most recent (July 2024):** Maratha Military Landscapes.

Conclusion

India safeguards 3,686 monuments through ASI, supported by modern technologies such as 3D scanning, drones, GIS, and AI. With 44 UNESCO World Heritage Sites, heritage conservation is increasingly linked to tourism, livelihoods, cultural diplomacy, and India's soft power.

Rainfall Deficit Forecast: Preparing for the Worst

Introduction

After two surplus years, India may face a monsoon shortfall, with IMD projecting an 8% deficit (below normal rainfall). Past trends show April deficit warnings can turn into drought, as in 2015. An emerging El Niño and West Asia–linked fertiliser shortages may worsen the impact, making early preparedness essential.

Main Body

The Forecast: Below Normal Monsoon

IMD April Forecast:

- 8% deficit (below normal) for June-September 2026
- Rainfall expected at 89-96% of Long Period Average (LPA)
- 5% margin of error

IMD's Track Record:

- When IMD warns of deficit in April, India often experiences drought
- In 2015: IMD forecast 93% LPA ("below normal"); India ended at 86% LPA (deficient)
- The agency never uses 'drought' – only "deficient" for below 90%

The Concern:

- More times IMD has expected 'normal' monsoon only for India to end with drought
- Than it has forecast drought and been proved wrong

The El Nino Factor: Timing Matters

What Is El Nino:

- Heating of central equatorial Pacific Ocean beyond 1°C
- Corresponds to deficient monsoon 9 out of 16 times since 1950

Why Timing Matters:

- If temperature rise happens outside monsoon months, impact is less threatening
- 2019 example: IMD expected below normal due to El Nino-like conditions
- Paradoxically, India ended with above normal because heating was not as strong as expected

This Year's Projection:

- El Nino expected to depress second half of monsoon (August-September)
- Indian Ocean Dipole may counter desiccating impact of El Nino (uncertain)

Compounding Factors: War and Input Shortages

West Asia War Impacts:

- Shortage of gas and fertiliser (already disrupted)
- Rising fuel prices affecting farm machinery and transport
- Fertiliser availability for Kharif season uncertain

Farmer Sentiment:

- Weak rains + input shortages = double blow
- Already vulnerable rural economy faces compounded stress

IMD's Official Lexicon:

- Never uses 'drought'
- Only "deficient" (below 90%) and "below normal" (90-96%)
- But ground reality may be worse than official terminology

Immediate Preparations Needed

Fertiliser Stocks:

- Shore up domestic fertiliser availability before Kharif planting
- Diversify import sources amid West Asia disruptions
- Ensure timely distribution to farmers

Water Distribution:

- Equitable water distribution from stressed reservoirs
- Prioritise drinking water over irrigation if shortages worsen
- Inter-state water sharing mechanisms to be activated

Farmer Advisories:

- Timely advisories on optimal sowing practices for deficit conditions
- Drought-resistant crop varieties and altered cropping patterns
- Soil moisture conservation techniques

Reservoir Management:

- Monitor reservoir levels closely
- Coordinate with state governments for release schedules
- Prepare for multi-state water stress scenarios

Historical Precedent: Learning from 2015

What Happened in 2015:

- IMD forecast 93% LPA ("below normal") in April
- India ended at 86% LPA (deficient)
- Widespread drought affected Kharif and Rabi seasons

Lessons for 2026:

- IMD's April forecast tends to be optimistic
- Deficit may be worse than predicted
- Prepare for 86% LPA or lower scenario

Way Forward

For the Government:

- Assume worst-case scenario (deficient, not just below normal)
- Shore up fertiliser stocks immediately
- Activate reservoir water sharing protocols
- Issue farmer advisories before sowing begins

For Farmers:

- Shift to drought-resistant crop varieties
- Adopt soil moisture conservation techniques
- Follow IMD advisories on sowing windows

For Long-Term Resilience:

- Invest in micro-irrigation (drip, sprinkler)
- Expand water harvesting and groundwater recharge
- Develop drought early warning systems

Conclusion

After two surplus years, India faces a likely monsoon shortfall, with IMD projecting an 8% deficit. Past trends show early deficit warnings can worsen into drought, especially with El Niño risks in the latter half. Simultaneous West Asia–linked fertiliser and gas shortages may further strain agriculture.
Immediate steps—adequate fertiliser stocking, efficient reservoir management, and timely sowing advisories—are crucial. Preparedness, not panic, will determine the impact.

Buddha's Greatest Victory: Lessons for a Troubled World

Introduction

On Buddha Purnima, we honour Gautama Buddha—the "awakened one" who renounced royal life in search of truth and attained enlightenment at Bodh Gaya. His first sermon at Sarnath laid the foundation of Buddhism. Emphasising non-violence, truth, and self-discipline, his message remains deeply relevant in a world marked by conflict and unrest.

Main Body

The Core of Buddha's Teachings: Four Noble Truths and Eightfold Path

The Four Noble Truths:

- There is suffering (Dukkha) – pain, illness, loss, separation
- Desire (Tanha) is the root cause of suffering – attachment to pleasure, aversion to pain
- By eliminating desire, suffering can be overcome (Nirodha)
- By following the Eightfold Path, one can live free from suffering (Magga)

The Eightfold Path:

- Right View, Right Intention, Right Speech, Right Action
- Right Livelihood, Right Effort, Right Mindfulness, Right Concentration

The Five Moral Precepts (For Lay Followers):

- Non-violence (Ahimsa) – do not kill or harm living beings
- Non-stealing – do not take what is not given
- Refraining from adultery – sexual misconduct
- Truthfulness – speak the truth; avoid false speech
- Abstaining from intoxicants – avoid substances that cloud the mind

Key Advice from the Buddha:

- Do not dwell on the past—live in the present
- Truthfulness is powerful
- The mind is the source of all actions—cultivate positive thinking
- Do not retreat in fear during difficult times
- Words can wound—speak gently
- Love and non-violence are essential
- Always keep learning

Buddhism in Indian Literature and Culture

Tamil Buddhist Epics:

- **Manimekalai:** Explains essence of Buddhism—birth and death as sleep and waking; righteous deeds lead to noble world; evil deeds lead to suffering
- **Kundalakesi:** Another Tamil Buddhist text (lost, but contributions remain invaluable)

Ashoka's Transformation:

- Emperor Ashoka transformed from a conqueror to a proponent of peace after embracing Buddhism
- Propagated Buddhist principles through inscriptions and stupas across the land
- Sanchi and Sarnath stupas continue to attract pilgrims
- The lion capital at Sarnath is Bharat's national emblem

Spread of Buddhism:

- Ashoka's son Mahinda carried teachings to Sri Lanka
- Buddhist monks propagated faith in Tamil Nadu (traces remain)
- Monks provided free medical care and education without discrimination
- Charity, especially feeding the poor, was a fundamental duty

Buddhist Universities: India's Intellectual Legacy

Nalanda University (5th century CE):

- Around 10,000 students and 1,500 teachers

- Scholars from across Asia came to study
- Libraries of immense scale

Other Major Centres:

- Vikramashila University (Bihar)
- Odantapuri University (Bihar)
- Kanchipuram University (Tamil Nadu) – renowned centre of learning

Chinese Pilgrims:

- **Faxian:** 15-year pilgrimage specifically for Buddhism
- **Xuanzang:** 16 years in Bharat studying at Nalanda and collecting texts; visited Kanchipuram to study and copy manuscripts

Significance:

- Buddhism emphasised lifelong learning
- Established educational institutions and libraries on very large scale
- Showcased India's intellectual heights to the world

Contemporary Relevance of Buddha's Teachings

PM Modi's Message (Mann Ki Baat):

- Gautama Buddha’s message remains timeless: peace begins within, and self-mastery is the greatest victory. In today’s conflict-ridden world, his teachings are more relevant than ever.

Relevance for Ethics (GS Paper IV):

- Non-violence: Rejection of violence in thought, word, and deed
- Truthfulness: Foundation of integrity in public life
- Mindful speech: Words can wound—speak gently
- Conquering oneself: Greatest victory is self-mastery, not domination over others

Relevance for International Relations:

- India's soft power: Buddhism as a gift to the world
- Diplomatic tool: Shared Buddhist heritage with Japan, South Korea, China, Sri Lanka, Myanmar, Thailand, Vietnam, Cambodia, Laos, Nepal, Bhutan
- Alternative to conflict: Peace begins within; extends to family, community, nation, world

Relevance for Mental Health:

- "Do not dwell on the past—live in the present" (mindfulness)
- "The mind is the source of all actions—cultivate positive thinking" (cognitive behavioural principles)
- "Do not retreat in fear during difficult times" (resilience)

Buddha's Teachings on Love and Compassion

The Story of Sujata:

- Moved by compassion for the weakened Buddha after his severe austerities
- Offered him milk porridge, saving his life
- Gave him strength to meditate under the Bodhi tree
- On Buddha Purnima, we remember her love and kindness by preparing payasam

Buddha's Words on Love:

- "Love is the source of joy, love is the light of the world, love is the greatest power"

The Five Precepts in Practice:

- Non-violence: Protection of all living beings
- Non-stealing: Respect for others' property
- Refraining from adultery: Respect for relationships

- Truthfulness: Foundation of trust in society
- Abstaining from intoxicants: Mental clarity for ethical decision-making

Conclusion

On Buddha Purnima, we honour Gautama Buddha—the "Light of Asia" who taught that mastering oneself is the greatest victory. From renunciation to enlightenment at Bodh Gaya and his first sermon at Sarnath, his message offered a practical path of ethics and inner discipline. His legacy shaped figures like Ashoka and great centres of learning such as Nalanda. In a world of conflict, his teachings remind us: love and peace remain humanity's greatest strength.

PAPER 2

Judge Recusal and Judicial Sanctity: Balancing Impartiality and Institutional Integrity

Introduction

Judicial authority depends on impartiality, rooted in *nemo judex in causa sua* and the guarantee of a fair hearing under Articles 14 and 21.

Recent controversies—such as Arvind Kejriwal's failed recusal plea and the Supreme Court's reluctance to set clear guidelines—highlight tensions between judicial discretion, litigant rights, and institutional integrity.

Main Body

The Foundational Principle: Justice Must Be Seen to Be Done

The Objective Test (Ranjit Thakur v. Union of India, 1987):

- Not whether the judge is actually biased, but whether a reasonable litigant would apprehend unfairness
- The judge's own belief in impartiality is irrelevant
- Standard is objective, based on the fair-minded observer

Legal Framework: Discretion, Not Regulation

No Codified Rules:

- India has no statutory regulation governing recusal
- Process based on judicial precedents, ethics, and judge's conscience
- Restatement of Values of Judicial Life (1997) provides ethical guidance only

Supreme Court Position (2025):

- Rejected plea seeking recusal guidelines (Chandraprabha v. Union of India)
- Held recusal is "a matter of discretion of the concerned judges"
- No external authority can compel withdrawal; no appeal if judge refuses

Common Grounds for Recusal

- Pecuniary interest (direct financial stake)
- Family relationship with party or counsel
- Previous involvement as counsel in same case
- Personal bias (hostility or favouritism)
- Prior concluded opinion on exact issue

The Duty to Sit vs. Doctrine of Necessity

Duty to Sit:

- Judge should not abdicate responsibility unless grounds are legally sound
- Refusing recusal is not defiance but a safeguard against "judge-shopping"

Doctrine of Necessity:

- If recusal would lead to failure of justice due to unavailability of judges, a biased body may have to decide

When Refusal Is Justified:

- Mere allegations without substantive evidence
- Frivolous or strategic applications aimed at delay
- Dissatisfaction with judicial rulings or perceived sternness

The Kejriwal Recusal Plea (2026)

Grounds Alleged:

- Justice Sharma's attendance at events organised by Adhivakta Parishad (alleged RSS affiliation)
- RTI disclosures showing her children empanelled as Central government counsel

Court's Decision:

- Dismissed recusal application, holding no "demonstrable cause"
- Warning: stepping aside on perceived bias would set a "disturbing precedent"

Justice Abhay S Oka's View (Former SC Judge):

- Proper remedy is to apply to Chief Justice for transfer, not to "embarrass the judge in open court"
- Prima facie views during hearings do not constitute recusal grounds

The Higher Standard: "Iota of Doubt"

Advocated by Legal Commentators:

- "If there is even an iota of doubt in the mind of a reasonable litigant about impartiality, the judge has a duty to recuse"

Counter-Argument:

- "Iota of doubt" standard, if strictly applied, would paralyse the judiciary
- Every dissatisfied litigant could manufacture an apprehension
- Ranjit Thakur standard requires reasonable apprehension, not any apprehension

The NCLAT Influence Allegation (2025)

Facts:

- Justice Sharad Kumar Sharma recused himself, recording that a "revered member of higher judiciary" approached him to seek a favourable order
- Supreme Court ordered inquiry by Secretary General

Significance:

- Not about perceived bias but actual judicial interference
- Goes to the heart of judicial independence

Way Forward: Transparency, Not Codification

- Judges should disclose potential conflicts at the outset
- Proper remedy for litigants: apply to Chief Justice for transfer
- Frivolous recusal applications may attract costs (Neeti Sharma v. Kailash Chand Gupta, Delhi HC, 2025)
- Law Commission could examine a Judicial Ethics Code with clear recusal guidelines

Conclusion

Recusal jurisprudence balances judicial independence with litigant rights, guided by the principle that justice must be seen to be done. The *Ranjit Thakur* test allows recusal only on reasonable apprehension of bias, while the duty to sit guards against misuse. Yet, structural conflicts can undermine perceived impartiality. The dismissal of Arvind Kejriwal's plea underscores judicial discretion, but concerns of bias persist. The solution lies in transparency—clear disclosures, reasoned orders, and effective case transfers.

Constitution (131st Amendment) Bill, 2026

Introduction

The Constitution (131st Amendment) Bill, 2026 failed to secure the two-thirds majority under Article 368, leading to its defeat and the shelving of the Delimitation Bill.

This outcome highlights the constitutional safeguard against pushing major structural changes without broad consensus. The government's approach—linking women's reservation to delimitation based on the 2011 Census—raised federal concerns and overlooked key recommendations on Centre–State relations.

Main Body

The Constitutional Amendment Dimension: Article 368

The Two-Thirds Safeguard:

- Article 368 requires special majority: majority of total membership + two-thirds of members present and voting
- For amendments affecting federal provisions, ratification by half the States is also required (Article 368(2))
- The 131st Amendment fell at the first hurdle itself

Basic Structure Dimension:

- The Supreme Court in *Kesavananda Bharati (1973)* held that federalism is part of the basic structure
- *S.R. Bommai (1994)* reaffirmed that any amendment violating federal principles can be struck down
- A delimitation that disproportionately reduces representation of certain States could potentially violate this principle

Centre-State Relations: The Federal Fault Line

Constitutional Framework of Delimitation:

- Article 81: Lok Sabha seats allocated to States based on population
- 42nd Amendment (1976) and 84th Amendment (2002) froze delimitation until first Census after 2026
- Rationale: Incentivise population stabilisation without penalising successful States

The North-South Asymmetry:

- Southern States (Tamil Nadu, Kerala, Karnataka, Andhra, Telangana) stabilised population growth decades ago
- Northern States (UP, Bihar, MP, Rajasthan) continue to have higher fertility rates
- A strict population-based delimitation would reduce southern seats and increase northern seats

The Bill's Language:

- Mandated delimitation based on latest Census (2011)
- Would have reduced share of southern, eastern, and northeastern States
- Contradicted the spirit of the 84th Amendment (2002)

Related Committees and Their Recommendations

Sarkaria Commission (1983-1988):

- Recommended that delimitation should not penalise States that controlled population growth
- Emphasised federal balance requires protection of smaller and economically advanced States

Punchhi Commission (2007-2010):

- Reaffirmed federalism as basic feature of the Constitution
- Recommended extensive consultation with States before any delimitation exercise
- Suggested demographic performance should be rewarded, not penalised

84th Amendment (2002):

- Froze delimitation until first Census after 2026
- Explicitly linked to "progress of family planning programmes in different parts of the country"
- The 131st Amendment sought to negate this rationale without fresh assessment

Way Forward

Constitutionally Mandated Route:

- Complete the 2026-27 Census (currently underway)
- Refer delimitation to a Joint Parliamentary Committee for genuine consensus
- Follow the precedent of the 84th Amendment (2002) which was passed after extensive consultation

Women's Reservation:

- The 106th Amendment (2023) already provides for it
- Implementation requires delimitation, but delimitation need not be controversial

- Consensus can be built through proper process

Federal Principle:

- Balance democratic equality ("one vote, one value") with federal fairness
- The Demographic Performance (DemPer) principle could be a way forward
- The Finance Commission already uses multiple criteria beyond population

Conclusion

The defeat of the Constitution (131st Amendment) Bill, 2026 is not a legislative failure but a constitutional safeguard in action. The two-thirds requirement under Article 368 prevented a rushed approach to delimitation based on the 2011 Census, without consensus or regard for federal concerns.
The way forward lies in completing the Census, building parliamentary consensus, and following constitutional processes.

Institutionalised Sluggishness: Reimagining India's Legal System

Introduction

With over five crore pending cases, India's judicial system has made "justice delayed is justice denied" a lived reality. For ordinary citizens, legal processes are slow, costly, and exhausting—where "the process itself becomes punishment." Judicial reform is no longer a sectoral issue but a human rights imperative, requiring a fundamental overhaul of how justice is delivered.

Main Body

The Weight of Pendency

The Scale:

- Over five crore cases pending across Indian courts
- System has become its own worst enemy

The Consequence:

- Emboldens the lawbreaker
- Exhausts the law-abiding
- A land dispute taking 20 years: winner often finds victory hollow, having spent more on legal fees than the property was worth

The Human Cost:

- Individuals charged with grave offences, eventually acquitted, find their lives in ruins
- Prime years spent behind bars without compensation
- "The process is the punishment"

Procedural Bottlenecks and Adjournment Culture

The Cycle:

- Frequent, often frivolous adjournments
- Gravitational pull keeping cases in limbo for decades
- Strips accused of dignity, livelihood, and social standing long before verdict

UAPA Detainees:

- Those charged under Unlawful Activities (Prevention) Act languish in overcrowded prisons without trial
- Prima facie evidence standard makes incarceration the rule, not the exception
- Need for mandatory guidelines fixing firm timeline (1-2 years) for trial commencement or bail

The Digital Revolution: From Colonial-Era Courts to 21st Century

The Problem:

- Courts operate as if frozen in colonial era
- Reliant on mountains of physical files
- Personal presence of litigants travelling hundreds of miles just to hear a new hearing date

The Solution:

- AI and data-driven case management as necessary tools, not luxuries

- AI handling routine administrative filing, flagging delays, assisting in legal research
- Allows judges to focus cognitive energy on the heart of the matter

Inclusivity and Accessibility: Beyond Speed

Composition of the Bench:

- Judiciary criticised as insular "old boys' club"
- Glass ceiling for women and marginalised communities remains intact
- Too many judges being relatives of earlier generations

Why Representation Matters:

- Not identity politics—judicial quality
- Bench that understands lived realities delivers more nuanced and empathetic rulings
- Woman or person from historically oppressed community brings perspective that enriches the law

Affordability:

- Justice is a luxury good
- Cost of competent counsel and incidental expenses price out significant portion of population

Legal Aid Overhaul:

- Transform legal aid into high-calibre institution
- Offer poor comparable quality of representation available to rich
- If state can provide food and education, it must also provide means to defend life and liberty

Geographical Centralisation:

- Litigant from south India travelling to capital for final appeal is unnecessary burden
- Need for Regional Benches or robust system of virtual hearings for Supreme Court

Judicial Independence and Accountability

Independence:

- Judiciary must act as fearless referee
- Hold powerful to account without blinking
- Bedrock of functioning democracy

Accountability:

- Independence not confused with lack of accountability
- Live-streaming of important cases
- Clearer criteria for judicial appointments
- Rebuild 'social contract' with the people

A Systemic Overhaul, Not Incremental Adjustments

National Emergency:

- Stop treating judicial reform as small, incremental adjustments
- Current state is slow-motion catastrophe eroding rule of law

Cultural Shift:

- Move away from adversarial culture (every disagreement as battle to the death)
- Toward culture of resolution

Judges and Profession:

- Judges comfortable with computer screen as with law book
- Legal profession that values closing of case more than prolongation of fee

Way Forward

Immediate:

- Fix firm timelines (1-2 years) for trial commencement or bail under UAPA
- Live-stream important cases
- Implement AI-based case management for routine administrative filing

Medium-Term:

- Establish Regional Benches of Supreme Court
- Overhaul legal aid into high-calibre institution
- Break judicial "old boys' club" through transparent appointment criteria

Long-Term:

- Shift from adversarial culture to resolution culture
- Ensure Bench represents India's diverse tapestry
- Make virtual hearings standard, not exception

Conclusion

With over five crore pending cases, India's justice system has turned into an endurance test where "the process is the punishment." Delays, undertrial detention, and costly litigation demand more than incremental fixes. A real overhaul—combining digital tools, inclusivity, and accountability—is essential. The true test of Viksit Bharat 2047 will be timely justice, not just economic growth.

India-South Korea: A Special Strategic Partnership in the Indo-Pacific

Introduction

The April 2026 state visit of South Korean President to India marked a major boost in ties after eight years. Both countries adopted a Joint Strategic Vision (2026–30) aiming to double trade to $50 billion by 2030.
The partnership now focuses on technology, supply chains, and Indo-Pacific stability amid global disruptions.

Main Body

Strategic & Political Foundations

- **Shared democratic vision & strategic alignment:** India and South Korea see each other as key partners—aligned through Act East Policy and New Southern Policy, with convergence in the Indo-Pacific via Indo-Pacific Oceans Initiative.
- **Stronger institutional engagement:** Annual leader meetings, a new 2+2 dialogue, and expanded parliamentary exchanges deepen structured cooperation.

Economic & Trade Cooperation: The $50 Billion Target

- **CEPA 2.0 for balanced trade:** Upgrade of Comprehensive Economic Partnership Agreement to reduce trade imbalance and expand into digital trade, green economy, and supply chains.
- **New economic & security frameworks:** Industrial Cooperation Committee and Economic Security Dialogue to boost sectors like semiconductors, EV batteries, and ensure resilience in critical minerals and green hydrogen.
- **Digital & financial integration:** Linkage of Unified Payments Interface with Korea's system, plus fintech cooperation for cross-border financial services.

Defence & Technology: Co-Development and Innovation

- **Defence manufacturing boost:** Expansion of K9 Vajra collaboration (L&T–Hanwha) with more tech transfer, and exploration of new air defence and missile systems.
- **Innovation in defence:** Launch of Korea-India Defence Accelerator (KIND-X) to link startups, incubators, and investors.
- **Digital & semiconductor cooperation:** India-Korea Digital Bridge on AI and data, with investment push in semiconductors.

Shipbuilding & Maritime Partnership
Comprehensive Framework:

- A dedicated framework for partnership in shipbuilding, shipping, and maritime logistics was adopted.

- **Greenfield Shipyard:** HD Korea Shipbuilding (HD KSOE) signed a non-binding MoU for joint development of a large greenfield shipyard in Southern India.
- **Ports & Logistics:** MoU on Cooperation in the Ports sector, with ROK aiding in port infrastructure development.

Energy & Resource Security

Joint Statements:

- Separate Joint Statements on **Cooperation in Sustainability** and **Energy Resource Security** were issued.
- **Steel Dialogue:** Annual India-ROK Steel Dialogue launched, focusing on green steel-making. POSCO and JSW signed an MoU for a 6 MMT Integrated Steel Plant in Odisha.
- **Critical Minerals:** Cooperation to strengthen supply chains for strategic resources, critical minerals, and rare earths.

Cultural & People-to-People Ties

Ancient Connect:

- PM Modi invoked the legend of Queen **Heo Hwang-ok** (Princess Suriratna of Ayodhya) who married Korean King Kim Suro in 48 AD, highlighting two millennia of shared heritage.

Modern Cultural Wave:

- President Lee noted that "Bollywood movies and Indian cuisine have become part of everyday culture" in Korea, while K-pop and K-dramas are hugely popular in India.
- **Cultural Exchange Programme (2026-2030):** Signed to promote cooperation in film, animation, and gaming.
- **Friendship Year:** 2028-29 will be commemorated as the "Year of India-ROK Friendship".

Conclusion

The April 2026 summit between India and South Korea reset ties from a buyer-seller model to co-development and strategic trust. With goals like $50B trade, Unified Payments Interface integration, and defence collaboration, the real test lies in effective implementation to deliver economic and Indo-Pacific security gains.

UK's Smoke-Free Generation: A Public Health Landmark

Introduction

The United Kingdom has passed the Tobacco and Vapes Bill, banning tobacco sales for anyone born after January 1, 2009, with the legal age rising annually from 2027—aiming to create a smoke-free generation and reduce smoking by 1.7 million people by 2075.

Main Body

How the Law Works: A Rising Age Floor

The Mechanism:

- Currently illegal to sell tobacco to anyone under 18 in the UK
- From 2027, the legal age for sale will increase by one year every year
- Individuals born since January 1, 2009, will never be able to buy tobacco products legally

Enforcement Focus:

- Law applies only to those who sell tobacco products
- People will not be punished for buying, possessing, or using them, regardless of age

Vaping Restrictions:

- Vaping banned in playgrounds, outside schools, in hospitals, and in cars carrying children
- Smoking cigarettes already banned in these areas
- Vaping still allowed at outdoor venues such as pub gardens
- Vaping outside hospitals allowed to help people trying to quit smoking

Other Provisions:

- Bans vapes and nicotine products (pouches) from being branded and advertised to appeal to children

- UK ministers get new powers to regulate tobacco, vaping, and nicotine products (flavours, packaging)

Public Support: Broad Cross-Party Consensus

YouGov Poll for ASH (2024):

- 78% supported creating a smoke-free generation
- 52% of smokers supported raising the age of sale by one year every year

Cross-Party Support:

- 70% of Conservative voters (2019)
- 74% of Labour voters
- 75% of Lib Dem voters

Smokers' Support:

- Majority of smokers support (more than double the 24% opposed)

Health and Economic Impact: The Case for Prevention

Mortality and Morbidity:

- Smoking responsible for 80,000 deaths a year in the UK
- One in four of all cancer-related deaths
- No other consumer product kills up to two-thirds of its users

Healthcare Burden:

- Almost one hospital admission every minute caused by smoking
- As many as 75,000 GP appointments each month due to smoking-related illnesses

Projected Benefits (ASH):

- Could prevent 115,000 cases of serious illness (stroke, heart disease, lung cancer) annually
- Save billions in health and care costs each year

Fiscal Impact (2023 Data):

- Direct cost of smoking to UK public finances: £21.9 billion ($29.6 billion)
- Includes lost economic productivity, NHS, and social care costs
- More than double the £8.4 billion ($11.3 billion) raised through tobacco tax revenues
- Net drain means less money for vital public services

Criticisms and Unfinished Agenda

Does Not Go Far Enough (Asthma + Lung UK):

- Need new measures to help existing smokers (6 million adults in the UK who already smoke)
- Stop-smoking support currently varies greatly by area—a "postcode lottery"
- Tobacco industry should pay a levy to fund crucial services across the UK

Industry Response:

- Lord Naseby (former Conservative MP): Bill "upsets a great many people in that industry," including retailers. Need proper education, not just prohibition.
- Dan Marchant (Vape Club): Only 25% of UK authorities on track to meet smoke-free 2030 target. Need fact-based education on relative risks between vaping and smoking.

The Risk:

- Without proper support for existing smokers, people may return to smoking
- Prevention alone insufficient without cessation infrastructure

Lessons for India

India's Tobacco Burden:

- Tobacco kills over 1.3 million Indians annually (WHO)
- Leading cause of preventable death and disease
- High burden of oral cancer (gutka, pan masala, khaini)
- Second-hand smoke exposure widespread

Policy Gaps in India:

- Cigarettes and other tobacco products regulated under COTPA (2003)
- Legal age to purchase varies (18 in most states; some states 21)
- No "generation ban" proposal currently under serious consideration
- Enforcement weak; gutka and pan masala bans often circumvented
- Vaping and e-cigarettes completely banned (unlike UK's regulated approach)

What India Can Learn:

- **Intergenerational approach:** A rising age floor eliminates future addiction rather than just restricting access
- **Cross-party consensus:** Tobacco control should be non-partisan
- **Economic argument:** Tobacco costs more to society than it generates in taxes—a powerful fiscal case for reform
- **Cessation infrastructure:** UK's lesson—banning sales to youth is insufficient without supporting existing smokers to quit
- **Industry levy:** Make tobacco industry pay for the harm it causes

Challenges for India:

- Weak enforcement of existing laws (COTPA)
- Powerful tobacco and gutka industry lobby
- Low public awareness of health and fiscal costs
- Federal structure (health is state subject) requires coordinated action

Conclusion

The United Kingdom's Tobacco and Vapes Bill creates a "smoke-free generation" by steadily raising the legal age from 2027, ensuring those born after 2009 never legally buy tobacco—projected to cut illness and deaths, though critics flag gaps for existing smokers.

For India, where tobacco causes over 1.3 million deaths annually, it highlights the need for stronger enforcement, intergenerational prevention, and better cessation support.

AI in Middle School: Feasible, Ethical, and Age-Appropriate?

Introduction

CBSE will introduce a CT–AI curriculum for classes 3–8 from 2026–27, focusing on core skills like abstraction and algorithmic thinking, along with ethics and digital safety. While aligned with global practices, concerns remain about age-appropriate understanding, shift away from rote learning, and risks like anthropomorphising AI.

Main Body

Global Precedents: Aligning with International Frameworks

OECD and European Commission's AI Literacy Framework:

- Identifies CT as a precursor to AI learning
- Recommends CT competencies across age bands beginning from early primary school

AI4K12 Initiative (United States):

- Places CT-related competencies at the base of its "Five Big Ideas in AI"
- CT-competencies progression plan spans K-2, 3-5, 6-8, and 9-12 grade bands

UNESCO Recommendations:

- Identifies topics such as "What is AI?", "Foundations of computing", and "Data literacy" as necessary for school students
- Learners need to cultivate logical thinking from early stages and gradually build problem-solving skills

CBSE's Alignment:

- Sequencing broadly aligns with these comparative curricular architectures

- Designed independently in line with NEP 2020 and National Curriculum Framework for School Education (NCF-SE), 2023

The Feasibility Question: Can Middle Schoolers Engage?

Empirical Evidence (US Middle Schools):

- Learners in the 11-13 age group can engage with AI ideas when supported by structured pedagogical interventions
- Introducing ethical dimensions of AI at this stage is pedagogically feasible

Research on AI in K-12 Education:

- School-age participants as young as 10-12 years can work with fundamental AI concepts
- Introducing concepts such as supervised learning or predictive modelling is viable for learners in 11-14 age group

No-Code Tools:

- Many international initiatives encourage no-code tools for introductory AI learning
- CBSE's expectation that Class 8 students can solve real-world problems using no-code tools is supported by multiple empirical studies

The Verdict:

- CBSE's CT-AI framework appears compatible with learning capacities observed in this age group

Addressing Inherent Risks: Anthropomorphism and Misconceptions

The Risk:

- Children may start attributing human-like traits or capabilities to AI tools that do not actually possess them
- AI systems are pattern-matchers, not thinkers; children may not understand this distinction

CBSE's Response:

- Curriculum contains topics discussing ethical use, fairness, and responsible digital behaviour
- Such discussions can help reduce children's misconceptions about AI
- Modules can support better understanding and prudent use of AI systems

AI4K12 Guidelines (for Comparison):

- Recognising when AI systems may mislead
- Identifying bias in datasets
- Distinguishing between AI and human capabilities across all age groups

The Gap:

- Does CBSE explicitly teach children that AI is not human-like?
- Does it address the "black box" problem (AI systems that cannot explain their reasoning)?

Moving Away from Rote Learning

The Indian Problem:

- Habit of rote learning is deeply entrenched
- Students memorise without understanding; reproduce without reasoning

CT and AI Potential:

- CT and AI learning have the potential to encourage inquiry-driven, reflective learning
- Emphasises practical modelling, reflection, and ethical reasoning
- Can contribute to ongoing efforts to move classroom practices away from rote-based methods

Cross-Disciplinary Design:

- CBSE curriculum follows cross-disciplinary design by integrating CT into Mathematics and 'The World Around Us' course for Classes 3-5
- Global experiences with cross-disciplinary instructional models reported improvements in students' reasoning and problem-solving

The Challenge:

- Curriculum design alone cannot change rote culture
- Teacher training, assessment reform, and classroom practices must align

Way Forward: Recommendations

Teacher Training:

- National mission for teacher upskilling in CT and AI
- Pre-service and in-service training modules
- Certification pathways for AI literacy educators

Infrastructure:

- Bridge digital divide (devices, internet, electricity in schools)
- No-code tools pre-installed and tested
- Offline alternatives for schools without reliable connectivity

Assessment Reform:

- Move away from rote-based examinations
- Project-based assessment (build, test, reflect)
- Portfolios and peer review, not just pen-and-paper tests

Curriculum Support:

- Develop age-appropriate local examples (Indian contexts, not just Western)
- Explicit modules on AI anthropomorphism (AI is not human)
- Parental awareness campaigns to reinforce learning at home

Pilot and Scale:

- Pilot in select schools before nationwide rollout
- Gather Indian empirical evidence on learning outcomes
- Iterate based on classroom feedback

Conclusion

CBSE's CT-AI curriculum for classes 3–8 aligns with global frameworks and National Education Policy 2020, and can foster early AI literacy and ethical awareness through activity-based learning. However, its success hinges on robust teacher training, adequate infrastructure, and assessment reforms. Without these, and without addressing risks like anthropomorphising AI, it may remain a token addition rather than transforming rote-based learning.

Chabahar Crossroads: US Sanctions and India's Strategic Autonomy

Introduction

The lapse of the US waiver on Chabahar places India at a strategic crossroads. The port—key to accessing Afghanistan and Central Asia while bypassing Pakistan—has long been central to India's connectivity and geopolitical strategy.

With growing US pressure and regional instability, India risks losing not just a $620 million investment but also strategic space. Yielding would weaken its independent foreign policy, making Chabahar a test case for India's strategic autonomy in an increasingly multipolar world.

Main Body

Chabahar: A Brief History of Start-Stop Engagement

Early Efforts (Vajpayee Era):

- 2003: PM A.B. Vajpayee signed MoU for Chabahar port development
- However, US pressure to postpone plans (aimed at stopping Iran's nuclear programme) led to construction delays

Manmohan Singh Era:

- Unable to make much progress on Chabahar
- Continued work on Zaranj-Delaram highway (connecting Iran-Afghanistan border to Kabul)

Modi Era (Pre-Trump):

- 2015: After JCPOA (Iran nuclear deal), Modi government signed trilateral agreement with Iran and Afghanistan
- Aim: Advance trade and aid via Chabahar port and highway into Afghanistan
- Chabahar's importance grew as ties with Pakistan deteriorated (Pakistan restricted India's transit access to Afghanistan)

Trump's "Maximum Pressure" Campaign:

- Trump walked out of JCPOA
- Re-implemented all sanctions on Iran
- India forced to give up Iranian oil imports and plans for rail line
- However, US built a "carve-out" for Chabahar, allowing India to send wheat and medical supplies to Afghanistan

The Current Crisis:

- Trump administration gave India until April 2026 to "wind-down" operations
- Since November 2025, India has:
  - Withdrawn personnel from Chabahar
  - Prepaid its $120 million investment commitment
  - Considering transferring its stake to an Iranian company (with option to return later)

Beyond Chabahar: A Pattern of US Diktats

Other Instances of US Pressure on India:

- Stop buying oil from Iran (forced compliance)
- Stop buying oil from Venezuela (forced compliance)
- Stop buying oil from Russia (partial compliance; India continues but under pressure)
- Threats of sanctions on all trade with Iran
- Threats of sanctions on BRICS grouping members

The Escalating Demand:

- US's "seemingly insatiable demands" may extend to India's engagement with other countries
- What is the limit? Where does India draw the line?

The Chabahar Carve-Out (Now Lapsed):

- Was a pragmatic exception allowing India to maintain connectivity to Afghanistan
- Its lapse signals a hardening of US position
- No indication of renewal

Strategic Importance of Chabahar for India

Connectivity Hub:

- Gateway to Afghanistan and Central Asia (bypassing Pakistan)
- Alternative to China's Gwadar port (80 km away in Pakistan)
- Key to International North-South Transport Corridor (INSTC) connecting India to Russia and Europe via Iran

Counter to China's BRI:

- Gwadar is part of China's Belt and Road Initiative (BRI)
- Chabahar is India's strategic counterweight in the region

Afghanistan Access:

- Pakistan restricted India's transit access to Afghanistan
- Chabahar provided a direct route for trade and aid (wheat, medical supplies, development assistance)

Investment at Stake:

- $620 million already invested
- Additional $120 million prepaid commitment

- Transferring stake to Iranian company means loss of operational control

The West Asia War: Further Complications

Uncertain Timeline:

- Unclear when (or if) India will be able to re-engage with Iran
- Post-conflict reconstruction of Chabahar may be delayed by years

Risk of Escalation:

- If war widens, even a transferred stake may become subject to secondary sanctions
- India's ability to "return later" depends on geopolitical stability

The Pragmatic Temptation:

- Temporarily dropping the project may seem prudent
- Preserves optionality while avoiding immediate sanctions risk

The Larger Question: Strategic Autonomy vs. US Alignment

India's Claim:

- "Strategic autonomy" has been a cornerstone of India's foreign policy since the Cold War (Non-Aligned Movement)
- Ability to pursue independent decisions based on national interest

The Reality:

- US has systematically sliced away India's independent choices
- On oil imports (Iran, Venezuela, Russia): India complied
- On Chabahar: India is complying
- On BRICS: US has threatened sanctions; India's response is uncertain

The Slippery Slope:

- Giving in on Chabahar will embolden US to demand more
- Next: restrictions on defence ties with Russia? (India's S-400 systems already under CAATSA threat)
- Next: restrictions on trade with China?
- Next: restrictions on BRICS cooperation?

The Cost of Compliance:

- Loss of sovereign autonomy
- Damage to credibility among other partners (Iran, Russia, Central Asian countries)
- Incentive for China to expand BRI footprint (Gwadar) without Indian competition

Way Forward: Options for India

Option 1: Full Compliance (Current Trajectory)

- Transfer stake to Iranian company
- Withdraw personnel and equipment
- Accept that Chabahar is dead until geopolitics changes
- **Risk:** Sets precedent for US diktats on other issues

Option 2: Risk Sanctions (Proceed Anyway)

- Maintain stake and continue operations
- Risk strict US sanctions (secondary sanctions on Indian entities, banks)
- **Risk:** Financial and trade isolation; potential CAATSA triggers

Option 3: Hedge (Delay and Diversify)

- Transfer operational control but maintain legal ownership
- Keep option to return after conflict or regime change in US
- Diversify connectivity options: INSTC via Bandar Abbas, Chabahar's alternative?
- **Risk:** Iran may not accept "half-in" arrangement

Option 4: Negotiate a New Carve-Out

- Argue that Chabahar is essential for post-conflict Afghanistan reconstruction
- Tie to US interest in regional stability
- **Risk:** US has shown no flexibility in current sanctions regime

Long-Term Strategy:

- Strengthen rupee-rial trade mechanisms to bypass dollar-based sanctions
- Build strategic petroleum reserves to reduce import vulnerability
- Diversify connectivity partnerships (Central Asia via INSTC, Bay of Bengal initiatives)
- Accept that strategic autonomy requires paying a price; choose which battles to fight

Conclusion

The lapse of the US waiver on Chabahar reflects a broader pattern of external pressure on India's strategic choices. Chabahar is vital as India's gateway to Afghanistan and Central Asia, bypassing Pakistan and countering China's regional footprint. Yielding to pressure risks undermining connectivity and strategic autonomy. India must negotiate a fresh carve-out, diversify routes, and accept trade-offs—because the real challenge is defining its foreign policy space in a multipolar world.

Mission Poshan 2.0: Strengthening India's Nutrition Ecosystem

Introduction

Launched in 2018, **POSHAN Abhiyaan** shifted nutrition from welfare to a human capital priority. In 2021, it was subsumed under **Mission Poshan 2.0**, integrating key schemes. With a lifecycle focus on the first 1,000 days, it operates through three pillars: nutrition support, ECCE, and Anganwadi infrastructure.

Main Body

Policy Evolution: From ICDS to Mission Poshan 2.0

Foundational Platforms:

- **ICDS (1975):** Provided foundational platform for supplementary nutrition and early childhood care through Anganwadi Centres
- **PMMVY (2017):** Maternity benefits through direct cash transfers for pregnant and lactating mothers
- **NITI Aayog National Nutrition Strategy (2017):** Emphasised convergence, improved monitoring, and mission-mode approach

POSHAN Abhiyaan (2018):

- Multi-ministerial mission bringing over 26 ministries under unified framework
- Time-bound targets, digital monitoring, Jan Andolan approach

Mission Poshan 2.0 (2021-22):

- Consolidated fragmented schemes into unified integrated framework
- Sharpened focus on maternal nutrition, IYCF norms, and treatment of SAM/MAM
- Emphasised wellness through AYUSH-based practices

Three Primary Verticals of Mission Poshan 2.0

(i) Nutrition Support:

- Supplementary Nutrition for children (6 months to 6 years), pregnant women, lactating mothers, and adolescent girls
- Revised norms (January 2023): Shift from calorie-specific to comprehensive diet diversity principles (quality protein, healthy fats, micronutrients like Calcium, Zinc, Iron, Folate, Vitamins B6 and B12)
- Extra nutrition for SAM children under NFSA
- Poshan Vatikas (Nutri-gardens) at Anganwadi Centres, schools, and Gram Panchayat lands for diet diversity
- Protocol for Management of Malnutrition (jointly with MoHFW): Growth monitoring, referral to Nutrition Rehabilitation Centres (NRCs), home-based management for children without medical complications

(ii) Early Childhood Care and Education (ECCE) Integration:

- **National ECCE Policy (2013)** and **NEP 2020** framework: 5+3+3+4 structure with 5-year Foundational Stage (3 years preschool/Anganwadi + Classes 1-2)
- **Poshan Bhi Padhai Bhi (PBPB):** Improving ECCE quality through Anganwadi system
- **Capacity building:** 41,645 State Level Master Trainers and 10,58,317 Anganwadi Workers trained as of March 2026
- **Navchetana (0-3 years):** National Framework for Early Childhood Stimulation; 140 age-appropriate activities based on "Serve and return," "Love, Talk, Play," and positive guidance
- **Aadharshila (3-6 years):** National Curriculum for ECCE; 130+ activities based on NEP 2020's 5+1 domains of development
- **Vidyarambh Certificate:** ECCE certificate for children transitioning to formal schooling; over 22 lakh certificates issued
- **Co-location Guidelines (September 2025):** Anganwadi Centres within Government Primary Schools; over 2.9 lakh centres integrated
- **Home Visit Scheduler (April 2026):** IT-enabled system supporting 23 structured home visits from pregnancy to 3 years

(iii) Saksham Upgradation:

- Upgradation of existing Anganwadi Centres with modern amenities
- 2 lakh centres sanctioned for strengthening with LED screens, water purifiers, smart learning aids, and Poshan Vatikas

Technology and Governance Transformation: Poshan Tracker

Scale (as of March 2026):

- Nearly 14,03,170 Anganwadi Centres monitored
- Approximately 8,95,29,425 eligible beneficiaries tracked (pregnant women, lactating mothers, children up to 6 years, adolescent girls)

Key Features:

- Near real-time data collection for Anganwadi Services (centre opening, daily attendance, ECCE activities, growth monitoring)
- Facial Recognition System (FRS) for last-mile tracking and beneficiary verification
- Aadhaar-based tracking to prevent leakages and eliminate ghost entries
- Home Visit Scheduler with auto-scheduling and age-appropriate counselling videos

Recognition: Prime Minister's Award for Excellence in Public Administration 2024

Grievance Redressal:

- Poshan Helpline (1515) available in 17 languages for beneficiary concerns

Community Engagement: Nutrition as Jan Andolan

Poshan Pakhwada (8th edition: April 9-23, 2026):

- Theme: "Maximizing Brain Development in the First Six Years of Life"
- Key focus areas: Mother and child nutrition, early stimulation for brain development, play-based education, minimizing screen time, community support for Anganwadi

Rashtriya Poshan Maah (September annually):

- 8th Poshan Maah launched by Prime Minister on September 17, 2025 from Dhar, Madhya Pradesh
- Jointly implemented with MoHFW under Swasth Nari, Sashakt Parivar Abhiyaan

Cumulative Impact:

- Over 150 crore activities generated through Poshan Maah and Poshan Pakhwada
- Nationwide community mobilisation through Gram Panchayats, Urban Local Bodies, schools, health facilities, and Anganwadi Centres

Conclusion

Mission Poshan 2.0 marks a shift from calorie support to lifecycle-based nutrition and human capital development. It integrates schemes, leverages the **Poshan Tracker**, and drives community action via **Jan Andolan**. Linking ECCE with **National Education Policy 2020** through Navchetana and Aadharshila strengthens early learning. Sustained focus is key for a healthy workforce by 2047.

Viksit Bharat Shiksha Adhisthan (VBSA) Bill

Introduction

The Viksit Bharat Shiksha Adhisthan (VBSA) Bill seeks to statutorily implement NEP 2020, which was adopted without State consultation. Critics call it a constitutional overreach. Entry 66 of the Union List gives Parliament limited power only for coordination and determination of standards in higher education. Yet the Bill gives Union-controlled councils sole discretionary power over standards, inspections, funding, and closures—undermining federalism and institutional autonomy.

Main Body

Constitutional Concerns

- **Entry 66, Union List:** Parliament's power limited to coordination and standards—not complete takeover
- **Concurrent List:** Education is a shared responsibility, but Bill centralises power
- **Autonomy eroded:** IITs, IIMs, State universities lose governing body powers
- **Bureaucratic overreach:** No participation of HEIs or academics in decision-making

What the Bill Does Not Do

- No enforcement of affirmative action for SCs, STs, and OBCs
- No provision for inter-institutional, inter-State, or inter-regional justice
- Pushes higher education dependence on loans over public funding
- Undermines multicultural character of Indian knowledge in name of "Bhartiya Knowledge"

The Alternative Proposal: Role of State Higher Education Councils (SHECs)

- SHECs should be represented on all three councils under the Bill
- 50% weightage each to SHECs and Union councils in regulation, accreditation, and standards
- No institution should be closed without consent of the concerned State government
- Standards should be shaped State-wise and sector-wise, not top-down from Delhi

Three Councils: Critique and Alternatives

- **Regulatory Council (Viniyaman Parishad):** Should not have free hand over closures; State consent required
- **Accreditation Council (Gunvatta Parishad):** Technology-driven assessment cannot replace deliberative, process-oriented evaluation
- **Standards Council (Manak Parishad):** Sitting in Delhi cannot define uniform standards for diverse State priorities

Separate Higher Education Grants Council (HEGC)

- Disburse funds for integration of teaching, research, and outreach
- Provide generous funding to laggard State institutions to bridge historical discrimination
- SHECs should be duly funded by HEGC

Evaluation Framework

- Shift from output-based (patents, publications) to outcome- and impact-centric evaluation
- Focus on learning levels, employability, and social justice outcomes

Conclusion

The VBSA Bill centralises higher education regulation in ways that may violate the Concurrent List status of education and Entry 66 of the Union List. States are the primary financiers of their higher education systems, yet the Bill gives them no role in regulation, accreditation, or standards.

The alternative proposal—50% weightage to State Higher Education Councils, State consent for closures, and a separate funding mechanism for laggard institutions—offers a cooperative federal path forward. The JPC must amend the Bill to balance Centre-State responsibilities.

PAPER 3

Industrial Accidents: Creeping Risks and Regulatory Gaps

Introduction

The boiler explosion in Sakti, which killed 20 people, reflects systemic safety failures rather than sudden malfunction. Like the Visakhapatnam gas leak and Neyveli thermal power station blast, it points to inactive safety systems, unstable restarts, and poor risk monitoring.

India's regulatory focus on fabrication and self-certification—rather than continuous instrumentation and real-time audits—leaves critical gaps. With ageing infrastructure and vulnerable contract labour, industrial "accidents" can no longer be treated as routine costs of growth.

Main Body

The Engineering Reality: Risks That Build Over Time

Boiler Failure Causes:

- Overpressure
- Scaling (deposit buildup on internal surfaces)
- Mismanaged water level
- Revival stress (during restart after shutdown)

Key Insight: Boilers almost never fail suddenly. Risks accumulate over time.

Common Thread in Recent Disasters:

- Sakti (Chhattisgarh): Recently acquired, recently commissioned, operating below full capacity
- Visakhapatnam (2020): Safety systems inactive or uncalibrated after post-lockdown restart
- Neyveli (2020): Plant restart process triggered explosion

Unstable Operating Regimes:

- Failures result from transient thermal and pressure imbalances
- Yet neither national boiler inspection nor regulatory framework heightens oversight during these phases

Regulatory Framework: Flaws and Gaps

Certification Validity:

- Valid for up to one year
- But boiler conditions vary on a daily basis

Perverse Incentives:

- Current structure penalises downtime (lost production)
- Does not penalise unsafe operations
- Does not reward maintenance shutdowns

Focus on Fabrication, Not Continuous Monitoring:

- Framework focuses on fabrication standards (how boiler was built)
- Neglects continuous instrumentation and auditing (how boiler is operated)

'Ease of Doing Business' Consequences:

- Self-certification favoured over government inspection
- Scheduled third-party audits replace surprise inspections

New Rules:

- Boiler Accident Inquiry Rules notified in 2025
- Whether they address structural gaps remains to be seen

Expanding Industrial Capacity, Ageing Infrastructure

The Pressure Builds:

- Industrial capacity expanding rapidly
- Ageing infrastructure pushed harder
- More plants operating closer to their limits

Flaws Exposed:

- Management failures now receive more media coverage and political attention
- But hazards likely existed for years
- Crises are not altogether accidental—they are the result of accumulated neglect

Labour Vulnerability: Contract Workers Most Exposed

Who Is at Risk:

- Growing share of workers are migrants hired via subcontractors
- Contract labour most exposed to hazardous conditions

The Blame Game:

- Operator and subcontractor trade blame after a disaster
- No clear accountability

Language Barriers:

- Safety signage and manuals often unavailable in workers' native languages
- Investigators report workers in Pune industrial belt (since 2021), Sangareddy (2024, 2025) unaware of names and properties of chemicals in their workplace

The OSHW Code 2020 Gap:

- Occupational Safety, Health and Working Conditions Code, 2020
- Does not clearly hold principal employer criminally liable for safety lapses in contractors' operations
- Qualifies liability on employer's negligence (high burden of proof)

The Culture of Absorbing 'Accidents'

Old Complaints:

- These are old complaints about how India treats its labour
- Workers bear the risk; firms bear the profit

What Must Change:

- Firms' incentives (downtime penalised, unsafe operation not penalised)
- Regulators' incentives (self-certification over inspection)
- Labour arrangements (contractor-worker-operator triangle of blame)
- Factory-floor practices (safety signage in native languages, chemical awareness)

The Cost of Doing Business:

- Until this culture is dismantled, 'accidents' will continue to be absorbed as cost of doing business

Way Forward

For Regulators:

- Shift focus from fabrication standards to continuous instrumentation and auditing
- Replace self-certification with surprise government inspections
- Restructure incentives: penalise unsafe operations, reward maintenance shutdowns
- Evaluate and strengthen Boiler Accident Inquiry Rules, 2025

For Firms:

- Implement real-time boiler condition monitoring
- Ensure safety signage and manuals in workers' native languages

- Train contract workers on chemical names, properties, and hazards

For Legislation:

- Amend OSHW Code 2020 to hold principal employer criminally liable for safety lapses in contractors' operations
- Remove the 'negligence' qualification (high burden of proof)

For Labour Protection:

- Ban contract labour arrangements that diffuse accountability
- Ensure direct employer liability regardless of subcontracting

Conclusion

The boiler explosion in Sakti, killing 20, reflects accumulated risks—overpressure, scaling, poor water management, and unsafe restarts—compounded by weak regulation. Annual certification, self-certification, and poor monitoring create perverse incentives where downtime is punished but unsafe operations persist. Contract labour remains most vulnerable, with limited accountability under the Occupational Safety, Health and Working Conditions Code. These are not accidents but predictable outcomes of systemic neglect—without reform, another Sakti is inevitable.

Pyrotechnic Disasters: Faith, Safety, and the Regulatory Vacuum

Introduction

The Mundathikode explosion, following incidents like the Puttingal temple fireworks disaster, exposes persistent lapses in enforcing safety norms in India's pyrotechnic sector. Despite past judicial warnings, regulatory complacency—often driven by festival pressures and vote-bank politics—continues to put lives at risk.

Main Body

Background: Legal Framework and Institutional Failures

Key Regulatory Framework:

- **Explosives Act, 1884** and **Explosives Rules, 2008**: Govern manufacture, storage, and transport of explosives
- **Petroleum and Explosives Safety Organization (PESO)** : Licensing authority for fireworks units
- **Judicial Commission after Puttingal Temple Fire (2016)** : Recommended strict norms on licensing, materials, layout, and conduct of displays

The Gap:

- Despite stringent recommendations, compliance has been woefully inadequate
- Eyewitness accounts at Mundathikode suggest:
  - No safe distance between sheds storing gunpowder and abrasion-sensitive chemicals
  - Stockpiling of excess quantities of flash powder
  - Lack of safety gear and firefighting equipment
  - Employment of untrained workers
  - Likely use of banned chemicals
  - Lax enforcement by local authorities

The Puttingal Precedent (2016):

- Over 100 deaths; triggered judicial commission
- Established template for safety: licensing, storage limits, distance norms, worker training
- Yet, within a decade, the same lessons have been forgotten

Multidimensional Challenges

Political Dimension:

- Religious festivals such as Thrissur Pooram entangled in vote-bank politics
- Authorities hesitant to enforce safety measures around fireworks displays and elephant parades

- 'Loudness' often defines success of competitive fireworks displays
- Attempts to do away with high-decibel fireworks (citing safety of patients, pregnant women, infants) find no popular support

Social Dimension:

- Faith-based resistance to safety interventions
- Public perception that safety measures dampen "spirit" of festivals
- Lack of awareness about risks among workers and general public
- Informal workforce in pyrotechnic industry (no training, no safety gear, no insurance)

Economic Dimension:

- Pyrotechnic industry employs thousands, mostly in unorganised sector
- Small-scale units operate on thin margins; safety investment is low priority
- Cost of compliance (safe storage, firefighting equipment, worker training) seen as avoidable expense

Administrative Dimension:

- Weak enforcement by local authorities (police, revenue, PESO)
- Coordination gaps between multiple regulators (PESO, State Pollution Control Board, labour department, local self-government)
- Absence of regular inspections; inspections often pre-announced
- No penal action against violators; fines too low to deter

Ethical Dimension:

- Sacrificing safety at the altar of faith raises fundamental ethical questions
- Right to life (Article 21) vs. right to religious freedom (Article 25)
- State's duty to protect citizens from foreseeable harm
- Exploitation of untrained workers without safety gear

Way Forward: Practical Solutions

Regulatory Reforms:

- **Single-window clearance** for temporary fireworks display units during festival season
- **Mandatory pre-festival safety audit** by independent agency (not PESO alone)
- **Strict licensing for temporary storage** with time-bound validity (no indefinite storage)
- **Penalties** for violations: suspension of licence, prosecution of organisers, recovery of compensation costs

Technological Integration:

- **Cold spark technology** (low-temperature, low-risk) as alternative to traditional pyrotechnics
- **GPS tracking of explosive transport** to prevent diversion and illegal stockpiling
- **Real-time monitoring of storage sheds** using IoT sensors (temperature, humidity, abrasion)

Capacity Building:

- **Mandatory training and certification** for all pyrotechnic workers (including temporary)
- **First-aid and firefighting drills** before every festival season
- **Public awareness campaigns** on risks of fireworks, especially for patients, pregnant women, and infants

Institutional Reforms:

- **Empower local bodies** (panchayats, municipalities) to deny permits if safety norms not met
- **District-level disaster management authorities** to coordinate with PESO, police, and fire services
- **Judicial monitoring committee** in each district for high-risk festivals (model: Pune's Ganesh festival safety committee)

Role of Civil Society:

- **Community-based monitoring** of fireworks storage and display
- **Whistleblower mechanisms** for reporting unsafe practices (with protection)
- **Faith-based safety campaigns** (temple committees, mosque committees, church councils) to self-regulate

Lessons from Global Models:

- **Japan:** Fireworks displays regulated by strict licensing, mandatory insurance, and independent safety auditors
- **United States (NFPA 1123):** Code for fireworks displays; requires distance calculations, fall-out zones, and qualified operators
- **European Union (Pyrotechnic Articles Directive, 2013):** Mandates CE marking, conformity assessment, and traceability

Conclusion

The Mundathikode tragedy, like the Puttingal temple fireworks disaster and the Virudhunagar blast, reflects a cycle of neglect without reform. The right to life under Article 21 of the Indian Constitution must prevail over religious freedom under Article 25 of the Indian Constitution. India needs a national safety code, strict certification, real-time monitoring, and firm enforcement—because faith cannot come at the cost of human lives.

West Asia Crisis: Fallout on India's Economy

Introduction

The West Asia war has disrupted energy supplies and trade routes, with lingering impacts despite easing prices.

For import-dependent India, shocks transmit across inflation, growth, CAD, and fiscal stability—leaving no easy solutions.

Main Body

Energy Dependence and Price Shocks

India's Import Dependence:

- Crude oil imports from 41 source countries
- Dependence close to 90% and rising
- Indian crude basket (Brent + Oman/Dubai) linked to global prices

Price Trajectory:

- Indian crude basket in March 2026 was 19% higher than global crude price
- Rose over 64.5% from February 2026 on average
- Peaked at $157 per barrel on March 23, 2026
- Came down to $120.28 per barrel on April 9, 2026 (post-ceasefire)

Seven Channels of Economic Impact

Supply Disruptions:

- Energy-intensive sectors affected first: textiles, paints, chemicals, fertilisers, cement, tyres
- Non-availability of fertilisers and chemicals will hit Kharif season agricultural output (starting June)

Logistics Costs:

- Storage and transport are highly energy intensive
- Increased logistics costs cascade into prices of all final products

Exports:

- Share of India's merchandise exports to West Asia: 16.4% (2024-25)
- Demand side hit by slowdown in US and Europe as well
- Rupee depreciation may partially help exporters

Exchange Rate and Remittances:

- Rupee depreciation accelerated after the crisis
- Additional dollar demand for energy and fertiliser imports
- Remittances from Gulf countries (considerable volume) bound to decline
- Net FPI outflows in March 2026: $13.6 billion (huge)

Current Account Deficit (CAD):

- Export volumes fall; import values rise
- CAD will increase if war continues

Inflation:

- Cost-push inflation in directly affected sectors (petroleum products, fertilisers)
- If liquidity also increases, pressure on overall inflation

Fiscal Deficit:

- Government insists on keeping retail prices at present levels
- Reduction in excise duty on petrol/diesel → direct revenue loss
- Lower GDP growth and profit margins → lower tax revenues
- State finances affected through lower tax devolution

Excise Duty Conundrum

The Math (as of March 27, 2026):

- Fortnightly loss on lower excise duties on petrol and diesel: ₹7,000 crore
- Gain from export tax on Aviation Turbine Fuel: ₹1,500 crore per fortnight
- Net loss: ₹5,500 crore per fortnight
- Annualised loss if crisis continues: approximately ₹1,32,000 crore

The Dilemma:

- Current excise reduction is due to ongoing State elections
- After elections, retail prices should go up if war resumes
- Higher prices may constrain demand—desirable from inflation perspective

RBI Estimates (October 2025 Monetary Policy Report)

For every 10% increase in Indian crude basket from $70 baseline ($7 increase):

- Real GDP growth may fall by around 15 basis points
- Inflation would be higher by 30 basis points (assuming full pass-through)

Policy Responses Needed

Short-Term:

- Allow retail prices to go up as long as crude prices remain high
- Avoid large liquidity increases (would fuel inflation)
- Monitor fertiliser availability for Kharif season

Medium-Term:

- Continue diversifying crude oil sources (41 already)
- Build strategic petroleum reserves
- Rethink fertiliser subsidy regime that promotes imbalanced nutrient use

Long-Term:

- Reduce import dependence through renewables, nuclear, and storage
- Build fiscal buffers for future shocks

Conclusion

The West Asia crisis exposes India's vulnerability due to high oil import dependence, impacting inflation, growth, CAD, and fiscal stability. Short-term measures are costly and reactive; durable resilience requires diversification, buffers, reforms, and market-linked pricing.

Food Prices and Oil Shocks: The Fertiliser-Food Nexus

Current Context

The ongoing West Asia conflict (Feb-April 2026) has effectively closed the **Strait of Hormuz**, disrupting global energy and fertiliser supplies. While global food prices remain stable for now, experts warn that the **energy shock is transmitting through fertilisers**, threatening future harvests and food inflation.

The Critical Transmission Channel: Fertilisers

Unlike past oil shocks, the current crisis has not yet caused a food price spike—the FAO Food Price Index for March 2026 is only 1% higher year-on-year. However, this masks a deeper vulnerability:

- **Urea (nitrogen fertiliser):** 30-34% of global urea trade passes through the Strait of Hormuz; supplies are severely restricted
- **Phosphate fertilisers:** Saudi Arabia produces about 20% of global supply; region exports over 40% of sulphur (key ingredient)
- **Prices rising:** Urea and DAP prices up 20% since conflict began; sulphur and ammonia shipments blocked

India's Exposure

India is acutely vulnerable across multiple dimensions:

Commodity	Import Dependence	West Asia Share
Crude oil	80-90%	~55%
LPG	~62%	Over 90%
DAP (fertiliser)	50-60%	~30% of total imports
MOP (potash)	100%	Significant

- **Effective fertiliser import reliance (including feedstocks):** ~69% (ICRIER estimate)
- **Domestic gas shortage:** Plants shutting as gas diverted to households, reducing local fertiliser output

Impact Pathways

Direct Channels:

1. **Higher fertiliser prices** → increased subsidy burden (Ukraine war saw subsidy bill balloon 2.5x budget)
2. **Supply delays** → reduced yields → lower harvests → higher food prices later
3. **Edible oils:** Vegetable oil sub-index up 13.2% (biofuel linkage; Indonesia launching B50)

Indirect Channels (Moody's/FinMin analysis):

- Higher transport costs (fuel pass-through)
- Logistics disruptions (rerouting via Cape of Good Hope adds 6,000-10,000 nautical miles)
- Remittance vulnerability (Gulf accounts for ~40% of India's remittances)

India's Buffers (Temporary)

- **Rice stocks:** 12 times buffer norm
- **Wheat stocks:** Nearly double buffer norm
- **Fertiliser inventory:** ~18 million tonnes (~2 months consumption)

Risks Ahead

Critical concern: The shock comes just as Northern Hemisphere planting season begins. "In the worst case, this means lower yields and crop failures next season," warned World Food Programme's Carl Skau.

Potential double-hit: If conflict persists and an **El Niño** follows, India could face a repeat of 2022-23 when cereal inflation stayed above 10% for over a year.

Economic Impact Summary (FY27 projections):

- Moody's: GDP growth cut to 6% (from 6.8%); inflation at 4.8%
- EY: GDP erosion of ~1 percentage point; inflation +1.5 percentage points
- ICRA: WPI inflation at 21-month high of 3.2% in March 2026

Policy Implications

Government measures taken:

- Exploring alternatives from Indonesia, Belarus, Morocco, China
- Approved new fertiliser types to shift toward alternatives
- Daily meetings with farmers to restrain excessive urea usage

Recommendations:

- Proactive management of stocks and supplies
- Keep import window open
- Prepare for extended uncertainty

NSO 80th Round Survey: Healthcare Access Improves, Out-of-Pocket Expenditure Declines

Why in News?

- **National Statistical Office (NSO)** released findings of its **80th round survey** on household social consumption related to health
- Survey canvassed **1,39,732 households** (over 76,000 rural + over 63,000 urban) across India
- Highlights significant progress in **healthcare access, affordability, and utilisation**

Key Findings: Out-of-Pocket Expenditure (OOPE)

Average OOPE for Outpatient Care in Public Health Facilities

- **Zero** – underscores widespread access to free essential healthcare services

Hospitalisation Expenditure (2025)

- **Median OOPE per hospitalisation case:** over ₹11,000
- More than **half of patients** in government facilities incurred OOPE of **less than ₹1,100**
- **Average medical expenditure per hospitalisation:** ₹11,285

Key Findings: Health-Seeking Behaviour

Projected Population Reporting Ailments (PPRA) – Nearly Doubled

- Rural areas: **6.8% (2017-18)** → **12.2% (2025)** (increase of 5.4 percentage points)
- Urban areas: **9.1% (2017-18)** → **14.9% (2025)** (increase of 5.8 percentage points)
- Reflects **improved awareness and willingness to seek care**

Key Findings: Utilisation of Public Health Facilities (Outpatient Care)

- Rural population using public facilities for outpatient care:
  - 2014: 28%
  - 2025: 35%
  - Increase of **7 percentage points**
- Driven by **expansion of primary healthcare services** (Ayushman Bharat Health and Wellness Centres)

Key Findings: Health Insurance Coverage (Government-Funded Schemes)

Coverage including Ayushman Bharat – Pradhan Mantri Jan Arogya Yojana (PM-JAY)

- Rural areas: **12.9%** → **45.5%** (increase of 32.6 percentage points)
- Urban areas: **8.9%** → **31.8%** (increase of 22.9 percentage points)
- Significant **increase across both rural and urban areas**

Key Findings: Maternal Healthcare

Institutional Deliveries

- Rural areas: **90.5% (2017-18)** → **95.6% (2025)**
- Urban areas: **96.1% (2017-18)** → **97.8% (2025)**
- Reflects **better access to healthcare services** and impact of schemes like Janani Suraksha Yojana (JSY)

Key Findings: Epidemiological Transition

- **Decline in infectious diseases**
- **Rising prevalence of non-communicable diseases (NCDs)** such as:
  - Diabetes
  - Cardiovascular conditions
- Reflects India's ongoing **epidemiological transition** – shift from communicable to non-communicable diseases as primary health burden

Reasons for Improvement (Ministry of Health and Family Welfare)

- **Sustained increase in public investment** in health sector
- Enhanced budgetary allocations enabling:
  - Expansion of healthcare infrastructure (primary, secondary, tertiary levels)
  - Strengthened human resources
  - Scaling up of key initiatives focused on **preventive, promotive, and curative care**
- **Targeted government interventions**
- **Increased insurance coverage** (including PM-JAY)

About the Survey

Survey Details

- **Round:** 80th round of NSO survey (National Sample Survey – NSS)
- **Topic:** Household social consumption – health
- **Sample size:** 1,39,732 households (rural + urban)
- **Reference period:** 2025
- **Conducted by:** National Statistical Office (NSO), Ministry of Statistics and Programme Implementation (MoSPI)

Coverage

- Over 76,000 households in rural areas
- Over 63,000 households in urban areas
- Provides **robust, ground-level insights** into healthcare access, affordability, and utilisation patterns

Chernobyl at 40: Lessons for Nuclear Safety and India's Energy Future

Introduction

On April 30, 1986, news broke that the Chernobyl disaster had spread radiation across Europe, forcing the Soviet Union to seek Western help. Four decades on, it remains the worst nuclear accident, underscoring enduring lessons on reactor design, safety culture, regulatory independence, and transparent communication—vital as India expands nuclear power.

Main Body

The Chernobyl Disaster: What Happened

The Incident (April 26, 1986):

- Explosion and fire at Reactor No. 4 of the Chernobyl Nuclear Power Plant
- Located near Pripyat, 50 km north of Kiev, Ukraine (then Soviet Union)
- Caused by a flawed reactor design (RBMK-1000) and inadequately trained personnel

The Cause:

- Safety test went wrong due to design flaws and operator error
- Reactor core melted, causing a steam explosion and fire
- Graphite moderator caught fire, releasing radioactive material for 10 days

The Immediate Aftermath:

- Soviet Union initially denied any accident
- Radiation detected in Sweden (April 28), 1,600 km away
- Only then did Moscow acknowledge the disaster
- Soviet Union turned to West Germany and Sweden for technical advice

The Human and Environmental Toll:

- 31 direct deaths (reactor staff and emergency workers)
- Thousands of thyroid cancer cases (especially children)
- 350,000 people evacuated from a 30-km exclusion zone (still largely uninhabitable)
- Radioactive contamination across Europe

The Radiation Cloud: Transboundary Impact

Geographic Spread:

- Radiation cloud reached Finland, Denmark, and Sweden within 48 hours
- Detected across Western Europe
- Intensity capable of affecting thousands even 150 miles from plant

International Reaction:

- Nordic countries detected elevated radiation and demanded explanation
- Soviet Union's initial denial eroded trust
- Demonstrated that nuclear accidents do not respect national borders

The Lesson:

- Any nuclear accident has transboundary consequences
- Transparency and early notification are not optional—they are obligations under international law (IAEA Convention on Early Notification of a Nuclear Accident, 1986, adopted after Chernobyl)

Safety Lessons from Chernobyl

Reactor Design Flaws (RBMK-1000):

- Positive void coefficient: reactivity increased with steam formation (dangerous instability)
- No containment building (unlike Western reactors)
- Graphite moderator (flammable; contributed to fire)

Human Factors:

- Inadequately trained personnel conducting safety test
- Violation of safety protocols
- Hierarchical culture that discouraged junior staff from questioning superiors

Safety Culture Deficit:

- "Safety culture" as a concept emerged from Chernobyl
- International Atomic Energy Agency (IAEA) codified safety culture principles post-1986
- Emphasis on: questioning attitude, rigorous procedures, continuous learning, non-punitive error reporting

Regulatory Independence:

- In Soviet system, regulator was not independent of operator
- Same ministry that promoted nuclear power also regulated it
- Conflict of interest: production targets over safety

India's Nuclear Programme: Post-Chernobyl Safeguards

Reactor Design (India Uses Safer Designs):

- Pressurised Heavy Water Reactors (PHWRs): negative void coefficient (inherently stable)
- Containment buildings (unlike RBMK)
- Multiple redundant safety systems

Regulatory Framework:

- Atomic Energy Regulatory Board (AERB) established in 1983 (pre-Chernobyl, but strengthened after)
- Under SHANTI Act (2025), AERB now has statutory status (independent of Department of Atomic Energy)

Weaknesses in India's Framework:

- AERB historically lacked autonomy (reports to DAE, not Parliament)
- SHANTI Act addresses this but implementation remains to be seen
- Civil Liability for Nuclear Damage Act (CLNDA, 2010) created supplier liability, discouraging foreign collaboration; SHANTI Act has repealed and replaced it

India's Nuclear Expansion (100 GW by 2047):

- SHANTI Act opens nuclear sector to private participation

- Indigenous PHWRs (220 MW, 540 MW, 700 MW designs)
- Prototype Fast Breeder Reactor (PFBR) at Kalpakkam achieved criticality (second stage of three-stage programme)

Lessons for India's Nuclear Energy Future

Regulatory Independence is Non-Negotiable:

- Regulator must be separate from promoter
- AERB must have financial and administrative autonomy
- Parliament must have oversight (not just DAE)

Safety Culture Across the Supply Chain:

- Train operators, maintenance staff, and contractors
- Regular safety drills and unannounced inspections
- Non-punitive error reporting to learn from mistakes

Transparent Communication:

- No repetition of Soviet-style denial
- Early notification to public and international community in case of any incident
- IAEA conventions ratified and implemented

Containment and Siting:

- All reactors must have full containment (India's PHWRs do)
- Site selection to minimise population exposure
- Exclusion zones around reactors

Emergency Preparedness:

- Off-site emergency plans for all nuclear installations
- Regular drills involving local population, district authorities, and hospitals
- Stockpiles of potassium iodide (blocks thyroid uptake of radioactive iodine)

International Cooperation: Treaties and Conventions

Post-Chernobyl Conventions (Both Adopted in 1986):

- **Convention on Early Notification of a Nuclear Accident:** Obligation to notify affected states and IAEA promptly
- **Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency:** Framework for cross-border assistance

India's Status:

- India is a party to both conventions
- However, India is not a signatory to the Convention on Supplementary Compensation for Nuclear Damage (CSC) – depends on SHANTI Act's liability framework

The Nuclear Suppliers Group (NSG):

- India has NSG waiver (2008) for civil nuclear cooperation
- Foreign reactors (Kudankulam: Russian VVERs) built under IAEA safeguards

Conclusion

Forty years after the Chernobyl disaster, its lessons remain stark: nuclear risks cross borders, secrecy is dangerous, and safety culture must be uncompromising. As India expands capacity under the SHANTI Act, priorities are clear—independent regulation, robust containment, trained personnel, transparency, and emergency preparedness. Even with safer PHWR designs, safety depends on sustained vigilance, not technology alone.

Kalpakkam Milestone: India's Three-Stage Nuclear Programme Enters Second Stage

Introduction

The PFBR's (Prototype Fast Breeder Reactor) criticality at Kalpakkam marks a major step in India's three-stage nuclear programme, realising Homi Bhabha's vision. Beyond its technological feat, it advances energy security and strategic autonomy.

Main Body

Why Nuclear Energy Matters Now

Global Context:

- Nuclear energy is now seen as a critical source of clean and abundant energy
- Essential to satisfy growing energy requirements while reducing fossil fuel dependence

India's Specific Imperative:

- Potential to free up or significantly reduce dependence on energy imports
- Reduces vulnerability to external shocks (as seen in the Iran war)
- Critical for energy security and strategic autonomy

India's Uranium Constraint:

- Main fuel (uranium) is not adequately available domestically
- India's nuclear sector remains dependent on other countries for fuel

India's Three-Stage Nuclear Programme

Stage 1 (Current Mainstay):

- Pressurised Heavy Water Reactors (PHWRs)
- Use natural uranium as fuel
- Produce plutonium as by-product

Stage 2 (Now Commencing at Kalpakkam):

- Fast Breeder Reactors (FBRs)
- Use plutonium from Stage 1 as fuel
- Breed more plutonium than they consume
- Incredibly more challenging to design, build, and operate than PHWRs

Stage 3 (Future Vision):

- Use thorium as main fuel
- Thorium is found in abundance in India
- Would make India truly energy independent

The Visionary Insight of Homi Bhabha:

- Articulated this three-stage pathway over seven decades ago
- Understood India's uranium constraints and thorium abundance
- Recognised that strategic autonomy required indigenous fuel cycle

The Journey Was Never Easy

Timeline:

- First test fast breeder reactor could only be built in the early 2000s
- Several times during the journey, it appeared India had lost focus
- Attainment of criticality at Kalpakkam is a long-awaited milestone

What This Milestone Means:

- Hopefully puts the transition on the fast track once again
- Commences the second stage of the three-stage programme

Signs of Serious Effort for Rapid Expansion

Recent Developments (Last Couple of Years):

- Setting up of a nuclear energy mission
- Enactment of the SHANTI Act (opening nuclear sector to private participation)
- Push for development of Small Modular Reactors (SMRs)

- Opening up of nuclear sector for private investment

The Signal:

- India is finally making serious efforts for rapid expansion of its nuclear sector
- Multiple policy and legislative initiatives moving in parallel

Way Forward

Immediate Priorities:

- Ensure stable operation of Kalpakkam PFBR
- Build additional fast breeder reactors based on demonstrated technology
- Operationalise SHANTI Act to attract private investment

Medium-Term Goals:

- Scale up Stage 2 to meaningful capacity
- Accelerate research on Stage 3 thorium reactors
- Develop domestic supply chain for nuclear components

Long-Term Vision:

- Achieve energy independence through thorium utilisation
- Reduce import dependence for both fossil fuels and nuclear fuel
- Position nuclear as complement to renewables for baseload power

Conclusion

The attainment of criticality at the Prototype Fast Breeder Reactor in Kalpakkam marks a key step in India's three-stage nuclear programme, realising Homi Bhabha's vision. It strengthens energy security and strategic autonomy, signalling renewed momentum in nuclear expansion despite persistent challenges.

Manipur Crisis: Internal Security, Law and Order, and Border State Vulnerabilities

Introduction

Since May 2023, Manipur has witnessed ethnic violence between Meiteis and Kuki-Zo/Naga groups, leaving over 260 dead and nearly 60,000 displaced. Triggered by the ST status demand for Meiteis, the crisis exposed deep ethnic divides, weakened law and order, and border vulnerabilities with Myanmar. Despite President's Rule and a new government, continued unrest shows that containment has failed and lasting reconciliation is essential.

Main Body

Roots of the Crisis: Ethnic Fault Lines and Governance Failures

The current conflict is not sudden but the result of decades of "administrative abstinence". Dipping indices of employment, education, and healthcare have hardened identity politics among Meiteis, Kuki-Zos, and Nagas.

The 2023 Trigger: A Manipur High Court directive to the state government to consider ST status for the majority Meitei community. Kuki-Zo groups feared this would dilute their existing rights over land and jobs, leading to widespread protests that turned violent on May 3, 2023.

Root Causes:

- **Historical Grievances:** Competition over land, forest rights, and government jobs between valley and hill communities.
- **Porous Border:** The unfenced 398-km border with Myanmar allows free movement of insurgents, weapons, and narcotics. The 2021 Myanmar military coup intensified arms flow and refugee influx, destabilising the region.
- **Developmental Neglect:** Lack of economic opportunities fuels alienation, making youth vulnerable to militant recruitment.

Internal Security Challenges: Militancy, Weapons, and Polarisation

Manipur's internal security architecture is under severe strain due to the proliferation of arms and the ethnic divide within the police force.

- **Weapons Proliferation:** The conflict has seen the use of sophisticated weapons, including rocket-propelled grenades and improvised mortars. On April 7, 2026, a projectile attack killed two children in Tronglaobi, triggering the latest wave of unrest. The "free flow of weapons" remains an urgent security challenge.
- **Cyber Threats & Hate Speech:** Militant groups use social media to incite violence. Manipur Police recently arrested individuals for spreading inflammatory content online, highlighting the new digital dimension of internal security threats.
- **Security Forces Under Fire:** There have been instances of protesters storming CRPF camps and vandalising property. In a worrying development, a Manipur policeman was arrested for joining violent protests and "turning on his own force," revealing deep ethnic polarisation within the state's law enforcement machinery.

Law and Order Breakdown: From Polarisation to Paralysis

The ethnic divide has crippled the criminal justice system.

- **Police Polarisation:** Kuki officers retreated from Meitei-dominated valleys, and Meitei officers left Kuki areas. This led to allegations of bias in registering FIRs, with "zero FIRs" being filed for crimes in hostile territories.
- **Relief Camp Conditions:** Two years into the conflict, over 58,000 internally displaced persons (IDPs) live in 281 relief camps. Reports highlight a lack of food, sanitation, healthcare, and education, leading to a "slow humanitarian disaster".
- **Protest and Civil Unrest:** Following the April 2026 killings, massive protests led to curfews, internet shutdowns, and clashes with security forces. Civil society groups have called for boycotts, indicating that "the fractures of the past two years remain largely unhealed".

The Border State Dimension: Myanmar's Spillover Effect

Manipur is a critical border state in India's Act East Policy, but its connectivity with Myanmar is a double-edged sword.

- **Strategic Vulnerability:** The India-Myanmar border is highly porous. The ongoing civil war in Myanmar has led to an influx of refugees and allowed ethnic armed groups (EAOs) from Myanmar to exploit kinship ties with Kuki-Zo communities in Manipur.
- **Fencing and FMR:** The government is constructing a fence along the border and scrapped the Free Movement Regime (FMR) to curb illegal movement. However, experts note that this disrupts traditional social networks and may not be sufficient without a comprehensive regional security strategy.
- **Geopolitical Competition:** China's growing influence in Myanmar, including support for the military junta and infrastructure projects, poses a long-term strategic challenge. Beijing could potentially use ethnic tensions in Manipur to exert pressure on New Delhi.

Government Response and Rehabilitation Efforts

The central and state governments have initiated several measures, but critics argue they are inadequate.

- **President's Rule (Feb 2025):** Imposed after the resignation of N. Biren Singh, aiming to stabilise the administration.
- **Housing for IDPs:** The Centre approved the construction of 5,000 houses under PMAY-G for displaced families. The state has resettled 16,500 IDPs so far, though tens of thousands remain in camps.

- **Bridge-Building:** Chief Minister Khemchand Singh has met Kuki-Zo and Tangkhul leaders. However, militants attacked a village the day after his visit, highlighting the fragility of peace efforts.

Way Forward: From Containment to Repair

The crisis requires a shift from reactive security measures to proactive political and humanitarian repair.

- **Humanitarian Priority:** Immediate improvement of relief camp conditions and expedited rehabilitation for the 60,000 displaced persons.
- **Weapons Freeze:** A concerted campaign to recover looted and illegally held weapons.
- **Inclusive Dialogue:** A time-bound political dialogue involving all stakeholders (Meitei, Kuki, Naga) to address land rights, political representation, and internal boundaries.
- **Border Management:** Strategic fencing of the Myanmar border combined with community-specific engagement to prevent the spillover of external conflicts.
- **Accountability:** Prosecution of hate speech and violence must be swift and impartial to restore trust in the justice system, as emphasised by human rights bodies.

Conclusion

The Manipur crisis shows how identity tensions, underdevelopment, and porous borders can threaten internal security. With mass displacement and cross-border spillovers from Myanmar, restoring peace requires more than force—priority must be given to rehabilitation, arms control, and inclusive dialogue. Lasting stability depends on justice, accountability, and empathetic governance.

India's LPG Vulnerability: A Strategic Risk in Every Kitchen

Introduction

India faces a structural LPG mismatch: domestic output meets only ~40% of demand (~33 MT), forcing ~60% imports. Since LPG is primarily a household fuel, unlike flexible industrial use, this dependence creates persistent supply vulnerability.

Main Body

India's Exposure: A Household Vulnerability Matrix

The Key Data:

- **LPG import share of total demand:** 60%
- **LPG imports as % of domestic production:** 150%
- **Household kitchen criticality of LPG:** Very high
- **LPG cover/storage position:** 15 days operational tankage cover; ~1.5 days in cavern-based deep storage (140,000 tonnes at Visakhapatnam and Mangaluru)

Comparative Vulnerability:

- **Japan:** Imports 70% of LPG, but only 40% of households use LPG (electricity 55%, city gas large base). Storage: 108.3 days.
- **China:** Imports 40.4% of LPG, but large share driven by petrochemical sector. Household vulnerability low to moderate.
- **South Korea:** Imports ~74.5% of LPG, but household energy supported by natural gas and electricity. Storage: 15-30 day framework.

The Indian Exception:

- India's problem is not that it imports LPG—many countries do.
- India's problem is that it imports LPG for the one use that is hardest to defer and hardest to replace quickly: household cooking.

The Strait of Hormuz: No Longer a Dependable Corridor

The Vulnerability:

- About 90% of India's LPG imports normally transit the Strait of Hormuz.

- The West Asia war has exposed this sharply.
- Even if present tensions ease, the old assumption of uninterrupted normality will not return easily.
- The risk attached to this route has now entered the strategic calculation in a lasting way.

What This Means:

- India cannot treat the Strait of Hormuz as a routinely dependable corridor for household fuel security.
- A corridor that was once a logistics route is now a strategic vulnerability.

Storage: Thin Reserve-Style Protection

Operational Tankage Cover:

- About 15 days across import locations, bottling plants, refineries, and fractionators (PPAC data).
- Shows the system is not empty—but operational cover is not strategic reserve.

Cavern-Based Deep Storage:

- Visakhapatnam: 60,000 tonnes
- Mangaluru: 80,000 tonnes
- Total: 140,000 tonnes
- **Equals only about 1.5 days of national demand**

The Gap:

- For a country of India's size and import dependence, reserve-style protection is still very thin.
- Japan has 108.3 days of storage. India has 1.5 days of deep storage.

What India Must Do: Four Policy Priorities

First: Reserve Domestic Molecules for Kitchens

- Stop treating all LPG molecules as one pool.
- Direct refiners to prioritise propane and butane for cooking LPG rather than petrochemical or gasoline-blending use.
- Domestically produced LPG should be reserved first for household fuel security.
- Petrochemical users should increasingly arrange their own feedstock imports.
- The government should not have to defend domestic kitchens and industrial feedstock demand from the same protected pool.

Second: Build a Deeper LPG Buffer

- Initial goal: 2 to 3 weeks of protected cover for the household pool.
- At current demand levels: 1.3 million tonnes for 14 days; 1.9 million tonnes for 21 days.
- This is a large jump from current cavern capacity (0.14 million tonnes).
- But this is the minimum scale at which India can begin to claim meaningful resilience.

Third: Sustained Campaign for Electric Cooking

- Target urban and semi-urban India.
- Households with reliable power, adequate wiring, and access to induction cooking should be encouraged to shift primary cooking load away from LPG.
- A 'Give it up 2.0' plan should be launched.
- The aim: reduce the number of homes for which the LPG cylinder remains the first and only kitchen fuel.
- Piped Natural Gas (PNG) should expand where density supports it, but electricity is the broader lever.

Fourth: Diversify Import Sources and Corridors

- Reduce concentration on the Strait of Hormuz (currently 90%).
- Explore alternative supply routes and long-term contracts with non-Gulf suppliers.
- Build strategic partnerships for LPG supply resilience.

Conclusion

India faces a structural LPG vulnerability: ~60% imports (mostly via Strait of Hormuz) and over 90% used in households, leaving little flexibility. With minimal storage (~1.5 days) and tight global supply, the solution lies in reserving domestic LPG for kitchens, separating petrochemical use, building a 2–3 week buffer, and promoting electric cooking.

Mangroves in India: Guardians of the Coast

Introduction

Tamil Nadu's plantation of 20,000 mangroves along the Buckingham Canal to boost Chennai's climate resilience comes amid growing concern, as studies show up to 15% of the Sundarbans are losing recovery capacity due to cyclones, rising temperatures, and upstream dams.

Mangroves are salt-tolerant plants found in tropical coastal intertidal zones. As per India State of Forest Report 2023, India's mangrove cover is 4,991.68 sq. km (0.15% of area), rising steadily since 2001. Despite gains, they face threats from urbanisation, aquaculture, pollution, and climate change, making conservation crucial.

Main Body

State-Wise Distribution of Mangroves in India

The distribution of mangroves is highly concentrated, with three regions accounting for nearly 78% of the total cover:

- **West Bengal (42.45%):** Holds the largest share—**2,119 sq. km**—primarily the Sundarbans, the world's largest contiguous mangrove forest and a UNESCO World Heritage Site. It acts as a critical bio-shield for Kolkata and surrounding regions.
- **Gujarat (23.32%):** Ranks second with approximately **1,164 sq. km**. The Gulf of Kutch and Gulf of Khambhat are key zones.
- **Andaman & Nicobar Islands (12.19%):** Pristine mangroves support rich biodiversity.
- **Others:** Andhra Pradesh, Odisha, Tamil Nadu, Maharashtra, and Goa comprise the remaining share.

Ecological Importance & Climate Resilience

Mangroves are indispensable for coastal ecology and climate adaptation:

- **Natural Coastal Shield:** The dense, tangled root systems stabilize shorelines and act as buffers against cyclones, storm surges, and coastal erosion. **Case Study:** During the 2004 Indian Ocean Tsunami, villages in Tamil Nadu with healthy mangrove belts suffered significantly less damage than those without.
- **Blue Carbon Sinks:** Mangroves are among the most carbon-rich forests, storing **7.5–10 times more carbon per acre than tropical rainforests**. The Sundarbans alone store an estimated **33 million tonnes of carbon**.
- **Biodiversity Hotspots:** They serve as critical breeding and nursery grounds for fish, crabs, and birds, supporting coastal fisheries. **Example:** Bhitarkanika (Odisha) and Sundarbans support species like the Saltwater Crocodile and the Royal Bengal Tiger.
- **Livelihood Support:** Millions depend on mangroves for firewood, honey, fishing, and ecotourism, forming a crucial socio-economic safety net.

Major Threats to Mangroves

Despite legal protections, mangroves face severe anthropogenic pressures:

- **Urbanization & Reclamation:** Infrastructure projects (ports, housing, airports) lead to large-scale clearing. **Eg:** Mangrove loss in Mumbai due to the Navi Mumbai International Airport.
- **Aquaculture Expansion:** Conversion into shrimp farms (prawn aquaculture) disrupts hydrology and salinity. **Eg:** Andhra Pradesh lost significant tracts to aquaculture.
- **Pollution:** Industrial effluents, oil spills, and plastic waste degrade soil and water quality. **Eg:** Thane Creek, Mumbai, suffers heavy pollution impacting flamingo habitats.

- **Climate Change:** Rising sea levels and changing salinity affect regeneration, particularly in low-lying deltas like the Sundarbans.

Government Initiatives & Legal Framework

India has implemented robust regulatory and promotional measures:

A. Regulatory Framework:

- **Coastal Regulation Zone (CRZ) Notification, 2019:** Categorizes mangroves as **Ecologically Sensitive Areas (ESAs)** , restricting activities within a 50-meter buffer. It mandates **compensatory replantation at a 3:1 ratio**.
- **Wildlife Protection Act (1972)** & **Indian Forest Act (1927):** Provide additional legal backing for protection.

B. Promotional Flagship Schemes:

- **MISHTI (Mangrove Initiative for Shoreline Habitats & Tangible Incomes):** Launched on **June 5, 2023**, it is the central scheme for mangrove restoration across 13 States/UTs. It operates through **convergence** (CAMPA, MGNREGS). **Achievement:** Over **22,560 hectares** taken up for restoration in 2023-25.
- **National Coastal Mission:** Provides financial assistance for conservation on a **60:40 cost-sharing model** (Centre:State).
- **GCF-ECRICC Project (Green Climate Fund):** Active in Andhra, Maharashtra, Odisha, focusing on enhancing climate resilience and restoring over 10,000 hectares.

Regional Success Stories & Case Studies

- **Gujarat (The Leader):** Under MISHTI, Gujarat has acquired **19,220 hectares** (85% of the national target), driven by efficient governance and public-private partnerships.
- **Tamil Nadu (Community-Led):** Under the Green Tamil Nadu Mission, local communities (SHGs) participated in digging tidal canals and removing invasive species (Prosopis). This doubled the state's mangrove area from **4,500 ha to 9,000 ha (2021–2024)**.
- **Maharashtra (Corporate Partnership):** Amazon's "Right Now Climate Fund" ($1.2 million) supports restoration along Thane Creek, combining trash booms for plastic interception with massive sapling plantations.

Way Forward

Challenges:

- **Regional Disparity in Implementation:** While Gujarat leads with 85% of MISHTI land, West Bengal (holding 42% of India's mangroves) has only seen **10 hectares** taken up under the scheme.
- **Blue Carbon Potential Untapped:** India's blue carbon ecosystems could generate **~$9.6 billion** in green payments, but this remains largely unexplored.
- **Aquaculture Pressure:** Brackish water aquaculture continues to be a significant threat in states like Andhra and West Bengal.

Recommendations:

1. **Strengthen Community-Based Conservation:** Empower Eco-Development Committees (EDCs) and SHGs through training in sustainable harvesting (e.g., honey, crabs) as seen in Navghar, Maharashtra.
2. **Integrate into Climate Finance:** Leverage the "Blue Carbon" market to attract private investment for restoration under the MISHTI framework.
3. **Focus on the Sundarbans:** Address the specific vulnerabilities of the Sundarbans (sea-level rise, freshwater scarcity) through a dedicated climate adaptation fund.

Conclusion

Mangroves are India's coastal shield, but despite gains through initiatives like MISHTI, uneven restoration and threats from urbanisation and aquaculture persist. A shift to holistic management, blue carbon finance, and community-led conservation is key to safeguarding these "Guardians of the Coast."

PAPER 4

CASE STUDY

Q.1) You are a senior officer in the Ministry of Home Affairs. During an internal review of a large surveillance programme designed to combat organized crime and terrorism, you discover that a private technology vendor has been collecting and storing citizens' personal data beyond the scope authorized by law.

A confidential report prepared by your team indicates serious concerns regarding privacy violations, inadequate oversight, and possible misuse of sensitive information. However, the programme has also played a significant role in preventing several security threats and enjoys strong support from senior policymakers.

A young officer in your department, disturbed by the findings, approaches you and states that if corrective action is not taken immediately, he may disclose the information to the media in the public interest. Meanwhile, your superiors advise you to treat the matter as an internal issue, arguing that public disclosure could undermine national security operations, create panic, and damage public trust in government institutions.

You are convinced that the concerns are genuine, but you also recognize that abrupt disclosure could compromise ongoing investigations and national security interests.

1. Identify the ethical issues and stakeholders involved in the case.
2. Examine the ethical tension between transparency, privacy, accountability, and national security.
3. What options are available to you? Evaluate their ethical and administrative implications.
4. As the senior officer concerned, what course of action would you adopt? Justify your decision using ethical principles and public service values. **(20 Marks)**

Q.2) You are the Medical Superintendent of a government hospital in a metropolitan city. Following a major industrial accident, hundreds of injured workers are rushed to your hospital within a few hours. The hospital's emergency facilities, ICU beds, ventilators, and specialist doctors are insufficient to handle the sudden influx of patients.

Among the injured are:

- Several critically injured workers with uncertain chances of survival.
- A pregnant woman requiring immediate surgery.
- A renowned scientist working on a nationally important project.
- A local political leader whose supporters are demanding priority treatment.
- Numerous migrant workers with serious but treatable injuries.

As news spreads, political representatives, media personnel, and influential groups begin contacting the hospital administration. Some officials suggest prioritizing individuals whose survival may have greater societal impact. Others insist that treatment should be provided strictly according to medical urgency and established protocols.

Doctors are exhausted, families are desperate, and every decision may mean the difference between life and death.

1. What ethical issues and conflicts arise in this situation? Identify the stakeholders.
2. Discuss the ethical principles that should guide resource allocation during public emergencies.
3. Evaluate the alternative approaches available for prioritizing treatment in this case.
4. As Medical Superintendent, what decision-making framework would you adopt? How would you ensure fairness, transparency, and public trust while dealing with intense external pressures? **(20 Marks)**