



KNOWLEDGE
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PREPARATION
WITH PURPOSE

SEPTEMBER 2026

CURRENT AFFAIRS MAGAZINE

ANALYSE
UNDERSTAND
CONNECT
PREPAREA MONTHLY
COMPANION
FOR THOUGHTFUL
CIVIL SERVICES
PREPARATION

INSIDE THIS EDITION

The **September 2026** issue covers the month's current affairs in ten **GS-wise Parts (A to J)**, an **Ethics section (Part K)** and a **GS-wise Prelims Booster** at the end. It has two kinds of content, each written for a different job.

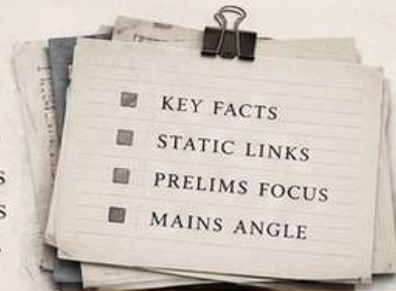
01 Full Articles (Mains Relevance)

44 detailed articles on the month's biggest issues. Each one builds the background, the arguments and a way forward, so you can use it directly in Mains answers.



02 Notes (Prelims Relevance)

Short, **fact-focused notes** on smaller news items. Each one carries the facts and static links that Prelims questions are built on, plus a short Mains angle.



03 Boxes and Quick Facts

Compact clusters on species, protected areas, conventions, institutions and science news, kept together so they are **easy to revise**.



04 Prelims Booster

One consolidated, GS-wise list of **static and current facts**.

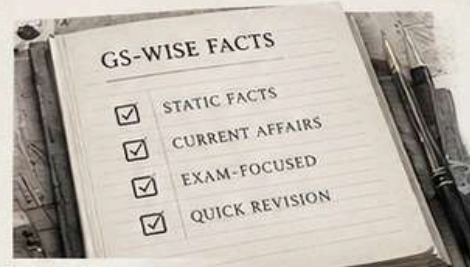


Table of Contents

Part A: Cover Story.....1

- BRICS 2026: The New Delhi Summit and India's Balancing Act

Part B: Polity, Governance and Judiciary 2 to 19

Full Articles (Mains Relevance)

- Electoral Democracy: EC Appointment Law and SIR Deletions
- FCRA Amendment Bill, 2026: Regulation vs Executive Overreach
- Conscience and Academic Freedom: Vande Mataram and the IIT Delhi Row
- Arrest, Grounds of Arrest and Bail
- Uniform Civil Code: Constitutional Vision vs Religious Diversity
- Article 17 and the Haldwani Case: Untouchability and the Idea of "Purity"
- Right to Work Under Strain: From MGNREGA to VB-GRAM G
- Article 371K and Ladakh: A New Model of Special Status
- Higher Judiciary: Integrity, Distinguished Jurists and the Collegium
- Revising India's Model BIT: Investor Protection vs Regulatory Space
- Forest Rights and Gram Sabha Consent: A Weakening Safeguard?

Notes (Prelims Relevance)

- Personal Law vs Criminal Law: Marital Rape Exception and POCSO
- CBI General Consent
- Navodaya Schools in Tamil Nadu and the Language Formula
- Water Federalism: River-Linking, the Sone MoU and the Kishau Project

Part C: International Relations.....19 to 31

Full Articles (Mains Relevance)

- West Asia on the Brink: Iran War, Hormuz and the Red Sea Crisis
- Pakistan's Gulf Pivot: Strategic Depth or Strategic Overstretch?
- India-China: Early Harvest Talks, Modi-Xi Meeting and the Pakistan-China Boundary
- US Sanctions Act on Russian Oil: India's Energy Security and Strategic Autonomy
- India-Japan Defence Partnership: From Strategic Convergence to Operational Capability
- Transboundary Rivers: The Indus Waters Treaty Ruling and China's Yarlung Zangbo Dam

Notes (Prelims Relevance)

- India-Sri Lanka: Defence Minister's Visit, L70 Guns MoU and SLINEX-26
- Greenland and the Arctic: The US-Denmark-Greenland Security Deal
- Europe Outreach: Belgium, Germany and UK Carbon-Price Recognition
- SCO and Central Asia: Bishkek Summit and the Islamabad Meeting
- ASEAN and South-East Asia: AIMMAF, ADMM-Plus and the Philippines
- A G2/G3 World: Great-Power Rivalry and the US-China AI Talks

Global Institutions Box

- UNSC Veto Reform
- UNCLOS: The "Constitution of the Oceans"
- "Correct the Map" Resolution
- WHO Pandemic Agreement and PABS

Part D: Economy, Agriculture & Infrastructure 31 to 45

Full Articles (Mains Relevance)

- Growth and Measurement: Q1 FY27 GDP, the New Series and Double Deflation
- Make in India at 12: A Patchy Report Card
- The Middle-Income Trap, Skills and the Road to Viksit Bharat @2047
- Inflation Targeting at 10: Does the 4% Framework Fit India?
- Farm Inputs and Crop Resilience: Sugarcane Red Rot and the Sulphur Shock
- Data Centres: Digital Boom vs Climate Reality
- Food Systems: Food Loss and Waste, and Decentralised Grain Storage

Notes (Prelims Relevance)

- Fiscal Deficit at 26.8% of Target and Tax Devolution
- JCR Upgrades India's Credit Rating to 'A-'
- Offer for Sale and India's IPO Boom
- FPI Outflows and Rupee Depreciation
- Kandla, JNPA, Mundra and Paradip Notified as Mega Ports
- Clean Fuels and Transport: e-Methanol at Kandla and India's First LNG Train
- Energy Transition: Small Hydro Power and Geothermal Energy at Puga
- Industrial Indicators: IIP at 8% and the Index of Core Industries
- Merchant Discount Rate on UPI Payments
- Bankers' Books Evidence Act, 2026

- Coal India's Technology-Led Diversification
- Clean Freight: PACT and the Zero Emission Truck Marketplace

Commodity and Sector Quick Facts

- Jute, Coir, Bamboo, Onion, Assam Pu'er Tea, Dryland and Regenerative Agriculture

Part E: Environment, Climate and Ecology

.....45 to 59

Full Articles (Mains Relevance)

- Super El Nino 2026: Monsoon, Heat, Coral and Forest Risks
- Stubble Burning, "Red Entry" Rules and the CAQM
- Waste and the Circular Economy: E-Waste, WCEF and Rural Models
- Western Ghats ESA: Gadgil vs Kasturirangan and Kerala's Reset Demand
- Project Cheetah: Four Years of Reintroduction
- COP31, the UNEP Overshoot Report and India's Climate Targets

Boxes

- Wild Species in News: Leopardus tilcayo, Himalayan Monal, Pygmy Hog, Striped Hyena, Dragonflies, Spot-billed Pelican, Rare Turtles in Haryana, Great Indian Bustard
- Protected Areas in News: MEE-TR 2026, Kedarnath WLS, Muthanga, Manas, Valmiki Tiger Reserve, Community and Conservation Reserves
- Wetlands, Mangroves and Ramsar Sites: Pichavaram, Mangrove Initiatives, Other Wetlands in News, Ramsar and Wetland Protection
- International Conventions: UNFCCC and COP, Paris Agreement, Vienna-Montreal-Kigali, CBD-Nagoya-Kunming-Montreal, BBNJ, CITES and Ramsar
- Environmental Institutions: NGT, CAQM, CPCB, NTCA, NBA, IBCA
- Conservation Quick Facts: PRAMAAN Certificates, World Ozone Day 2026

Part F: Science, Technology and Digital Sovereignty

.....59 to 69

Full Articles (Mains Relevance)

- Semiconductors: Semicon 2.0 and SEMICON India 2026
- EOS-05 and GSLV-F17: India's First Geosynchronous Imaging Satellite
- Quantum-Safe Communication: C-DOT's Indigenous Products
- Time Sovereignty: IST, NavIC and "One Nation, One Time"

- Nuclear Energy: Thorium, the Three-Stage Programme and the SHANTI Act
- India's Homegrown Innovation Ecosystem: From Importing Technology to Inventing It

Boxes

- Strategic and Safety Technology: Kavach 4.0, Deep-Sea Mining, Deep Ocean Mission and MATSYA-6000, ORV Sagar Manthan, OptoSAR
- S&T Quick Hits (Space and Astronomy): Nancy Grace Roman Space Telescope, Australe Basin, Voyager Missions
- S&T Quick Hits (Health and Biotechnology): Brain-Eating Amoeba, PFOS, Incendiamoeba, Badri Cattle OPU-IVF, Zika and Hepatitis C Detection, Nanomedicine, Green Forge and BioE3
- S&T Quick Hits (Digital and Institutions): BHASHINI, CSIR's Regional Science Magazines

Part G: Internal Security and Defence

.....70 to 73

Full Articles (Mains Relevance)

- Strategic Deterrence: Nuclear Doctrine Review and Space Weapons

Notes (Prelims Relevance)

- NIA Court Issues Arrest Warrant against Hafiz Saeed
- Vibrant Villages Programme: Turning "Last Villages" into "First Villages"
- Manipur: The New Kuki-Zo-Naga Fault Line
- Defence Indigenisation and Diplomacy: RAKSHA, VIMARSH and the NGMV
- Maritime Security: The 1991 India-Pakistan Agreement and MAHASAGAR

Part H: Geography and Disaster Watch

.....73 to 76

Full Articles (Mains Relevance)

- Maps, Projections and Power: Mercator vs Equal Earth

Notes (Prelims Relevance)

- Gandak River and the September Flash Flood
- India-Netherlands Water Cooperation: The Kalpasar Project

Part I: History, Art and Culture

.....76 to 85

Full Articles (Mains Relevance)

- Poompuhar Underwater Excavation: Evidence of Ancient Maritime Trade

- Indian Crafts, GI Tags and Cultural Misappropriation
- Tulu Gets Additional Official Language Status in Karnataka

Notes (Prelims Relevance)

- National Maritime Heritage Complex at Lothal
- Battle of Haifa: India's Forgotten Cavalry Triumph
- The Baltic Way and Gandhian Influence
- The Cardiff Agreement and the Structure of the UK
- Sowa Rigpa: The Himalayan System of Medicine
- Silk in India: Central Silk Board's 77th Foundation Day
- MoTA-IGNCA MoU on Tribal Cultural Heritage
- Bharatanatyam and the Legacy of Indu Mitha
- Gondhal: The Folk Ritual behind India's Oscar 2027 Entry

Part J: Society, Labour and Health.....85 to 92

Full Articles (Mains Relevance)

- Demographic Dividend and Skilled Talent Mobility: From Brain Drain to Brain Circulation
- Women in India: Gender Gap Index, Informal Work and the Contraception Gap

Notes (Prelims Relevance)

- Census 2027 and Caste Enumeration
- Women's Reservation, the 106th Amendment and the NCW Workshop
- Pension Sakhis: SHG Women as Retirement Guides
- Social Security for Informal and Gig Workers
- Mental Health as the Anchor of Public Health
- Health Watch: AMR, Fungal Resistance to a Transplant Drug, CCTV at Medical Stores, Rare-Disease Drugs, HPV Vaccination, Bhutan's Rabies Elimination, 9th Rashtriya Poshan Maah
- Urban India: Swachh Vayu Sarvekshan 2026

Part K: Ethics Case Studies.....93

- Case 1: The Booth Level Officer and the Deletion Target
- Case 2: The District Collector and Stubble Burning
- Case 3: The Vice-Chancellor and the Convocation
- Case 4: The NGO Hospital and the FCRA Deadline

Prelims Booster 94 to 103

GS Paper I

- **Art, Culture and Personalities:** Dadasaheb Phalke Award, Ramon Magsaysay Award, Sir M. Visvesvaraya and Engineers' Day

- **Geography:** Mahanadi River, Brahmani River, Niyamgiri Hills and Bauxite, Falkland Islands, Nauru Renamed Naoero
- **Society:** Literacy, Adoption and CARA

GS Paper II

- **Polity and Constitution:** Bail, Special Investigation Team, Lieutenant Governor and Union Territories, DISHA 2.0 and Access to Justice
- **Governance and Welfare Schemes:** PM-AJAY, PMAY-Urban 2.0, PM Vishwakarma, PMMVY and the Poshan Framework, NAMASTE, Skilling and Recruitment Schemes, PM SHRI Schools, PM-ABHIM, Jal Sanchay Jan Bhagidari and JJM
- **International Relations:** India-UAE CEPA and BRICS, India-China Leaders' Meeting and the Shiksham Issue, New Trade Agreements and Tools, BIMSTEC Traditional Medicine Conference, Global Indices and Their Publishers

GS Paper III

- **Economy:** Industrial and Port Indicators, ECLGS 5.0, EPF Scheme 2026 Amnesty and Labour Codes, Critical Minerals Framework, World Tourism Day 2026, Steel Slag Road.
- **Agri :** MSP and Cropping Seasons, PM-RKVY and Khet Bachao Abhiyan, PM Dhan-Dhaanya Krishi Yojana and KVKs, Sugarcane Agronomy, Tea, Fisheries and Aquaculture
- **Environment and Ecology:** Nandankanan and Rescued Orangutans, Access and Benefit-Sharing, NGT Jurisdiction, India-Japan Forest Cooperation, Coastal and Sanitation Campaigns, Natural Gas Transition
- **Sci and Tech:** Snakebite and Antivenom Research, AI Terms and the Navier-Stokes Claim, Green Hydrogen and Biotech Support
- **Disaster Management:** GLOFs and Avalanches, Doppler Weather Radar and Mission Mausam
- **Internal Security & Defence:** Military Exercises, Sarang Helicopter Display Team

PART A : COVER STORY

BRICS 2026: The New Delhi Summit and India's Balancing Act



Why in News

- India hosted the **18th BRICS Summit** at **Bharat Mandapam, New Delhi**, on **12–13 September 2026**.
- Leaders adopted the **New Delhi Declaration**, marking BRICS's **20th anniversary**.
- The summit tested India's ability to keep BRICS **"non-Western", not "anti-Western"**.

More on the News

- The theme was **"Building for Resilience, Innovation, Cooperation and Sustainability"**, with a focus on **"Humanity First"**.
- It was India's **fourth chairship**. China will chair BRICS in **2027**.
- Despite the **Iran war**, the **Hormuz disruption** and **US tariff threats**, the summit produced **over 50 outcomes**.

About BRICS

BRICS is a grouping of **emerging economies** seeking a stronger voice for the **Global South** in institutions like the **IMF, World Bank and UNSC**. It has **no permanent secretariat or charter** and works through an **annual rotating chair**.

- The term **"BRIC"** was coined in **2001**, and the first summit was held at **Yekaterinburg** in **2009**.
- South Africa** joined in **2010–11**. **Egypt, Ethiopia, Iran and the UAE** joined in **2024**, and **Indonesia** in **2025**.
- Saudi Arabia** was invited but has **not formally confirmed** its membership.

- BRICS accounts for about **50%** of the world's population, **40%** of global GDP and over **25%** of global trade.
- Its key institutions are the **New Development Bank (NDB)** in **Shanghai** and a **\$100 billion Contingent Reserve Arrangement**, which has never been used.

Key Outcomes of the New Delhi Declaration

- UN reform:** **China and Russia** backed a **greater role for India and Brazil** in a reformed UNSC.
- Financial reform:** Members sought fairer **IMF voting shares** and restoration of the **WTO dispute settlement** system.
- Terrorism:** The Declaration condemned the **Pahalgam attack** (22 April 2025), a clear diplomatic gain for India.
- West Asia:** It called for **"maximum restraint"** without naming any country, and reaffirmed a **two-state solution** for Palestine.
- Trade:** It raised concern over **unilateral tariffs and sanctions**, and launched the **Jaipur Consensus** on invoice discounting for MSMEs.
- Omission:** The **Russia–Ukraine war** was not mentioned at all.

India's Core Message: Don't Weaponise Technology

India warned that using **technology and critical minerals** such as lithium, cobalt and rare earths as **pressure tools** slows the growth of developing nations. India supports **fair access** while building **domestic capacity**.

New initiatives under India's chairship:

- A **pandemic Early Warning System**
- A **Logistics Supply Chain Cooperation Framework**
- A **start-up innovation fund**
- An **MSME portal**
- A proposed **\$10 billion Joint BRICS Insurance Company**

The Money Question

BRICS members want to trade in their **own currencies** to cut the cost of routing payments through the **US dollar**. India supports this cautiously, but draws a clear line between two ideas:

- Local currency trade:** Countries settle trade in their own currencies, such as the **rupee** or **rouble**. India gives this **cautious support**.

- **Common BRICS currency:** A single new shared currency for all members, like the euro. India **firmly opposes** this.

India's caution has three main reasons:

- **China** makes nearly **two-thirds** of BRICS exports, so a shared currency would mean **trading in yuan**.
- The US has threatened **100% tariffs** on any country backing a BRICS currency.
- Unlike **Russia and Iran**, India faces **no sanctions** that force it off the dollar.

India has instead proposed linking members' **digital currencies (CBDCs)**, but only for **trade and tourism**.

Significance

- India showed it can **build consensus** among rival members.
- BRICS stayed focused on **development**, not on becoming a **security bloc**.
- **Critical minerals** became central to the Global South agenda.
- India's case for **UNSC reform** gained support from two **permanent members**.

Challenges

- **Expansion** has brought in rivalries, such as **Iran and the UAE**, which weaken cohesion.
- **China's economy**, about **three-fifths** of BRICS GDP, risks dominating the agenda.
- BRICS institutions such as the **NDB** remain small next to the World Bank.
- Any **de-dollarisation** move may invite **US retaliation**.

Way Forward

- Ensure **time-bound delivery** of the new initiatives.
- Link **payment systems** rather than creating a common currency.
- Expand **NDB lending** in local currencies.
- Continue **multi-alignment**, deepening ties with the **US, EU and Quad** alongside BRICS.

Conclusion

- For India, BRICS is a platform for **bargaining power and diversified partnerships**, not a rival to the West. Keeping it **development-oriented** strengthens India's **strategic autonomy** in a multipolar world.

PART B : POLITY, GOVERNANCE AND JUDICIARY

Full Articles - Mains Relevance

Electoral Democracy: EC Appointment Law and SIR Deletions

Why in News

- On **24 September 2026**, the Supreme Court gave a **split verdict** on the **2023 law** for appointing the **CEC and Election Commissioners**.
- Both judges referred the matter to the **CJI** to consider listing it before a **Constitution Bench**.
- Reports of **internal ECI dissent** and **mass deletions** under the **SIR** have added urgency.

More on the News

- An investigation found that **two Election Commissioners** raised **written objections at least 14 times in 10 months** against the CEC's decisions, including on **mass deletions**.
- In **Delhi**, **54.6%** of the voter list has either been **struck off** or **served notices** demanding proof of genuineness.
- In **17 of the 19 States and UTs** under the third phase of the SIR, electoral rolls are **shrinking by more than 15%**.
- The **UN CERD** has also raised concern over **voter exclusion** during the SIR.

About the Appointment Law

- **Article 324(2)** says the **President** appoints the CEC and ECs, **subject to a law made by Parliament**.
- For **73 years**, no such law existed, so appointments stayed with the **executive**.
- Expert bodies such as the
 - **Tarkunde Committee (1975)**
 - **Dinesh Goswami Committee (1990)**,
 - **The Law Commission (170th and 255th Reports)** and
 - **2nd ARC** had recommended a more **neutral process**.

In **Anoop Baranwal v. Union of India (2023)**, the Supreme Court used **Article 142** to set up an **interim panel** of the **PM, the Leader of Opposition and the CJI**. In **December 2023**, Parliament passed a new law that **replaced the CJI with a Union Cabinet Minister** nominated by the PM.

Feature	Baranwal Panel (2023)	2023 Act
Members	PM, LoP, CJI	PM, LoP, Cabinet Minister
Balance	No government majority	2:1 government majority
Shortlisting	Not specified	Search Committee headed by the Cabinet Secretary

The Act also lets the panel **pick names outside** the shortlist. Appointments stay **valid** even if a panel seat is **vacant**.

About the SIR

The **Special Intensive Revision (SIR)** aims to clean electoral rolls by removing **duplicate, dead or shifted** voters. However, its scale and accuracy have raised serious concerns.

- In **Delhi**, **47.5 lakh** voters were marked for **deletion**.
- National projections suggest that **12–13 crore** voters could be removed from the rolls.
- **Maharashtra** alone may lose nearly **2 crore** voters.
- In **West Bengal**, RTI data showed that **91%** of **82,000** adjudicated deletions were **wrong** and had to be restored.

Provisions

- **Article 324** gives the ECI **superintendence, direction and control** of elections.
- **Article 324(5)** allows the CEC to be removed only **in the manner of a Supreme Court judge**.
- **Article 145(3)** requires a **Constitution Bench** of at least **five judges** for major constitutional questions.
- The **right to vote** is a **statutory right** under the **Representation of the People Act**.
- **Free and fair elections** form part of the **basic structure** of the Constitution.

Arguments For and Against the 2023 Act

For the Act

- **Article 324(2)** clearly allows Parliament to make the law, and *Baranwal* was only a **stop-gap**.
- The **Leader of Opposition** still sits on the panel.

- Keeping the CJI out protects the **judiciary** from future disputes over appointments.

Against the Act

- The **2:1 majority** lets the government **outvote the Opposition** every time.
- Removing the CJI removes the **only neutral member**.
- A **government official** heads the Search Committee, which weakens its independence.

Significance

- The case decides who appoints the **guardians of elections**, and so goes to the heart of **ECI independence**.
- Public **trust in the ECI** is essential for the acceptance of election results.
- It tests the balance between **Parliament's power** and **judicial review**.
- The SIR data shows how **administrative errors** can quietly **disenfranchise** genuine voters.

Challenges

- A Constitution Bench may take **years** to decide, while officials continue to function.
- **Flawed algorithms** and **rushed revisions** before elections cause wrongful deletions.
- **Booth Level Officers** effectively decide **citizenship eligibility**, with little oversight.
- The **2002 roll**, used as the baseline, itself contains errors.

Way Forward

- The selection panel should include a **neutral member**.
- The Search Committee should follow **clear, published criteria**.
- The software flagging discrepancies should be **independently audited**.
- Roll revisions should happen **well before elections**, with simple appeal options.
- The guiding principle should be **"better to include than wrongly exclude"**.

Conclusion

- India needs an Election Commission that is **independent in law and trusted in practice**. Transparent appointments and **inclusive roll revisions** are essential to protect free and fair elections.

FCRA Amendment Bill, 2026: Regulation vs Executive Overreach

Why in News

- The **Foreign Contribution (Regulation) Amendment Bill, 2026** has been referred to a **31-member Joint Parliamentary Committee (JPC)**.
- It proposes a **Designated Authority** to take over the **foreign-funded assets** of NGOs whose FCRA registration ends.
- The government cites **misuse prevention**, while critics fear **executive overreach** over civil society.

About the FCRA

- The **FCRA, 1976** was passed during the **Emergency** to stop foreign money from influencing politics and public life.
- It was replaced by the **FCRA, 2010**, which made registration **valid for five years and renewable** and created a **prior-permission** route for one-time donations.
- The law is administered by the **Ministry of Home Affairs**.

The **2020 Amendment** tightened the rules further:

- It made an account in a designated **SBI branch in New Delhi** compulsory.
- It cut the cap on **administrative spending** from **50% to 20%**.
- It **banned sub-granting** of funds to other NGOs.
- It made **Aadhaar mandatory** for office-bearers.

Section 15 of the 2010 Act already allowed assets to **vest** in an authority on cancellation, but it had **no working machinery**. As a result, States could not actually manage these assets. The 2026 Bill creates that machinery.

Key Provisions of the Bill

- **Automatic end of registration:** Registration ends if it is **not renewed in time** or if renewal is **rejected**.
- **Provisional vesting:** Foreign funds and assets, including those built **partly** from foreign money, first pass **temporarily** to the Designated Authority.
- **Restoration:** Assets are **returned** if registration is restored within the prescribed period.
- **Permanent vesting:** Otherwise, assets go to **government departments** or are **sold**, with proceeds credited to the **Consolidated Fund of India**.

- **Places of worship:** Any place of worship taken over must keep its **religious character**.
- **Office-bearers:** Trustees and directors can be held **liable** unless they prove **due diligence**.
- **Penalty:** The maximum jail term is reduced from **5 years to 1 year**.
- **Investigations:** These require **prior approval of the Centre**.

Key Data

- Since **2015**, about **22,500** NGOs have had their registrations cancelled, and only about **14,500** remain active.
- Between **2019 and 2022**, about **13,520 organisations** received **₹55,741 crore** in foreign contributions.
- **CSR spending** by listed companies reached **₹22,563 crore** in FY25, up **17.5%**.
- **Private philanthropy** was projected at about **₹1.43 lakh crore** in FY25.

Provisions

- **Article 19(1)(c)** protects the right to **form associations**, subject to reasonable restrictions under **Article 19(4)**.
- **Article 300A** says no person can be deprived of **property** except **by authority of law**.
- **Article 14** requires the State to avoid **arbitrary** action.
- **Articles 25–30** protect **religious freedom** and **minority institutions**.
- **INSAF v. Union of India (2020)** held that there is **no fundamental right** to receive foreign donations.
- **Noel Harper v. Union of India (2022)** upheld the **2020 amendments** as reasonable.

Arguments For and Against the Bill

For the Bill

- It fills a **legal gap** over what happens to assets after an NGO closes.
- It stops foreign-funded assets from being **quietly taken over** by individuals.
- It protects **national security** and makes **office-bearers accountable**.

Against the Bill

- **Mixed-funded assets** may vest entirely, even if they were partly built with domestic money.
- The Bill can act **retrospectively** on institutions built years ago.

- There is **no appeal** when renewal is simply refused.
- The vague term “**public interest**” gives the executive **wide discretion**.

Significance

- The Bill tests the line between **regulating foreign money** and **controlling civil society**.
- It applies the **proportionality doctrine** to executive power over private property.
- It raises **federal and minority concerns**, especially in the Northeast and Kerala.
- The JPC review is an example of **parliamentary oversight** at work.

Challenges

- **Essential services** such as schools and hospitals in remote areas may be disrupted.
- The **₹10 lakh activity test** under the 2026 Rules may push **small NGOs** out of the system.
- **Central approval** for investigations sidelines **State police**, affecting **cooperative federalism**.
- Provisions may face legal challenges under **Articles 14, 19 and 300A**.

Way Forward

- NGOs should get a **hearing and right of appeal** when renewal is refused.
- Only the **foreign-funded share** of an asset should vest.
- Essential institutions should be handed to **suitable non-profits**, not just government departments.
- Key terms such as “**public interest**” should be **clearly defined**.
- **Domestic philanthropy** and **CSR funding** should be encouraged to reduce dependence on foreign money.

Conclusion

- Regulating foreign funding is a **legitimate security goal**, but it must not turn into **excessive control over civil society**. **Proportionate rules** and **due-process safeguards** are key to striking this balance.

Conscience and Academic Freedom: Vande Mataram and the IIT Delhi Row

Why in News

- On **26 September**, the Supreme Court said that **genuine religious objectors** cannot be punished for not singing **Vande Mataram**.
- The case challenges a **2026 amendment** that makes singing **all six stanzas compulsory** at public functions.
- A row at the **IIT Delhi convocation** has widened the debate to **academic freedom**.

More on the News

- The Court relied on its **1986 Bijoe Emmanuel** judgment, which protected the right to **respectfully refrain** from singing the National Anthem on religious grounds.
- The **petitioner** argued that some stanzas contain **devotional references**, while the **government** defended the law as **constitutionally valid**.
- At the **57th IIT Delhi convocation** (8 August 2026), students were reportedly asked to **bow and stand** during **Vedic chants**.
- The **Free to Think 2026** report by **Scholars at Risk** rates India’s academic freedom as “**severely restricted**”, with an **Academic Freedom Index (AFI)** score of **0.14**.

About the National Song and the Law

- **Vande Mataram**, written by **Bankimchandra Chattopadhyay**, appeared in **Bangadarshan (1875)** and later in **Anandamath (1882)**.
- It was given **equal honour** with the National Anthem through **Dr Rajendra Prasad’s** statement on **24 January 1950**, but it is **not a co-anthem**.

Basis	National Anthem	National Song
Title	Jana Gana Mana	Vande Mataram
Author	Rabindranath Tagore	Bankimchandra Chattopadhyay
Fundamental Duty	Mentioned in Article 51A(a)	Not mentioned

- The **Prevention of Insults to National Honour Act, 1971** is administered by the **Ministry of Home Affairs**.

- **Section 2** protects the **National Flag** and the **Constitution** from public insult.
- **Section 3** penalises intentionally **preventing the singing** of the **National Anthem**.
- The **2026 Amendment** extends **Section 3** to the **National Song** for the first time.
- The punishment is imprisonment of up to **three years**, a fine, or both.
- Under **Section 3A**, a **repeat offence** carries a jail term of at least **one year**.

About Academic Freedom

Academic freedom is the freedom to **teach, research, learn and question** without fear of punishment, and courts read it into **Article 19(1)(a)**. The *Free to Think 2026* report recorded **382 attacks** on higher education in **59 countries**, and listed India among **22 countries** of concern.

The report's main concerns about India were:

- **Government influence** over **Vice-Chancellor appointments**.
- Restrictions on **student protests**.
- A ban on **25 books** related to **Kashmir**.

Provisions

- **Article 25** guarantees **freedom of conscience** and religion, subject to public order, morality and health.
- **Article 28(1)** bars **religious instruction** in institutions **wholly maintained** by State funds.
- **Article 51A(a)** asks citizens to respect the **Constitution, Flag and Anthem**.
- **Article 51A(h)** makes developing **scientific temper** a Fundamental Duty.
- **Secularism** is a **basic feature** (*S.R. Bommai*, 1994) and was added to the Preamble by the **42nd Amendment, 1976**.
- **Education** is in the **Concurrent List**, so central control over appointments affects **State universities** as well.

Arguments on Both Sides

In support of the law and ceremonies

- The State can decide how **national symbols** are honoured.
- Supporters see convocation rituals as **cultural tradition**, not religious instruction.
- Respect for national symbols promotes **unity and patriotism**.

Against compulsion

- Compulsory singing may violate the **freedom of conscience** under **Article 25**.
- Rituals in **State-funded institutions** may compromise **religious neutrality**.
- Pressure on students and faculty can create a **chilling effect** on free thought.

Significance

- Both cases test whether public institutions follow **constitutional morality**, including equality, secularism and freedom of conscience.
- They help define the line between **respect** for national symbols and **compelled expression**.
- **Institutional autonomy** is vital for **independent research** and a **knowledge economy**.
- Restrictions can hurt India's **global academic reputation** and its ability to attract **researchers**.

Challenges

- There is **no clear legal test** for when a **cultural practice** becomes **religious** in a State-funded institution.
- **Different accounts** of the IIT incident have made the facts **disputed**.
- **Contract faculty** may hesitate to speak freely because of **job insecurity**.
- **Weak grievance systems** make it hard for students to raise concerns safely.

Way Forward

- Institutions should adopt **written ceremonial protocols** and keep gestures like **bowing voluntary**.
- The law should respect **genuine conscientious objectors**, as *Bijoe Emmanuel* requires.
- Ceremonies should follow **inclusive and pluralistic** practices.
- **Vice-Chancellor appointments** should be **transparent and merit-based**.
- Universities should set up **independent grievance mechanisms**.

Conclusion

- Both controversies show how India balances **cultural heritage** with **constitutional values**. Respect for national symbols can coexist with **freedom of conscience** and **academic freedom** through **voluntary and inclusive** practices.

Arrest, Grounds of Arrest and Bail

Why in News

- The SC ruled that an arrested person **not informed of the grounds of arrest**, or **denied a lawyer**, may be entitled to **immediate release**.
- It also laid down strict **guidelines for re-arrest** in such cases.
- The ruling has brought the **bail framework under the BNSS, 2023** into focus.

More on the News

- The Court reaffirmed that the safeguards under **Article 22(1)** are **fundamental rights** that the police **cannot ignore**.
- It held that release after an illegal arrest gives **no blanket immunity**. Re-arrest is allowed if there are **valid legal grounds**.
- Any re-arrest now needs **judicial oversight** and **recorded reasons**, to prevent misuse of police power.
- The ruling comes as courts and police are still adjusting to the **BNSS**, which replaced the **CrPC** on **1 July 2024**.

About the Ruling: Guidelines on Re-arrest

The Court framed a set of safeguards so that re-arrest does not become a way to get around constitutional rights:

- Magistrate's approval:** Police must obtain **specific permission** from a Magistrate before re-arresting the person.
- Recorded reasons:** The application must explain **why re-arrest is needed** and **why the grounds were not given earlier**.
- Senior endorsement:** The application must be **endorsed by an immediate superior officer**.
- New investigator:** The case must be handed to a **different investigating officer** to avoid bias.
- Departmental inquiry:** Action must be initiated against the officer behind the **unconstitutional arrest**.
- Time limit:** The Magistrate should decide the application within **one week**.
- Compensation:** **High Courts** can award **compensation** where arrest safeguards are violated.

About Bail under the BNSS

- Bail** is the **conditional release** of an accused from custody, on the promise to appear in court when required.

- It is a **statutory right** in **bailable offences** and a **court's discretion** in **non-bailable offences**.
- Bail is **not a fundamental right** in itself, but its denial is tested against **Article 21**.

Type of Bail	Who Gets It
Bailable offence	Arrested person, as a right
Non-bailable offence	Arrested person, at court's discretion
Anticipatory bail	Person fearing arrest
Special powers of HC/Sessions Court	Any accused
Default bail	If probe exceeds 60 or 90 days
Long-detained undertrial	After serving half the maximum sentence

Interim bail is a **temporary release** while a regular or anticipatory bail plea is pending. It is a **judicial creation** and not a separate category under the BNSS.

Constitutional Provisions

- Article 21** protects **life and personal liberty**, which courts use to test the denial of bail.
- Article 22(1)** guarantees the right to be told the grounds of arrest and to consult a lawyer of choice.
- Article 22(2)** requires that an arrested person be produced before a **Magistrate within 24 hours**, excluding travel time.
- Article 22(3)** says these safeguards **do not apply** to **enemy aliens** or persons held under **preventive detention**.

Key Distinctions

- Bail vs parole vs furlough:**
 - Bail** is for **undertrials**
 - Parole** and **furlough** are for **convicted prisoners**.
- Anticipatory vs interim bail:**
 - Anticipatory bail** is granted **before arrest**
 - Interim bail** is a **temporary release** pending a decision.
- Default bail:** This right arises from **police delay** in filing a charge-sheet, not from the **merits** of the case.

Significance

- The ruling makes **procedural safeguards binding**, rather than a formality.

- It strengthens **police accountability** by linking violations to inquiry and compensation.
- It **balances liberty and security**: re-arrest is allowed, but only under **judicial oversight**.
- **Section 479** can help reduce **undertrial overcrowding** in Indian prisons.

Challenges

- **Police compliance** with arrest procedures remains weak on the ground.
- **Special laws** keep many accused in jail for years despite the general bail framework.
- Many arrested people, especially the poor, are **unaware** of their **Article 22 rights**.
- The shift from **CrPC to BNSS** section numbers has created **confusion** in practice.

Way Forward

- Make **written grounds of arrest** standard practice in **all cases**.
- Train police in the new **re-arrest protocol** and arrest safeguards.
- Expand **legal aid** at police stations through **NALSA** and **DISHA**.
- Review **special-law bail clauses** for **proportionality**.
- Actively use **Section 479** to release **eligible undertrials**.

Conclusion

- The ruling turns **Article 22** from a paper promise into a **real safeguard** for personal liberty. Strict police compliance and a fair bail system are essential to uphold the principle that **liberty is the rule and detention the exception**.

Uniform Civil Code: Constitutional Vision vs Religious Diversity

Why in News

- Union Home Minister said the **UCC** would be implemented in all **21 NDA-ruled States** by **2029**.
- **Uttarakhand** became the 1st State to **enact and implement** UCC after Independence in **January 2025**, and similar Bills from **Assam, Gujarat** and **MP** await the **President's assent**.

About the Uniform Civil Code

- A **Uniform Civil Code** means a **common set of secular laws** for all citizens, regardless of religion,

in matters of **marriage, divorce, inheritance, adoption and maintenance**.

- India already has uniform laws in criminal matters, such as the **Bharatiya Nyaya Sanhita**, and in contracts. **Personal law**, however, remains divided along religious lines.

Article 44, a **Directive Principle**, says the State shall “endeavour to secure” a UCC for citizens throughout India. Since DPSPs are **non-justiciable**, the UCC is a constitutional **goal**, not an enforceable right.

The Current Personal Law System

- **Hindus, Buddhists, Jains and Sikhs** are governed by the **Hindu Marriage Act, 1955** and the **Hindu Succession Act, 1956**. Sikh marriages can also be registered under the **Anand Marriage Act**, amended in **2012**.
- **Muslims** are governed by the **Muslim Personal Law (Shariat) Application Act, 1937**.
- **Christians and Parsis** follow their own **community-specific laws**.
- Many **tribal communities** follow **customary laws**, protected under **5th and 6th Schedules**.

The Constituent Assembly Debate

The framers were sharply divided on the UCC. Some members wanted it as a **Fundamental Right** to promote **national unity and gender equality**, while many **Muslim members** feared it would violate **religious freedom**. As a compromise, it was placed in the **DPSP**. **Dr B.R. Ambedkar** supported a UCC but suggested a **voluntary opt-in** model, under which it would apply only to those who chose it.

Provisions

- **Article 44** directs the State to endeavour to secure a UCC.
- **Entry 5 of the Concurrent List** lets both the **Centre and States** legislate on **marriage and divorce**.
- **Articles 14 and 15** guarantee **equality** and prohibit **discrimination**, including on the ground of sex.
- **Article 25** protects **freedom of religion**, subject to public order, morality and health.
- **Article 29** protects the right of any section of citizens to **conserve its distinct culture**.

Arguments For and Against

For the UCC

- Equal civil laws for all reflect **true secularism**.

- It can end **discrimination against women** in inheritance, divorce and maintenance.
- It promotes **national integration** and **legal clarity**.
- The Supreme Court has repeatedly **urged** the government to enact it, as in *Shah Bano (1985)* and *Sarla Mudgal (1995)* [S].

Against the UCC

- It may clash with **religious freedom** under **Articles 25 and 29**.
- **Minorities** fear it could become a **majoritarian imposition**.
- **Exempting tribal groups** raises the question of why other communities cannot be exempted too.
- The **21st Law Commission (2018)** called a UCC “**neither necessary nor desirable**” at this stage.

UCC and Women’s Rights

- **Gender justice** remains the strongest argument for a UCC.
- A gender-sensitive code could ensure **equal inheritance** for sons and daughters, **uniform divorce and maintenance** rights, and an end to **discriminatory customs** in custody and adoption.
- In the **Section 6A Citizenship Act case (2024)**, the Supreme Court held that **casteism and gender discrimination**, even if rooted in tradition, deserve **no protection under Article 29**.

The Alternative Approach

Instead of one sudden uniform code, many experts suggest a **gradual reform** model:

- Remove **discriminatory provisions** within each personal law.
- Achieve **equality within communities** before equality between them.
- Adopt Ambedkar’s **voluntary opt-in** mechanism.
- **Codify tribal customary laws** while protecting women’s rights.

Significance

- The UCC is a key test of the relationship between **Directive Principles and Fundamental Rights**.
- It raises **federal questions**, as States are acting under the **Concurrent List**.

- Its success should be measured by how well it **protects women** and **vulnerable groups**.
- It reflects the larger debate on **constitutional morality** versus tradition.

Challenges

- **Selective tribal exemptions** weaken the claim of “uniformity”.
- A **trust deficit** among minorities makes the reform look **coercive** rather than reformist.
- **State-wise codes** may create a **patchwork** of different civil laws across India.
- Customs vary **by region and community**, not just by religion, which makes drafting difficult.

Way Forward

- Reform should be **gradual and consultative**, not imposed.
- **Gender justice** should be the core principle of every draft.
- Wide consultation should include **communities, women’s groups and legal experts**.
- **Tribal customary laws** should be codified with safeguards for women.
- **Public awareness** should precede implementation.

Conclusion

- The UCC is a constitutional goal aimed at **equal rights and gender justice**. Its implementation must be **gradual, consultative and sensitive** to India’s diversity, so that it promotes both **equality and social harmony**.

Article 17 and the Haldwani Case: Untouchability and the Idea of “Purity”

Why in News

- A “**purification**” ritual was performed at a public ground in **Haldwani, Uttarakhand**, after a **Dalit political leader** held a rally there.
- The incident has raised a constitutional question: can such a ritual amount to **untouchability** under **Article 17**?

About Untouchability

- **Untouchability** is a practice rooted in the **caste system**. It treats certain groups as “impure”, so that their touch, presence or even shadow is believed to **pollute** others.

- The Constitution **does not define** “untouchability”. This is **deliberate**. Leaving the term open allows courts to apply Article 17 to **new and subtle forms** of caste discrimination as they emerge.

Provisions

- **Article 17** abolishes untouchability and forbids its practice **“in any form”**. Enforcing any disability arising from it is a **punishable offence**.
- Article 17 is enforceable against **private individuals**, not just the State. This is known as **horizontal application**.
- **Article 35** empowers **Parliament alone** to make laws punishing Article 17 offences.
- The **Untouchability (Offences) Act, 1955** was amended and renamed the **Protection of Civil Rights Act, 1955** in 1976.
- **Section 7(1)(d)** of this Act punishes **insulting an SC member on the ground of untouchability**. The insult must be **caste-based**; mere humiliation is not enough.
- The **SC/ST (Prevention of Atrocities) Act, 1989** is a **separate law**. Its **Section 3(1)(r)** punishes intentional insult or intimidation of an SC/ST member, with intent to humiliate, in **public view**.

How Courts Have Read Article 17

- **Surya Narayan Choudhary (1988)**: The **Rajasthan High Court** struck down a rule at **Nathdwara** that required Dalits to undergo **purification** before temple entry, holding that it violated **Articles 14, 15 and 17**.
- **Sukanya Shantha (2024)**: The **Supreme Court** struck down **caste-based practices in prisons**, holding that Article 17 covers discrimination based on **purity, pollution, touch and presence**.
- **Hitesh Verma (2020)**: The Court held that an insult attracts the **Atrocities Act** only if it is linked to the victim’s **caste**.
- **Gunjan @ Girija Kumari (2026)**: The Court reiterated that **“public view”** is essential for the **Atrocities Act** offence.

The Central Legal Question

- At **Nathdwara**, purification was a **condition imposed on Dalits** before entry. At **Haldwani**, the ritual took place **after the event**, and its purpose is **contested**. The ritual alone does not prove untouchability, but if a **caste-based link** is established, the reasoning in **Sukanya Shantha** and **Surya Narayan Choudhary** would apply.

Significance

- The case shows untouchability shifting from **physical exclusion** to **symbolic stigma**.
- It reflects a legal shift from protecting **access** to protecting **dignity**.
- It highlights the strength of Article 17’s **horizontal reach** against private actors.
- It shows the Constitution working as a **living document** against new forms of discrimination.

Challenges

- Proving **caste-based intent** with evidence is often very difficult.
- Deep **social acceptance** of purity-pollution beliefs makes such acts seem normal.
- Police and local officials are often **not sensitised** to these laws.
- **Slow trials** weaken deterrence in caste-discrimination cases.

Way Forward

- The **Protection of Civil Rights Act** and **Atrocities Act** should be enforced firmly.
- Legal guidance should recognise **subtle and symbolic** forms of untouchability.
- Caste-discrimination cases need **fast-track** handling.
- **Schools and community programmes** should challenge purity-pollution ideas early.
- Public figures and organisations must avoid acts that **revive caste stigma**.

Conclusion

- The Haldwani controversy shows that the abolition of untouchability remains an **unfinished task**. Article 17 protects not only equal access but also **human dignity**. Real equality will come only when the law is matched by a **change in social attitudes**.

Right to Work Under Strain: From MGNREGA to VB-GRAM G

Why in News

- On **21 August 2026**, the Supreme Court asked whether the **Right to Work** should carry the same weight as the **Right to Life** under **Article 21**.
- After **MGNREGA** was replaced by the **VB-GRAM G Act** from **1 July 2026**, rural employment **fell sharply**.

About the Right to Work in the Constitution

- The **Constituent Assembly** agreed that the right to work was vital, but disagreed on how to protect it.
- Prof. K.T. Shah** wanted it as a **Fundamental Right**, while **Dr B.R. Ambedkar** argued that India could not yet afford to guarantee it universally.
- It was finally placed among the **Directive Principles**, as a goal to be achieved progressively.

Courts have since strengthened the link between work and life:

- In **Olga Tellis (1985)**, the Supreme Court held that the **right to livelihood** is part of the **right to life**.
- In **Sanjit Roy (1983)**, it held that paying **below minimum wages** amounts to **forced labour** under **Article 23**.
- The **doctrine of non-retrogression**, affirmed in **Navtej Singh Johar**, says the State cannot **roll back** rights it has already granted.

MGNREGA vs VB-GRAM G

- MGNREGA (2005)** made work a **legal right**, guaranteeing **100 days** of unskilled manual work to every rural household **on demand**. Work had to be given within **15 days**, or an **unemployment allowance** was due. Its wages were **delinked** from the **Minimum Wages Act, 1948** in **2009**, and have since lagged behind farm wages.
- VB-GRAM G**, the **Viksit Bharat – Guarantee for Rozgar and Aajeevika Mission (Gramin)**, changes the design in key ways:

Feature	MGNREGA (2005)	VB-GRAM G
Days guaranteed	100	At least 125
Nature	Rights-based, demand-driven	Centrally Sponsored Scheme
Planning	Gram Panchayat works	Viksit Gram Panchayat Plans , linked to PM Gati Shakti
Wage	State minimum wage	₹300 per day minimum norm
State share	Small	40% for most States

Why Employment Crashed

- Transition gap:** Final rules came only on **30 June 2026**, so many districts opened **no new works** in peak-demand months.
- Burden on States:** The **40% State share** and **FRBM limits** discourage poorer States from offering work.
- Low wages:** Wages below a **living wage** reduce workers' interest.

There is a clear **paradox** here. The **2026-27 allocation** of **₹95,692 crore**, plus the State share, could take spending to **₹1.5 lakh crore**. Yet employment **fell** instead of rising.

Provisions

- Article 41** asks the State to secure the **right to work**, within its economic capacity.
- Article 39** promises an **adequate means of livelihood** for all citizens.
- Article 42** provides for **just and humane conditions of work**.
- Article 43** speaks of a **living wage** and a decent standard of life.
- Article 23** prohibits **forced labour**, which courts link to sub-minimum wages.

Significance

- The issue tests whether the State can **dilute a right** once it has been granted.
- Rural jobs act as a **safety net** during droughts, crises and the farm off-season.
- Higher rural wages raise **purchasing power** and create a **multiplier effect** on growth.
- Cost-sharing raises key questions of **cooperative federalism**.

Challenges

- Facial recognition** and **Aadhaar-based payments** may exclude genuine workers, as seen earlier with **NMMS** and **ABPS**.
- A **denotification clause** allows some areas to be left out, weakening **universal coverage**.
- Stagnant wages are pushing more women into **unpaid family work**.
- Spending of **₹1.5 lakh crore** looks unlikely at the current pace.

Way Forward

- Major scheme changes should begin only after **rules and systems are ready**.

- The **demand-driven, legally enforceable** nature of the guarantee should be preserved.
- Wages should be linked to **minimum or living wages** and paid on time.
- **Panchayats and social audits** should be strengthened to check corruption.
- Funds should flow on time so that **poorer States** are not left behind.

Conclusion

- A rural job guarantee is both a **social safety net** and a **driver of rural demand**. The sharp fall after the transition shows that design and timing matter as much as budgets. India must protect the **rights-based core** of the guarantee while improving its delivery.

Article 371K and Ladakh: A New Model of Special Status

Why in News

- The **Ministry of Home Affairs** has proposed a new **Article 371K** to give **Ladakh** special constitutional safeguards.
- It envisages a **directly elected body** for the UT with **legislative, executive, financial and planning** powers.
- Ladakh's civil society groups were disappointed because **no formal draft** was shared.

About the Background

- Ladakh was part of **Jammu and Kashmir** until **2019**.
- After **Article 370** was abrogated, the **J&K Reorganisation Act, 2019** created two UTs: **J&K**, with a legislature, and **Ladakh**, without one.
- Ladakh's groups have since demanded **Statehood, Sixth Schedule** protection and **local control** over land and jobs, and **Article 371K** is offered as a **middle path**.

About Article 371

- **Article 371** falls under **Part XXI** ("Temporary, Transitional and Special Provisions"), and allows special arrangements for regions with distinct needs.
- The original Article 371 covers **Maharashtra and Gujarat**, for regions like **Vidarbha, Marathwada, Saurashtra and Kutch**.

Over time, Parliament added a series of State-specific provisions:

- **371A (Nagaland), 13th Amendment, 1962:** Protects **Naga customs, customary law and land**.
- **371B (Assam), 22nd Amendment, 1969:** A legislative committee of members from **tribal areas**.
- **371C (Manipur), 27th Amendment, 1971:** A **Hill Areas Committee** in the Assembly.
- **371D (Andhra Pradesh and Telangana), 32nd Amendment, 1973:** **Equitable opportunities** in education and jobs.
- **371E (Andhra Pradesh) [S]:** Allows Parliament to set up a **central university**.
- **371F (Sikkim), 36th Amendment, 1975:** Special arrangements on Sikkim's **merger** with India.
- **371G (Mizoram), 53rd Amendment, 1986:** Protects **Mizo customs and land**.
- **371H (Arunachal Pradesh), 55th Amendment, 1986:** The Governor has special responsibility for **law and order**.
- **371I (Goa), 56th Amendment, 1987:** The Assembly must have at least **30 members**.
- **371J (Karnataka), 98th Amendment, 2012:** A **development board** for the **Kalyana** Karnataka region.

If adopted, **371K** would be the **first** such provision for a **Union Territory** rather than a State.

Provisions

- **Article 239** provides that UTs are administered by the **President** through an **administrator**, designated **Lieutenant Governor** in some UTs.
- **Article 240** lets the President make **regulations** for certain UTs. The proposed Ladakh body would take over some of these powers.
- The **L-G holds office at the President's pleasure**, so the President can assign **additional charge** of another UT at any time.
- **UTs with legislatures** are **Delhi, Puducherry and J&K**. Ladakh has **no legislature**.

Option	What It Offers	Where It Applies
Sixth Schedule	Autonomous District Councils with legislative, judicial and financial powers	Assam, Meghalaya, Tripura, Mizoram
Article 371	Region-specific safeguards on governance, land and customs	12 States
Statehood	A full State legislature and government	Demanded by Ladakh

Significance

- The proposal reflects India's **asymmetric federalism**, which tailors governance to regional needs.
- It could give Ladakh's people a real **voice** over their land and resources.
- It may help protect Ladakh's **fragile ecology** and **distinct culture**.
- A stable and satisfied Ladakh is important for **national security** on sensitive borders.

Challenges

- The **absence of a draft** has deepened **mistrust** among local groups.
- **Manipur's experience** shows that safeguards mean little without **effective implementation**.
- Ladakh's groups also want control over **law and order**, which the Centre may resist.
- A special provision for one UT may trigger **similar demands** elsewhere.

Way Forward

- The Centre should share a **formal draft** and consult the **LAB and KDA** openly.
- The new body's powers should be **clearly defined** and backed by **adequate funds**.
- **Land and ecological protections** should be written into the provision itself.
- A clear **timeline** for implementation would help rebuild trust.

Conclusion

- The Article 371K proposal could give Ladakh a **meaningful share in self-governance** without full Statehood. Its success will depend less on the text and more on the **powers, funds and trust** that come with it.

Higher Judiciary: Integrity, Distinguished Jurists and the Collegium

Why in News

- Allegations against the **Rajasthan HC Acting Chief Justice** have raised concerns over **judicial accountability**.
- The **Collegium** recommended **three HC Chief Justices** for the Supreme Court, reviving the **Collegium debate**.
- A Supreme Court judge asked why the "**distinguished jurist**" route has **never been used**.

About the Collegium System

The **Collegium** is a **judge-led** system for recommending the **appointment and transfer** of judges. It is **not in the Constitution**, and evolved through Supreme Court judgments.

- The **Supreme Court Collegium** comprises the **CJI and four senior-most judges**.
- A **High Court Collegium** comprises the **Chief Justice and two senior-most judges**.
- If the Collegium **reiterates** a name, the government is **bound** to appoint that person.

Case	Key Holding
First Judges Case (S.P. Gupta) - 1981	"Consultation" with the CJI did not mean concurrence ; executive primacy
Second Judges Case - 1993	CJI primacy ; Collegium born (CJI + 2 judges)
Third Judges Case (Article 143 reference) - 1998	Collegium expanded to CJI + 4 judges
Fourth Judges Case (NJAC) - 2015	99th Amendment and NJAC Act, 2014 struck down for violating judicial independence

About the "Distinguished Jurist" Route

Article 124(3) allows three routes to the Supreme Court: a High Court judge for **5 years**, an advocate for **10 years**, or a person who is a "**distinguished jurist**" in the President's opinion. The Constitution **does not define** a distinguished jurist, and the route has **never been used**.

- The **42nd Amendment (1976)** allowed distinguished jurists to become **High Court judges**, but the **44th Amendment (1978)** removed this.
- Almost all Supreme Court judges come from **High Courts**. Only **11 advocates** have been elevated **directly from the Bar**.
- **Rule 49** of the Bar Council of India bars **salaried law teachers** from practising, which widens the gap between **academia and the courts**.

About Judicial Accountability

India lacks an **effective, time-bound mechanism** to investigate misconduct by sitting judges.

- The **Judges (Inquiry) Act, 1968** is outdated and rarely used.

- In **K. Veeraswami (1991)**, the SC held that even registering an **FIR** against a judge needs the **CJI's permission**.
- The **Judicial Standards and Accountability Bill, 2012** lapsed with the **15th Lok Sabha**.
- The **in-house inquiry procedure (1999)** lacks **statutory backing** and transparency.

Provisions

- **Article 124** deals with the **appointment** of Supreme Court judges, and **Article 217** with High Court judges.
- **Article 124(4)** and **Article 217(1)(b)** provide for **removal** through Parliament, where the Collegium has **no role**.
- **Article 222** allows **transfer** of judges between High Courts, and **Article 224** provides for **additional judges**.
- Supreme Court judges retire at **65** and High Court judges at **62**.

Significance

- **Judicial integrity** is central to public trust in the **rule of law**.
- The issue tests the balance between **judicial independence** and **accountability**.
- Using the jurist route could bring **academic expertise** and diversity to the Supreme Court.
- **Delays** in appointments affect **case pendency** and justice delivery.

Challenges

- The Collegium is criticised for **lack of transparency, no fixed criteria** and **no permanent secretariat**.
- The **Executive–Judiciary interface** causes delays and accusations of **selective approval**.
- The “**master of the roster**” power can be **misused** in case allocation.
- **Impeachment** is politically difficult and rarely succeeds.

Way Forward

- Revive an updated **Judicial Standards and Accountability Bill** with a time-bound complaints mechanism.
- Publish **objective criteria** for appointments, transfers and elevation.
- Give the **in-house inquiry procedure statutory backing** and fixed timelines.
- Finalise the **Memorandum of Procedure (MoP)** to reduce delays.

- Develop clear guidelines to make the **distinguished jurist** route usable.

Conclusion

- Judicial accountability in India remains an **unfinished constitutional project**. A **codified, transparent and time-bound** framework is needed to protect both **independence** and **integrity**.

Revising India's Model BIT: Investor Protection vs Regulatory Space

Why in News

- India is revising its **2015 Model Bilateral Investment Treaty (BIT)**, and the new draft will soon go to the **Union Cabinet**.
- The aim is to **revive FDI** and protect **Indian investments abroad**.
- Experts want more **parliamentary and public consultation** in the process.

About Bilateral Investment Treaties

A BIT is a **reciprocal** agreement to **promote and protect** investments between two countries. It is enforceable under **international law** and tracked by **UNCTAD**. Its standard protections are:

- **National Treatment:** foreign investors are treated on par with domestic ones.
- **Fair and Equitable Treatment (FET):** treatment in line with international law.
- **Protection from expropriation** without compensation.
- **Investor–State Dispute Settlement (ISDS):** investors can sue the host State through **international arbitration**.

Why India Overhauled Its Treaties in 2015

- **White Industries v. India (2011)** was India's **first adverse ISDS award**, linked to **delays in Indian courts**.
- The **Vodafone and Cairn** disputes arose from **retrospective tax**, which India scrapped in **2021**.
- By 2015, India faced about **17 BIT claims**, and it later **terminated** most of its older BITs.

Limitations of the 2015 Model

- It covered only **enterprise-based** investment and **excluded portfolio investment**.

- Investors had to use **Indian courts for 5 years** first, a major deterrent given judicial delays.
- It **removed the MFN clause** and narrowed FET.
- It excluded **taxation, subsidies, procurement, compulsory licences** and **national security**, giving the State wide discretion.
- As a result, India signed **very few BITs**, and investor confidence weakened.

The Democratic Deficit in Treaty-Making

Economic treaties affect citizens' **jobs, prices and regulatory space**, yet they are negotiated mainly by the **executive**, with little scrutiny.

- Treaty-making is an **executive power** under **Article 73**.
- **Article 253** lets Parliament make laws to **implement** treaties, even on **State List** subjects.
- India sought public comments on its draft in **2015**, but did not adopt all of the **Law Commission's 260th Report**.

Significance

- A balanced BIT can **revive FDI** and investor confidence.
- As a **capital exporter**, India needs protection for its companies abroad.
- Consultation makes treaties more **legitimate and durable**, and involving **States** strengthens **cooperative federalism**.

Challenges

- Balancing **investor protection** with the **right to regulate**.
- Easier arbitration may bring **more ISDS claims**.
- Without **faster courts and stable rules**, treaty reform alone may not attract investment.

Way Forward

- Build an **expert team**, and consult **industry, arbitrators and civil society**.
- Put the draft in the **public domain** and before **Parliamentary Standing Committees**.
- Pair treaty reform with **faster dispute resolution** and **stable tax policy**.

Conclusion

- India needs a BIT that protects investors **without weakening its right to regulate**. A **transparent, consultative** process will give the treaty lasting legitimacy.

Forest Rights and Gram Sabha Consent: A Weakening Safeguard?

Why in News

- The **Ministry of Tribal Affairs** has said that the **Forest Rights Act (FRA), 2006** contains **no provision for Gram Sabha consent** for diverting forest land.
- The **Committee on Public Undertakings (COPU)** has suggested that consent from only **70–75% of affected Gram Sabhas** should be enough.
- **Niyamgiri** in Odisha and **Muthanga** in Kerala are also back in the news over **tribal land rights**.

More on the News

- A **Parliamentary Committee** found that forest clearances take about **106 months** on average, mainly because of **Gram Sabha consent**.
- **NHPC** proposed that **70–75%** Gram Sabha approval should suffice for key projects like **Teesta-IV**.
- **Vedanta** has sought to **reopen bauxite mining** in **Niyamgiri**, **13 years** after the **Dongria Kondh** stopped it.

About the Forest Rights Act, 2006

- The **Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006** came into force in **December 2007**. It seeks to undo the **"historical injustice"** done to forest-dwelling communities whose rights were never recorded under **colonial-era forest laws**.

Key rights under the FRA:

- **Individual Forest Rights (IFR)** cover land cultivated or lived on by forest dwellers.
- **Community Forest Rights (CFR)** cover the use, management and protection of community forest resources.
- **Use rights** cover **minor forest produce**, grazing areas and pastoral routes.
- **Habitat rights** protect **Particularly Vulnerable Tribal Groups (PVTGs)**.

Role of the Gram Sabha

- The **Gram Sabha** is the foundation of the FRA process. It **initiates, receives and verifies** claims, and forwards them to the **Sub-Divisional and District Level Committees**.

- The FRA does not use the words “**Gram Sabha consent**”. However, rules under the **Forest (Conservation) Act, 1980** require the government to **settle FRA rights** and obtain a **Gram Sabha No-Objection Certificate (NOC)** before **Stage-II clearance**. The **Tribal Affairs Ministry** now says this is not its responsibility, which has blurred **accountability**.

Case Study: Niyamgiri Hills (Odisha)

- **Niyamgiri** lies in the **Eastern Ghats**, in Odisha’s **Kalahandi and Rayagada** districts.
- It is the sacred home of **Niyam Raja**, deity of the **Dongria Kondh**.
- The **Vamsadhara** rises here, and the area is an **Elephant Reserve (2004)**.
- It holds about **72–88 million tonnes** of **bauxite**.
- In **2013**, the Supreme Court let the **Gram Sabhas** decide on mining, and they **rejected it**, making Niyamgiri a landmark for **Gram Sabha power**.

Case Study: Muthanga (Kerala)

- **Muthanga** is part of the **Wayanad Wildlife Sanctuary**, within the **Nilgiri Biosphere Reserve**, India’s **first (1986)**.
- In **2003**, landless **Adivasis** occupied the area, demanding promised land. The case reflects the conflict between **conservation and tribal rights**. As **Kerala** has **no Fifth Schedule** area, tribal protection there rests mainly on the **FRA**.

Provisions

- **PESA Act, 1996** extends Panchayati Raj to **Fifth Schedule Areas**. It requires **Gram Sabha consultation** before land acquisition and mining licences.
- The **LARR Act, 2013** requires a **Social Impact Assessment** and the consent of affected families for certain acquisitions.
- The **Fifth Schedule** protects **Scheduled Areas** in most States, and the Governor can regulate **land transfers** there.
- The **Sixth Schedule** provides **Autonomous District Councils** in Assam, Meghalaya, Tripura and Mizoram.

Significance

- Gram Sabha consent is the strongest safeguard for **tribal self-governance and land rights**.
- It protects **forests and biodiversity** by giving local communities a voice.
- The **Niyamgiri** case showed how **participatory democracy** can shape development decisions.

- The debate reflects the wider balance between **development and environmental justice**.

Challenges

- A **70–75% threshold** would create a **new and weaker** standard not found in any law.
- **Unclear responsibility** between Ministries weakens implementation.
- **Long clearance delays** create pressure to dilute safeguards.
- **Weak recognition of CFR rights** leaves many communities without formal protection.

Way Forward

- Clarify **institutional responsibility** for the Gram Sabha NOC process.
- Speed up clearances through **better coordination**, not by diluting consent.
- Ensure **free, prior and informed consent** of affected communities.
- Strengthen the joint use of **FRA, PESA and LARR** to protect tribal land.
- Expand recognition of **Community Forest Rights** across States.

Conclusion

- Gram Sabha consent is the backbone of **tribal rights and participatory governance**. Faster clearances should come from **better administration**, not from diluting the safeguards that protect forest communities.

Notes -- Prelims Relevance

Personal Law vs Criminal Law: Marital Rape Exception and POCSO

Why in News

- The **Supreme Court** said it is for **Parliament** to decide whether **marital rape** should be made a crime (10 Sept).
- The **Delhi High Court** ruled that **Muslim personal law** cannot override the **POCSO Act** (27 Sept).

More on the News

- A bench led by **CJI Surya Kant** is hearing challenges to the marital rape exception in **Section 375 IPC**, now **Section 63 BNS**.

- The government wants the exception to continue until the Court rules on its **reasonableness**.
- In the Delhi case, a **16-year-old girl** married a **28-year-old man** in **December 2024** and later became pregnant.
- The man cited **Muslim personal law**, but the Court held that **POCSO applies to everyone**.

Key Facts

- The **marital rape exception** says intercourse by a man with his **own wife** is not rape, if she is above a set age: **15** under the **IPC**, now **18** under the **BNS**. The **J.S. Verma Committee (2013)** called it **regressive**.
- The **POCSO Act, 2012** defines a **child** as anyone **below 18**. It is **gender-neutral**, treats a child's **consent as irrelevant**, and provides **Special Courts** with **in-camera** trials.

Law	Key Age	Nature
Muslim personal law	Puberty traditionally relevant	Personal law
Prohibition of Child Marriage Act, 2006	18 for women, 21 for men	Statutory law
POCSO Act, 2012	Below 18 = child	Secular criminal law

Prelims Pointers

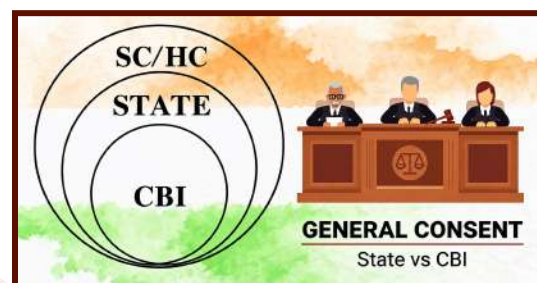
- **Section 63 BNS** has replaced **Section 375 IPC**, and the marital-exception age is now **18**.
- **POCSO** is **gender-neutral**, and sexual assault under it is **cognisable and non-bailable**.
- **Article 15(3)** allows the State to make **special provisions for children**.

Mains Angle

- The marital rape debate pits **bodily autonomy (Article 21)** against the **legislature's role** in defining crimes.
- Courts are wary of creating new criminal liability through interpretation, given **Article 20** protections.
- The **POCSO** ruling confirms that **personal law cannot override secular criminal law**.
- Together, the two cases show that **child and women's protection** must rest on **constitutional morality**, not custom.

Conclusion ; Both cases show that **personal law and tradition** cannot be used to deny **dignity and bodily autonomy** to women and children.

CBI General Consent



Why in News

- **Bihar** has issued a new notification under **Section 6 of the DSPE Act, 1946**, restructuring the **CBI's consent** to act in the State (6 Sept).

More on the News

- Under Bihar's order, the CBI has **general consent** to probe **Central government employees, Central PSU staff and private persons**.
- For **Bihar government employees** and staff of **State-owned bodies**, the CBI needs **case-by-case consent**.

Key Facts

The **CBI** has no separate law of its own. It functions under the **Delhi Special Police Establishment (DSPE) Act, 1946**. Since **police** is a **State subject**, the CBI needs a State's **consent** to investigate cases there.

- **General consent** means **blanket, standing permission** to investigate specified categories of cases.
- **Specific consent** means approval for each case separately.
- States such as **West Bengal, Kerala and Punjab** have **withdrawn** general consent.

The consent rule applies only to the CBI's **own decisions**. A **High Court or the Supreme Court** can order a CBI probe in any State **without its consent**.

Prelims Pointers

- **Police** is in **Entry 2 of the State List**, and the CBI's basis lies in **Entry 8 of the Union List**.

- **Entry 80 of the Union List** allows extension of police powers to another State **only with its consent**.
- The CBI was set up in **1963** by a **Home Ministry resolution**, on the **Santhanam Committee's** recommendation.
- Courts can order CBI probes under **Articles 32 and 226** without State consent.

Mains Angle

- Withdrawal or restructuring of consent reflects tensions in **cooperative and competitive federalism**.
- States use consent to resist what they see as **politically motivated** Central probes.
- A **statutory framework** for the CBI could reduce dependence on State consent.

Conclusion ; The consent system shows how federalism shapes even India's criminal investigation architecture.

Navodaya Schools in Tamil Nadu and the Language Formula

Why in News

- The Supreme Court directed **Tamil Nadu** to identify land for a **Jawahar Navodaya Vidyalaya (JNV)** in every district within **three months**.
- Tamil Nadu said it would keep its **two-language policy** and **not provide land**.

More on the News

- The Court stressed **cooperative federalism** and suggested **Tamil** could be taught as the **second language** in JNVs.
- It asked the **Centre and State** to discuss the language issue.
- The case arises from a **2017 Madras High Court** order directing JNVs in all districts.
- **Tamil Nadu** is the **only State** in India **without a JNV**.

Key Facts

JNVs were introduced under the **National Policy on Education, 1986** to give quality education to talented children, especially from **rural areas**. They are run by the **Navodaya Vidyalaya Samiti** under the **Ministry of Education**. They are **free, co-educational, residential** schools for **Classes VI to XII**, affiliated to the **CBSE**.

- **75%** of seats are reserved for **rural students**.

- Under the **migration scheme**, about **30%** of Class IX students are exchanged between **Hindi and non-Hindi** regions.
- States usually provide around **30 acres** of land **free of cost**.

The **three-language formula** combines the mother tongue or regional language, **English**, and one more Indian language. **NEP 2020** requires two of the three to be **native Indian languages**, but gives States **flexibility**. Tamil Nadu has followed a **two-language policy** (Tamil and English) since the **anti-Hindi agitations of the 1960s**.

Prelims Pointers

- **Education** moved to the **Concurrent List (Entry 25)** through the **42nd Amendment, 1976**.
- Under **Article 254(2)**, a State law that conflicts with a Central law on a Concurrent subject survives only with **Presidential assent**.
- **Article 351** directs the Union to promote **Hindi**, but it is **not legally enforceable**.
- **Article 350A** provides for **mother-tongue instruction** at the primary stage for linguistic minorities.

Mains Angle

- The case pits **national integration goals** against **State autonomy** in education.
- A **writ of mandamus** may not compel a State to join an **optional Central scheme**.
- **NEP 2020's flexibility** offers room for a compromise, such as **Tamil as the second language**.

Conclusion ; The Navodaya dispute shows that education policy in a diverse federation needs **negotiation and flexibility**, not compulsion.

Water Federalism: River-Linking, the Sone MoU and the Kishau Project

Why in News

- At the **Southern Zonal Council** meeting, the Union Home Minister proposed linking the **Brahmaputra, Godavari and Cauvery**.
- **Bihar and Jharkhand** signed an MoU ending their **25-year dispute** over **Sone** river water.
- Six States agreed to implement the **Kishau Multipurpose Project** on the **Tons River** after an **eight-year deadlock**.

More on the News

- The **Pennaiyar dispute** between Tamil Nadu and Karnataka still has **no tribunal**, despite a Supreme Court direction in **February 2026**.
- Kerala** opposes the **Pamba–Achankovil–Vaippar** link, fearing damage to the **Vembanad** wetland, a **Ramsar site**.

Key Facts

- River-linking:** The **National Perspective Plan (1980)** identified **30 links (16 Peninsular, 14 Himalayan)**. The **Ken–Betwa** link is the **only one** under implementation, and faces protests over **displacement** and the submergence of part of **Panna Tiger Reserve**. Critics say India needs **water conservation** and **groundwater control** instead.
- Sone River:** It rises near the **Amarkantak Plateau** and **flows north**, joining the **Ganga** near **Patna** as a **right-bank tributary**. Its main tributaries are the **Rihand** and **North Koel**.
- Kishau Project:** A **232.6-m dam** on the **Tons**, the **Yamuna's largest tributary**, on the **Himachal–Uttarakhand border**. It will generate **422 MW**, irrigate about **97,000 ha** and add **Upper Yamuna storage**. A **National Project** since **2008**, it will displace about **5,500 people** in **17 villages**.

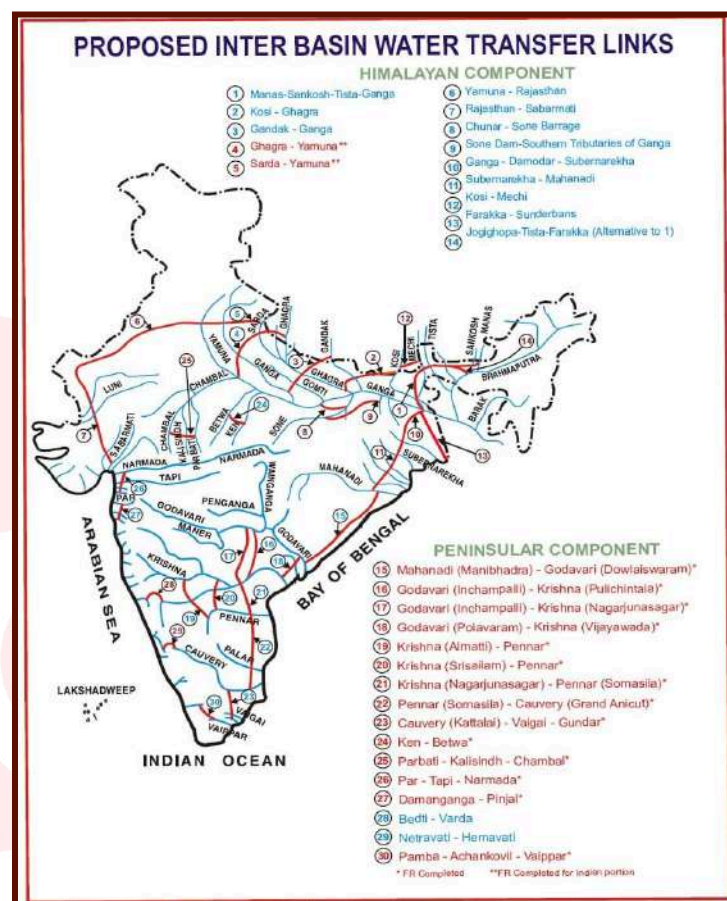
Prelims Pointers

- Article 262** lets Parliament provide for the adjudication of inter-State river disputes and **bar courts' jurisdiction** over them.
- Water** is in **Entry 17 of the State List**, while **inter-State rivers** fall under **Entry 56 of the Union List**.
- The **Inter-State River Water Disputes Act, 1956** provides for tribunals, and its **2002 amendment** set time limits.

Mains Angle

- The **Sone and Kishau** agreements show that **negotiated, Centre-facilitated** settlements can work.
- Delays in tribunal formation**, as in the **Pennaiyar** case, weaken trust in the legal route.
- River-linking carries **ecological, financial and displacement** costs that are often underestimated.
- Water conservation and cooperative federalism** offer more sustainable long-term solutions.

Conclusion ; India's water disputes need **cooperation, conservation and timely adjudication** more than large engineering projects.



PART C : INTERNATIONAL RELATIONS

Full Articles - Mains Relevance

West Asia on the Brink: Iran War, Hormuz and the Red Sea Crisis

Why in News

- The **US–Iran war** has intensified, and Iran has **restricted shipping** through the **Strait of Hormuz**.
- Iran-backed **Houthis** struck **Saudi oil facilities** and seized the **Bab el-Mandeb Strait**.
- India faces risks to its **energy, diaspora and trade routes**.

About the Conflict

- The conflict stems from US–Iran disputes over Iran's **nuclear programme, proxies and sanctions**.
- US pressure has led Iran to **widen** the conflict, reflecting the **security dilemma**, where one side's security moves trigger a **cycle of escalation**.

The Houthi Factor

- The **Houthis (Ansar Allah)** are a **Zaydi Shia** group from northern Yemen and part of Iran's "**Axis of Resistance**". They took **Sana'a** in **2014** and agreed to a ceasefire in **2022**.
- That truce ended after **Saudi-backed** strikes on **Sana'a airport**, and the Houthis then seized Yemen's **Red Sea coast**, the ports of **Mokha and Dhubab**, and **Perim Island**. Saudi Arabia shut its **East–West Pipeline** after drone attacks.

The "Two Chokepoints" Problem

- With **Hormuz** and **Bab el-Mandeb** both under pressure, ships must go around the **Cape of Good Hope**, raising **freight, insurance and inflation**.
- Oman has offered India **Sohar Port**, which lies **outside Hormuz** and handles **72 MT** a year, besides **Duqm and Salalah**.



India's Stakes

- **Energy:** The Gulf is India's largest source of **crude and LNG**.
- **Diaspora and remittances:** About **9 million** Indians live in the **GCC**, including **3.5 million** in the **UAE**.
- **Trade:** Exports to Europe pass through the **Red Sea and Suez**.
- **Connectivity:** **Chabahar** and the **INSTC** depend on ties with **Iran**.

India's Security Role

- India follows **multi-alignment** in West Asia.
- The **Makkah Joint Defence Agreement** and a shrinking US role are pushing it towards a more **active security role**.
- Its record includes **Operation Sankalp (2019)**, the **MV Ruen rescue (2024)** and the **SAGAR–MAHASAGAR** vision.

Significance

- It tests India's **strategic autonomy** across Iran, Israel, the Gulf and the US.
- It exposes India's **energy vulnerability** to chokepoints.
- It offers a chance to prove India's role as a **net security provider**.

Challenges

- A **multi-front** conflict makes **de-escalation** harder.
- High **oil prices** threaten **inflation** and the **import bill**.
- India risks being **drawn into rivalries**, while its **naval capacity** is stretched.

Way Forward

- **Diversify** crude sources and expand **strategic reserves**.
- Develop **alternative routes**, such as **Sohar** and **IMEC**.
- Keep **balanced** ties, and strengthen **naval** evacuation and escort capacity.

Conclusion

- Regional rivalries in West Asia can quickly become **global economic threats**. India must cut its **energy vulnerability** and play a **calibrated security role**, without giving up **strategic autonomy**.

Pakistan's Gulf Pivot: Strategic Depth or Strategic Overstretch?

Why in News

- Pakistan and **Kuwait** signed the **Protocol Agreement-2026** on **27 August 2026** to deepen **defence cooperation**.
- The deal follows the **Makkah Joint Defence Agreement** with **Saudi Arabia and Türkiye**, which includes a **collective-defence clause**.



More on the News

- Under the Kuwait pact, Pakistan will help with **military training, capacity building and border management**.
- The **Makkah Agreement**, signed on **7 August 2026**, treats an attack on one member as an **attack on all**, much like **NATO's Article 5**.
- Pakistan is also positioning itself as a **mediator between Iran and the US**.
- Together, these moves mark Pakistan's most **formal and rapid** security expansion in the Gulf in decades.

About Pakistan's West Asia Policy

- Since **1947**, Pakistan has sought a dual identity as a **South Asian state** and a voice of the **Muslim world**.
- In the Cold War, it joined **CENTO** and the **Regional Cooperation for Development** with **Iran and Türkiye**.
- After losing **East Pakistan (1971)**, it leaned on its **Islamic identity**, marked by the **1974 Lahore Islamic Summit**. It built deep ties with **Saudi Arabia** and the Gulf, supplying **troops** in return for **money and support on Kashmir**.

What Has Changed in 2026

- The ties are now **faster, larger and formal**. Pakistan wants to be **Saudi Arabia's security partner**, **Türkiye's ally**, **Iran's friend** and a **US go-between** at once, and its **nuclear status** adds to its appeal.

The Core Contradiction

Pakistan's many commitments may **clash** when tensions rise. If **Saudi Arabia** goes to war with the **Iran-backed Houthis**, Pakistan would face a hard choice:

- Supporting **Riyadh** would damage its ties with **Iran**.
- Staying **neutral** would weaken its credibility under the **Makkah Agreement**.

This is a classic case of **alliance entrapment**.

Implications for India

- **Potential challenge:** Gulf funding, Turkish technology and diplomatic support on **Kashmir** could make Pakistan more **resilient** against India.
- **Potential relief:** Pakistan stretched across **Iran, the Gulf, Yemen and the Red Sea** may have **less bandwidth** to focus on India.
- **Security risk:** Instability in West Asia may increase **radicalisation, terror financing** and support for **proxy groups**.
- **India's advantage:** India's **independent ties** with the **Gulf states**, built on energy, trade, remittances and counter-terrorism, are unlikely to be sacrificed for Pakistan.

Significance

- The case shows how **middle powers** combine **religious identity** with **hard security** cooperation.
- It illustrates the **entrapment risk** of collective-defence alliances.
- It highlights the value of **diversified partnerships**, as India has with the Gulf.
- It reflects the fragility of West Asia's **security order**.

Challenges

- Pakistan risks being forced to **choose between Saudi Arabia and Iran**.
- Multiple overseas commitments may **stretch** its limited military and economic resources.
- Failing to honour the **collective-defence clause** would hurt its **credibility**.
- For India, **China's support** for Pakistan adds another layer of concern.

Way Forward

- Deepen **bilateral defence, trade and energy** ties with **Saudi Arabia, the UAE, Qatar, Oman and Kuwait**.
- Strengthen **counter-terrorism and intelligence cooperation** with Gulf partners.
- Push **IMEC** and other connectivity projects that reduce dependence on any single power.

- Maintain **balanced engagement** with both the **Gulf states and Iran**.
- Track how the **Makkah Agreement** works in practice, if it is ever invoked.

Conclusion

- Pakistan's Gulf pivot may increase its **regional influence**, but it also creates **conflicting commitments**. India's best response is to strengthen its own **independent partnerships** in the Gulf, rather than react to Pakistan's moves.

India–China: Early Harvest Talks, Modi–Xi Meeting and the Pakistan–China Boundary

Why in News

- At the **25th Special Representatives' talks** (Beijing), India and China agreed to seek an **"Early and Substantial Harvest"** on the boundary.
- **PM Modi and President Xi** met at the **BRICS Summit**, agreeing that **"differences should not become disputes"**.
- India rejected the **Pakistan–China Boundary Commission** as having **"no legal basis"**.

About the India–China Boundary

- **Western Sector (Ladakh–Aksai Chin):** About **38,000 sq km** is under **Chinese control**.
- **Middle Sector (Himachal–Uttarakhand):** The **least disputed**, with small pockets like **Barahoti**.
- **Sikkim Sector:** Based on the **Anglo-Chinese Convention, 1890**.
- **Eastern Sector (Arunachal Pradesh):** China claims about **90,000 sq km** and rejects the **McMahon Line (1914)**.



Key Outcomes

- **Terms of Reference** will be finalised for the new groups.
- The **Kailash Mansarovar Yatra** and **border trade** will continue.
- **River data sharing** will be discussed in **September 2026**.
- Both sides reaffirmed the **2005 Agreement on Political Parameters**.

India Rejects the Pakistan–China Commission

- The MEA said **"there is no boundary between Pakistan and China"**, since the area is **Indian territory** under illegal occupation.
- Pakistan ceded the **Shaksam Valley** to China in **1963**, and India also opposes **CPEC**, which passes through **PoK**.

Concerns over "Early Harvest"

- **Package principle diluted:** Article III of the **2005 Agreement** calls for an **all-sector** settlement.
- **Sikkim ambiguity:** The **1890 Convention** names both the **watershed** and **Mount Gipmochi**, which China uses to push the trijunction south.
- **Siliguri risk:** A southern shift brings China closer to the **20–22 km** wide **"Chicken's Neck"**.
- **Bhutan angle:** A hasty deal could weaken India's position on **Doklam**.
- **Rivers ignored:** The outcomes are silent on the **Yarlung Zangbo dam**.

Significance

- The talks restore **momentum** after **Galwan (2020)**.
- **Hotlines** reduce the risk of **accidental clashes**.
- Pilgrimages and trade build **practical trust**.

Challenges

- A **piecemeal deal** may mean **unequal concessions** by India.
- **Trijunctions** need **Bhutan's** involvement.
- The **trade deficit** and **China–Pakistan** ties deepen distrust.

Way Forward

- Apply the **watershed principle** consistently, and keep **trijunctions** out of bilateral deals.

- Protect the **2005 Agreement** and push for **river data sharing**.
- Keep building **border infrastructure** alongside dialogue.

Conclusion

- The renewed India–China dialogue is a welcome step towards **peace on the border**. However, progress must not come at the cost of India's **strategic depth** around the **Siliguri Corridor**, **Bhutan's security** or India's **water security**.

US Sanctions Act on Russian Oil: India's Energy Security and Strategic Autonomy



Why in News

- US President **Donald Trump** signed the **Sanctioning Russia and Iran Act, 2026**.
- It allows tariffs of up to **100%** on the **top five buyers** of Russian oil and gas, including **India and China**.

About the Act

- The Act aims to cut **Russia's war revenue** by targeting its **leaders, banks, energy sector** and **"shadow fleet"**.
- It works through the **IEEPA**, allows tariffs of up to **500%** on direct imports from Russia, and extends the **Iran Sanctions Act** by **five years**.

Why India Is in the Frame

India imports about **85–88%** of its crude, and cheap Russian oil has helped control **inflation**. Its past record under US pressure:

- **Russia:** Its share fell from **30–40%** to **19.3%** (February 2026) after a **50% tariff**, then rose to **51%** (July 2026).
- **Venezuela:** Its share fell from **6.7% (2017–18)** to **zero**, and now stands at **4.8%**.
- **Iran:** Its share fell from about **10%** to **zero**, and now stands at **1.1%**.

After the **US Supreme Court** struck down Trump's **IEEPA tariffs** in **February 2026**, Indian refiners bought **even more** Russian crude.

Possible Impact on India

- **If India keeps buying:** **Exports** to the US may suffer; export growth fell from **18%** to **3.8%** after the last tariff.
- **If India cuts imports:** Replacing supplies with **Hormuz** disrupted and oil above **\$100** would raise **fuel prices**.
- **Trade talks:** The Act could be used as **leverage** in India–US negotiations.

Key Concepts

- **Secondary sanctions** punish **third-country** firms for dealing with a target, which is India's risk.
- **UN Chapter VII** sanctions bind all members, while **US sanctions** are **unilateral**.
- **CAATSA Section 231** targets **defence deals** with Russia.
- The **G7 price cap** limits Russian oil to **\$60** a barrel.
- A **shadow fleet** is a set of old tankers with **hidden ownership**.

Significance

- It tests India's **strategic autonomy**.
- It links **energy security** with **trade policy**.
- It exposes the risk of **over-dependence** on one supplier.

Challenges

- **High oil prices** leave few cheap alternatives.
- **Secondary tariffs** could hurt **export jobs**.
- India has given in to US pressure before, on **Iranian and Venezuelan oil**.

Way Forward

- Seek a **presidential waiver** through diplomacy.
- **Diversify** crude sources, and expand **strategic reserves** and **renewables**.
- Conclude the **India–US trade agreement**.

Conclusion

- The Act puts India between its **energy needs** and its **trade interests**. A mix of **diplomacy, diversification and domestic energy capacity** offers India the best way to protect its **strategic autonomy**.

India–Japan Defence Partnership: From Strategic Convergence to Operational Capability

Why in News

- Japan's Defence Minister **Shinjiro Koizumi** visited India in **August 2026** to deepen **defence cooperation**.
- Talks covered **maritime information sharing, joint shipbuilding** and the **UNICORN** antenna system.
- Japanese **fighter jets** joined **Exercise Veer Guardian** in India for the **first time**.

About the Partnership

India and Japan have built strong institutions, including the **2+2 Dialogue**, joint exercises and a **logistics agreement**, and share a vision of a **free, open Indo-Pacific**. However, **operational cooperation** has lagged behind political agreement, and the visit aimed to close this gap.

Key Areas of Cooperation

- **Maritime Domain Awareness:** Japan watches the **East China Sea and Taiwan**, India the **Indian Ocean**, together building a **continuous maritime picture**.
- **Shipbuilding:** **Joint design and production**, combining Japanese technology with **Make in India**.
- **Technology transfer:** **UNICORN** is the **first defence equipment transfer**, co-developed with **BEL** under a **2024 MoU**.
- **Research:** Closer **DRDO–ATLA** links.
- **Exercises:** Fighter jets in **Veer Guardian** mark a step towards **interoperability**.

Provisions and Frameworks

- The **2015 Agreement on Transfer of Defence Equipment and Technology** is the legal basis for transfers.
- The **2+2 Dialogue** brings together the **foreign and defence ministers**.
- The **July 2026 Annual Summit** widened ties to **economic security** and **supply chains**.
- Both are **Quad** members, with the **US and Australia**.

Significance

- It gives India **advanced technology** and reduces dependence on a **single supplier**.

- It supports **defence indigenisation** and the **Act East Policy**.
- Better **MDA** protects India's **energy and trade routes**.

Challenges

- **Slow implementation:** The 2015 agreement took nearly **a decade** to yield its first project.
- **Different priorities:** Japan focuses on the **East China Sea**, India on the **Indian Ocean** and **land borders**.
- **Bureaucratic hurdles** and the need to avoid provoking **China**.

Way Forward

- Set **time-bound milestones** for shipbuilding and technology projects.
- Move to **real-time intelligence sharing** and regular **joint exercises**.
- Link defence ties with **semiconductors, critical minerals** and **supply chains**.

Conclusion

- The India–Japan partnership is at a **turning point**. Its success will depend less on **new declarations** and more on the **speed of implementation** in shipbuilding, technology transfer and joint exercises.

Transboundary Rivers: The Indus Waters Treaty Ruling and China's Yarlung Zangbo Dam

Why in News

- The **Permanent Court of Arbitration (PCA)** ruled that the **Indus Waters Treaty (IWT)** remains in force. India rejected the ruling.
- China is going ahead with its mega-dam on the **Yarlung Zangbo (Brahmaputra)**, despite fresh concerns about glacial floods.

More on the News

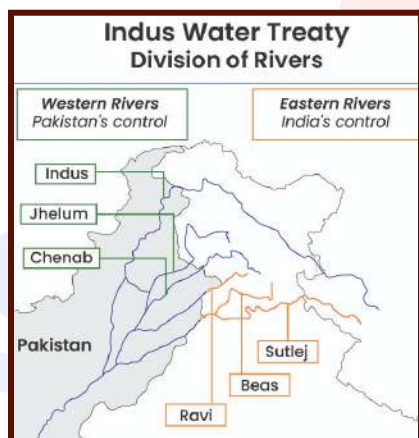
- India called the **Court of Arbitration** illegal and said it has no jurisdiction.
- India has kept the IWT “**in abeyance**” since the **Pahalgam attack (22 April 2025)**.
- A **glacial collapse and flash flood** on the Nepal–China border on 26 August raised new concerns about the safety of Himalayan dams.
- China has included the dam in its **15th Five-Year Plan**.

About the Indus Waters Treaty

The IWT was signed in **1960 in Karachi** by **Nehru and Ayub Khan**. The **World Bank** brokered it and also signed it.

- **Eastern rivers (Ravi, Beas, Sutlej):** India can use them without restriction.
- **Western rivers (Indus, Jhelum, Chenab):** These are mainly for Pakistan. India is allowed limited **non-consumptive use**, including **run-of-the-river hydropower**.
- **Dispute mechanism (three tiers):** the **Permanent Indus Commission** handles routine issues, a **Neutral Expert** decides technical differences and a **Court of Arbitration** decides legal disputes.

The current dispute is over the **Ratle and Kishanganga** projects. India prefers the **Neutral Expert**, whose decision is expected by **July 2027**, and has never recognised the Court of Arbitration. Even so, the Court, chaired by **Prof. Sean D. Murphy**, imposed interim measures on the **Ratle dam wall**.



About China's Yarlung Zangbo Dam

The river becomes the **Siang** in Arunachal Pradesh and the **Brahmaputra** in Assam. China is building the dam near the "**Great Bend**", just before the river enters India, and calls it the "**project of the century**".

- **Capacity:** about **60 GW**, with an expected output of **300 billion kWh** a year. That is more than **three times the Three Gorges Dam**.
- **Design:** China calls it a run-of-the-river project, but it includes a **reservoir near Mainling** and a **40-km diversion tunnel**.
- China's earlier **Zangmu dam (2010)** on the same river already supplies about **26% of Tibet's electricity**.



India's Concerns

- **Downstream flow:** It is unclear how much water China will store or divert.
- **Seismic risk:** The dam is being built in a highly earthquake-prone zone.
- **Data sharing:** China's data sharing under the **Expert-Level Mechanism** has been irregular.
- **Strategic leverage:** As the **upper riparian**, China controls a river that is vital to India's Northeast.

Provisions and Institutions

- The **PCA** was set up in **1899** and sits in the **Peace Palace, The Hague**. It is **not a UN body** and is different from the ICJ.
- "**Abeyance**" means a temporary pause, not termination. The IWT has **no unilateral suspension clause**.
- India and China have **no water treaty**. They only have **MoUs on sharing flood-season data**.
- The **UN Watercourses Convention (1997)** [S] sets rules for shared rivers, but neither India nor China has joined it.

Significance

- These cases show India's **dual position**: it is the upper riparian towards Pakistan and the lower riparian towards China.
- India's IWT stand links **water with national security and terrorism**.
- Both cases test the limits of **international law on shared rivers**.

Challenges

- Pakistan may use India's rejection of arbitration to portray India as ignoring treaty obligations.
- The treaty itself gives **no clear legal basis** for suspending the IWT.
- India has **little leverage over China** because there is no binding treaty.
- **Climate change** is making floods and glacial bursts more likely.

Way Forward

- India should pursue the IWT dispute through the **Neutral Expert** route.
- India should use its full share of the **eastern rivers** and speed up projects on the western rivers within treaty limits.
- India should push China for a **binding data-sharing mechanism** on the Brahmaputra.
- India should build **counter-storage** in Arunachal, such as the **Upper Siang project** [S], and strengthen **early-warning systems**.

Conclusion

- India's river diplomacy must balance **security concerns** with respect for **international norms**. Full use of its **IWT rights** and a stronger **data-sharing** framework with China are key to India's **water security**.

Notes - Prelims Relevance

India-Sri Lanka: Defence Minister's Visit, L70 Guns MoU and SLINEX-26

Why in News

- Defence Minister **Rajnath Singh** visited Sri Lanka from **8 to 10 September 2026**. It was the first visit by an Indian Defence Minister in nearly **40 years**.
- The **13th SLINEX** naval exercise was held at **Visakhapatnam** in September.

More on the News

- Three **MoUs** were signed.
 - One covers upgrading the **L70 guns** of the Sri Lankan Air Force.
 - The other two cover cooperation between the two countries' **NCCs** and **National Defence Colleges**.
- Sri Lanka assured India that its territory will **not be used against India's security interests**.
- The two sides also discussed **drug trafficking** and the **Palk Strait fisheries** issue.
- India sent **INS Kavaratti** and **INS Jyoti** to SLINEX. Sri Lanka sent **SLNS Sindurala**.

Key Facts

- The visit follows up on **PM Modi's 2025 visit** to Sri Lanka, when seven MoUs were signed, including an overarching **defence cooperation MoU**.

- After **Cyclone Ditwah (2025)**, India was among the first responders through **Operation Sagar Bandhu**.
- SLINEX** began in **2005** and is held in the two countries by turns. The two armies hold a separate exercise, **Mitra Shakti**.
- Ties are guided by India's **Neighbourhood First** policy and the **MAHASAGAR** vision (Mutual and Holistic Advancement for Security and Growth Across Regions). **MAHASAGAR** builds on **SAGAR**, which was announced in Mauritius in **2015**.

Prelims Pointers

- SLINEX** is a **naval** exercise, while **Mitra Shakti** is an **army** exercise between India and Sri Lanka.
- The **L70** is an **anti-aircraft gun**.
- Both countries are members of the **Colombo Security Conclave**, along with the **Maldives** and **Mauritius**.
- Operation Sagar Bandhu** was India's relief mission after **Cyclone Ditwah**.

Mains Angle

- Sri Lanka's location near major **Indian Ocean sea lanes** makes it vital to India's security.
- India's **economic and disaster support** has rebuilt trust in recent years.
- Sri Lanka's **security assurance** addresses concerns over **Chinese presence** in the region.
- The **fisheries dispute** remains a recurring irritant that needs a lasting solution.

Conclusion ; Closer defence ties show India's growing role as Sri Lanka's **first responder** and **preferred security partner**.

Greenland and the Arctic: The US-Denmark-Greenland Security Deal



Why in News

- On **18 September 2026**, the US, Denmark and Greenland announced a **security deal** that allows a larger **US military presence** in Greenland.
- The deal bars rival powers such as **China and Russia** from setting up bases there.

More on the News

- The US gets **permanent access, basing and overflight rights**, and may add more bases.
- Only **NATO countries** may build bases in Greenland. Adversaries face limits on **sensitive investments**.
- The deal stops short of President Trump's earlier demand for **US ownership** of Greenland.
- It will be signed at the **UN General Assembly** and needs **parliamentary approval**.

Key Facts

- Greenland** is the world's **largest island**, covering about **2.17 million sq km**, and is about **80% ice-covered**. It is an **autonomous territory of Denmark**, with its capital at **Nuuk**. Most of its population of about 56,000 is **Inuit**.
- It got **Home Rule in 1979** and **self-government in 2009**. The 2009 Act recognises its **right to independence** through a referendum.
- Greenland controls its **natural resources**. Denmark handles **foreign affairs, defence and monetary policy**.
- It joined the EU with Denmark in **1973** but left in **1985** over fishing quotas.
- The US already runs the **Pituffik Space Base** (formerly Thule Air Base) under a **1951 defence agreement**.

India's Arctic Link: India signed the **Svalbard Treaty (1920)** and set up the **Himadri station (2008)**. It became an **Arctic Council observer in 2013** and released its **Arctic Policy in 2022**. The nodal agency is **NCPOR, Goa**.

Prelims Pointers

- Greenland is separated from **Canada** by **Baffin Bay** and the **Davis Strait**, and from **Iceland** by the **Denmark Strait**.
- The **Arctic Council** was set up by the **Ottawa Declaration (1996)** and is headquartered in **Tromsø, Norway**.
- The Arctic Council has **eight members** and does **not deal with military security**.
- India's **Arctic Policy (2022)** has six pillars.

Mains Angle

- Melting Arctic ice is opening new **shipping routes** and access to **critical minerals**.
- The deal reflects rising **great-power rivalry** in the Arctic.
- Arctic changes affect India's **monsoon** and **sea levels**, making the region relevant to India.
- India's **observer status** gives it a voice in **Arctic science and governance**.

Conclusion ; The Greenland deal shows how the Arctic is becoming a new arena of **strategic competition**, with direct climate links to India.

Europe Outreach: Belgium, Germany and UK Carbon-Price Recognition

Why in News

- Belgian PM **Bart De Wever** visited India and signed **three defence agreements**. It was the first visit by a Belgian PM in two decades.
- India and Germany held the **4th Indo-German Environment Forum** in Delhi.
- The UK recognised India's **Carbon Credit Trading Scheme (CCTS)** under its **Carbon Border Adjustment Mechanism (CBAM)**.

Key Facts

- India–Belgium:** The three agreements are
 - Letter of Intent on defence cooperation**
 - MoU with **SIDM**, and
 - MoU between the **CBI and Belgium's Federal Police**.
- India–Germany:** The two countries marked **75 years of diplomatic ties** in March. PM Modi and Chancellor **Friedrich Merz** reaffirmed the **Partnership for Sustainable Green Development (2022)** in January.
- India–UK (CCTS):** The CCTS was notified under the **Energy Conservation (Amendment) Act, 2022**. It is run by the **Bureau of Energy Efficiency (BEE)** and builds on the **PAT scheme**. The **EU** was the first to introduce a **CBAM** and the **UK** is the second.

Prelims Pointers

- Brussels** hosts the headquarters of both the **EU** and **NATO**.
- The **Port of Antwerp-Bruges** is **Europe's second-largest port**, after **Rotterdam**.

- **CBAM** is a **carbon tariff** on carbon-intensive imports such as **steel, aluminium and cement**.
- The **BEE** works under the **Ministry of Power**.

Mains Angle

- Europe offers India **technology, investment and market access**, especially through the **India–EU FTA**.
- **Defence ties** with smaller European states diversify India's **defence partnerships**.
- The UK's recognition of the **CCTS** sets a **precedent** for India's talks with the **EU on CBAM**.
- **Green partnerships** support India's **Net Zero 2070** goal.

Conclusion ; India's European outreach is widening from trade to **defence, climate and green technology** partnerships.

SCO and Central Asia: Bishkek Summit and the Islamabad Meeting

Why in News

- PM Modi attended the **26th SCO Summit in Bishkek, Kyrgyzstan** (31 August–1 September 2026), which marked the SCO's **25th anniversary**.
- An Indian delegation attended the **SCO National Coordinators' meeting in Islamabad**. It was India's first official visit to Pakistan since **Operation Sindoor**.

More on the News

- At Bishkek, PM Modi stressed **connectivity, counter-terrorism** and closer ties with **Central Asia**.
- India signed an agreement with **Uzbekistan** for the **long-term supply of uranium**.
- **Pakistan** will host the **2027 SCO Summit**. **Türkiye** signalled interest in deeper engagement with the grouping.
- India stressed that the Islamabad meeting was **multilateral** and separate from its bilateral issues with Pakistan.

Key Facts

- The **SCO** grew out of the **Shanghai Five (1996)** and was founded on **15 June 2001** in Shanghai. Its **Charter** was signed in 2002 and came into force in 2003.

- Its **Secretariat** is in **Beijing** and its **RATS** is in **Tashkent**.
- It has **10 members**. **India and Pakistan** joined in **2017**, **Iran** in **2023** and **Belarus** in **2024**.
- Its official languages are **Russian and Chinese**. **Afghanistan and Mongolia** are observers.

Central Asia: The region covers **Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan**. India has **strategic partnerships** with all of them except **Turkmenistan**, which follows **permanent neutrality**. Because the region is landlocked, India relies on the **INSTC** and **Chabahar Port** for access.



Prelims Pointers

- India and Pakistan became **full SCO members** at the **Astana Summit (2017)**.
- The SCO's **RATS** is headquartered in **Tashkent**.
- **Turkmenistan** is the only Central Asian state **without** a strategic partnership with India.
- **Türkiye** is an **SCO Dialogue Partner [S]**.

Mains Angle

- The SCO gives India **direct access** to Central Asia and a platform on **counter-terrorism**.
- **China's dominance** and **Pakistan's membership** limit India's room in the grouping.
- **Connectivity gaps** remain India's biggest obstacle in Central Asia.
- Engaging in **Islamabad** shows India keeps **multilateral and bilateral** tracks separate.

Conclusion ; The SCO remains important for India's **Central Asia** outreach, despite its **China-centric** character and Pakistan's presence.

ASEAN and South-East Asia: AIMMAF, ADMM-Plus and the Philippines

Why in News

- India hosted the **9th ASEAN–India Ministerial Meeting on Agriculture and Forestry (AIMMAF)** in New Delhi on **9 September 2026**.
- INS Sahyadri** and **INS Kulish** took part in the **ADMM-Plus maritime security exercise** at **Subic Bay, Philippines**.

More on the News

- AIMMAF adopted the **ASEAN–India Medium-Term Plan of Action on Agriculture and Forestry (2026–2030)**.
- The plan focuses on **food security, climate-resilient farming** and **digital tools** such as AI and IoT.
- The ADMM-Plus exercise was hosted by the **Philippine Navy** and co-chaired by **Japan**.
- India also deepened defence ties with the **Philippines**, the **first foreign buyer of BrahMos**. **Malaysia** is exploring a purchase.

Key Facts

- AIMMAF (2021–25):** Achievements include a **Joint Leaders' Statement on food security**, the **ASEAN–India Millets Festivals (2023)** and the **ASEAN–India Fellowship (2024)**, which offers 50 Master's fellowships in agriculture. The **10th AIMMAF** will be held in **2028**.
- ADMM-Plus:** It brings together the **ASEAN members** and **eight dialogue partners**: India, Australia, China, Japan, New Zealand, South Korea, Russia and the US. It covers maritime security, counter-terrorism and disaster relief.
- ASEAN:** It was founded on **8 August 1967** through the **Bangkok Declaration**, and its **Secretariat** is in **Jakarta**.
- India–ASEAN ties** grew in stages: **Sectoral Partner (1992)** → **Dialogue Partner (1996)** → **Summit-level (2002)** → **Strategic Partnership (2012)** → **Comprehensive Strategic Partnership (2022)**.

Prelims Pointers

- ASEAN's **five founders** are **Indonesia, Malaysia, the Philippines, Singapore and Thailand**.
- ADMM-Plus** includes **eight non-ASEAN partners**, including **India**.

- India's **Look East Policy (1991)** became the **Act East Policy** in **2014**.
- The **Philippines** is the **first export customer** of the **BrahMos** missile.



Mains Angle

- ASEAN is the **core** of India's **Act East Policy** and its **Indo-Pacific** vision.
- Agricultural cooperation supports **food security** and **millets diplomacy**.
- Defence ties with the **Philippines** strengthen India's role in the **South China Sea** region.
- India supports **ASEAN centrality** in the regional security architecture.

Conclusion ; India's ASEAN engagement now spans **farm, food and defence** cooperation, deepening its **Act East** footprint.

A G2/G3 World: Great-Power Rivalry and the US–China AI Talks

Why in News

- After the **BRICS Summit**, analysts argue that global power is moving towards a **G2 (US–China)** or **G3 (with Russia)** order rather than true **multipolarity**.
- The US and China held their **first AI talks** in New York on **20 September**. **Xi Jinping** then visited Washington on **23 September**.

More on the News

- Both sides agreed to discuss **AI risks, benefits and national-security incidents**, and plan to meet again by **November**.

- They still differ on **basic terminology**, which limits progress on AI governance.
- China has proposed an **open-source AI community under BRICS**. India is unlikely to join the China-led **WAICO**.
- In **November 2024**, Biden and Xi agreed that **humans should keep control** over decisions to use nuclear weapons, but the commitment was never institutionalised.

Key Facts

- **Power concentration:** China now accounts for about **three-fifths of BRICS GDP**, up from less than half in 2006. The US accounts for about **three-fifths of G7 output**. A bigger grouping is not necessarily a more plural one.
- **G2 unlikely:** US–China disputes over **trade, technology and Taiwan** run deep, so their summits are about **managing rivalry**. A **G3** could emerge if a **Ukraine peace deal** brings a US–Russia thaw.
- **Weakening multilateralism:** US–China differences have blocked **G20 joint statements**. **BRICS, APEC and the G7** now serve mainly as venues for **bilateral talks**.

Prelims Pointers

- A **G2** refers to the **US and China** jointly shaping the global order.
- **Multi-alignment** means engaging several competing power centres at once.
- **Minilateralism** means cooperation in **small, issue-based groupings**.
- **WAICO** is a **China-led** AI cooperation body that India is unlikely to join.

Mains Angle

- **Multipolarity** is India's **goal**, but current trends point towards a **two-power** order.
- A tight US–China contest makes India a valued **“swing state”**.
- **AI rules** may be set by the two powers with most of the **compute**, leaving India a **rule-taker**.
- India needs **capability-backed** strategic autonomy, built on **chips, AI, energy and manufacturing**.

Conclusion ; In a G2-shaped world, India's influence will depend less on **forum membership** and more on its **own capabilities**.

Global Institutions Box

UNSC Veto Reform

In News: On **22 September**, French President **Emmanuel Macron** proposed **regulating the veto**, especially during **genocide and humanitarian crises**.

- The **UNSC** has **15 members: 5 permanent (P5) and 10 non-permanent** members elected for **two years**.
- The word **“veto”** does not appear in the **UN Charter**; it arises from the rule requiring the **concurring votes** of the P5 under **Article 27(3)**.
- The veto applies only to **substantive**, not **procedural**, matters.
- The **French–Mexican initiative (2015)** asks the P5 to **voluntarily avoid** using the veto in cases of mass atrocities.
- The **Liechtenstein initiative (2022)** requires the **UNGA** to meet within **10 working days** after any veto.

UNCLOS: The “Constitution of the Oceans”

In News: **Tommy Koh**, who led the **UNCLOS III** negotiations, won the **2026 Ramon Magsaysay Award**.

- UNCLOS was adopted in **1982** at **Montego Bay, Jamaica**, and came into force in **1994**. India ratified it in **1995**.
- The **territorial sea** extends to **12 nautical miles**, the **contiguous zone** to **24**, and the **EEZ** to **200**.
- **Innocent passage** applies in the **territorial sea**. **Transit passage** applies in **international straits** like **Hormuz** and **cannot be suspended**.
- Koh argued that transit passage is now customary law, binding even on non-parties like Iran.
- **ITLOS** sits in **Hamburg**, and the **International Seabed Authority** in **Kingston, Jamaica**.

“Correct the Map” Resolution

In News: The **UNGA** adopted the **“Correct the Map”** resolution on **4 September 2026**, backing the **Equal Earth** map projection.

- It was sponsored by **Togo** for the **African Group** and backed by the **African Union**.
- The vote was **164 in favour, 1 against (the US) and 6 abstentions**.
- It is **non-binding**, but its supporters call it a step towards **“cognitive justice”** for Africa.
- India objected to a **UN map** that showed **Arunachal Pradesh and Aksai Chin** as

disputed. It clarified that it voted only for the **projection**, not for any **boundary depiction** → See Part H for Mercator vs Equal Earth.

WHO Pandemic Agreement and PABS

In News: India's **Health Secretary** attended the **UN High-Level Meeting** on pandemic preparedness in **New York** on **25 September 2026**.

- The **WHO Pandemic Agreement** was adopted at the **78th World Health Assembly** on **20 May 2025**.
- It needs ratification by at least **60 countries** to enter into force.
- The **Pathogen Access and Benefit-Sharing (PABS)** system links **sharing pathogen samples** with **fair access** to vaccines and medicines.
- **India, Brazil and South Africa** support a **legally binding PABS** system.
- India promotes its **Digital Public Infrastructure**, such as **CoWIN**, as a **global public good**.

PART D : ECONOMY, AGRICULTURE AND INFRASTRUCTURE

Full Articles - Mains Relevance

Growth and Measurement: Q1 FY27 GDP, the New Series and Double Deflation

Why in News

- India's **real GDP** grew **7.8%** in **Q1 FY27** (April–June 2026), above the **RBI's forecast** of **7%**.
- **MoSPI** released the **National Accounts Statistics 2026** under the new **base year 2022–23**.
- The new GDP series uses **"double deflation"** and the **Producer Price Index (PPI)**, which has led to revisions in growth numbers.

About the New GDP Series

The **National Accounts Statistics 2026** were released with **2022–23** as the new **base year**. They revise growth to **7.3%** for **2023–24**, **7.2%** for **2024–25** and **7.8%** for **2025–26**. The series uses three new indices:

- **Producer Price Index (PPI):** It measures prices received by producers at the **factory gate**. It **replaces the WPI** as a price input.
- **Index of Industrial Production (IIP):** This has been rebased to **2022–23**.
- **Banking Services Price Index (BkSPI):** A new index that measures the real volume of **banking services**.

Single vs Double Deflation

To find **real GVA**, statisticians remove the effect of **inflation** using a **deflator**.

- Under **single deflation** (the old method), the **same price index** was used for both **inputs and outputs**. This works only when input and output prices **move together**.
- Under **double deflation** (the new method), **inputs and outputs** are adjusted **separately**, using their own price changes. This gives a more accurate picture when, for example, **crude oil** prices rise faster than the prices of finished goods.

The old method also relied on the **WPI**, which covers **only goods**. This led to errors in measuring the **services sector**. The **PPI** fixes this, since it excludes **taxes, trade margins and transport margins**.

Provisions and Concepts

- **GDP = GVA + Product taxes – Product subsidies**.
- **Nominal GDP** uses **current prices**, while **real GDP** uses **constant prices** after removing inflation.
- The **CPI** is compiled by the **NSO (MoSPI)**, while the **WPI** is compiled by the **Office of the Economic Adviser, DPIIT**.
- **GFCF** measures the creation of **physical assets** and indicates **investment health**.

Significance

- Strong growth confirms India's position as the **fastest-growing major economy**.
- The jump in **investment** signals rising **business confidence** and **capacity building**.
- **Double deflation** makes real growth figures **more accurate**, especially for **services**.
- An updated **base year** reflects the economy's **current structure**, including new sectors.

Challenges

- **Agricultural growth** has slowed, which may hurt **rural incomes and demand**.

- **Mining** contracted, partly due to a **high base**.
- Frequent **revisions** may create **confusion** about the true pace of growth.
- In some quarters, the **manufacturing deflator** turned **negative**, which complicates interpretation.

Way Forward

- Strengthen **agricultural productivity** to support **rural demand**.
- Sustain **public and private investment** in infrastructure.
- Improve **transparency** by publishing clear notes explaining **data revisions**.
- Strengthen **data sources** for the **informal sector**.

Make in India at 12: A Patchy Report Card

Why in News

- **Make in India**, launched on **25 September 2014**, completed **12 years**.
- New analysis shows that manufacturing has **not significantly raised** its share in **growth, jobs or global exports**.
- Separately, a **40.9% gap** between official and alternative estimates of **manufacturing GVA** has raised questions about measurement.

About Make in India

Make in India was launched to turn India into a **global manufacturing hub**. Its goals were to raise manufacturing's share in GDP, create **jobs**, and attract **foreign investment**. Twelve years later, official data on **GVA, IIP, exports and RBI statistics** show **mixed results**.

Performance Assessment

- **Growth:** Under the **old GVA series**, manufacturing outgrew the economy in only **6 of 12 years**. Under the **new series**, it did so in **all three years** since 2023–24, but the **gap is shrinking**.
- **Industrial output:** Under the **old IIP**, manufacturing outpaced the overall index in only **3 of 12 years**.
- **Exports:** **Non-petroleum goods exports** grew **53%**, from **\$253.5 billion** to **\$388.3 billion**. In the **12 years before** Make in India, they had grown by over **400%**, though from a smaller base.
- **Private investment:** **Private GFCF** as a share of GDP has been **falling since 2022–23**.

- **FDI:** Manufacturing's share in total FDI rose from about **48% to 55%**, though its growth was **slower** than overall FDI in **7 of 12 years**.
- **Capacity use:** RBI data shows **capacity utilisation** still **below 80%**, the level at which firms usually invest in **new capacity**.

The PLI Schemes

The **14 Production-Linked Incentive (PLI)** schemes launched in **2020–21** have attracted **₹2.4 lakh crore** of investment. However, about **83%** of it is concentrated in five sectors:

- **solar modules**
- **pharmaceuticals**
- **automobiles and components**
- **specialty steel**
- **large-scale electronics**

The Measurement Debate

The new NAS estimates **manufacturing GVA** at **₹38.6 lakh crore** for 2023–24, or about **14.7%** of GDP. An **alternative estimate** puts it at just **₹27.4 lakh crore**, a gap of **40.9%**. The difference arises from data sources:

- The **organised sector** is measured through the **Annual Survey of Industries (ASI)** and **MCA-21** company filings.
- The **unincorporated sector** is measured through **ASUSE**, and accounts for only **13.9%** of manufacturing GVA.

Significance

- Manufacturing is key to creating **mass employment** for India's young workforce.
- A strong manufacturing base is essential for **escaping the middle-income trap**.
- The assessment helps **refocus policy** on what has and has not worked.
- Accurate data is vital for **evidence-based industrial policy**.

Challenges

- Manufacturing's share remains **far below the 25% target**.
- **Private investment** remains weak despite incentives.
- **PLI gains** are concentrated in a few sectors and not spread across the economy.
- Rising **MSME credit** may be funding **working capital** rather than **new capacity**.

Way Forward

- Widen **PLI-type support** to **labour-intensive sectors** such as textiles, footwear and food processing.
- Improve **ease of doing business, logistics and power costs**.
- Strengthen **skilling** to match industry needs.
- Deepen **trade agreements** to integrate India into **global value chains**.
- Improve **data quality** to resolve gaps in manufacturing estimates.

Conclusion

- Make in India has produced **sectoral gains**, especially through PLI. However, it has not yet transformed India into a **manufacturing powerhouse**. Broad-based reforms, wider sectoral coverage and stronger **private investment** are needed to meet its goals.

The Middle-Income Trap, Skills and the Road to Viksit Bharat @2047



Why in News

- India is now the world's **fourth-largest economy**, but weak job creation, stagnant wages and low private investment have raised fears of a **middle-income trap**.
- In his Independence Day 2025 address, PM Modi renewed the vision of **Viksit Bharat @2047** and set out seven priorities, the "**Sapta Dhara**".

About the Middle-Income Trap

A country falls into this trap when it grows fast on **cheap labour** but fails to become an **innovation-driven, high-income economy**. As wages rise, its cost advantage fades, growth slows and **jobless growth** sets in. India shows some early signs of it:

- Productivity gains are confined to narrow, **capital-intensive** pockets.

- Firms compete by **cutting costs** rather than by innovating.
- **Capital is subsidised** relative to labour, even though India has surplus labour.
- **R&D spending** is only about **0.65% of GDP**.

The Social Roots of the Skill Deficit

India has long **underfunded mass education** while subsidising higher education. **Caste-based occupational hierarchy** also means that manual and technical work carries little prestige.

- India has about **14,000 ITIs**, but only **48%** of their seats are filled.
- Only **63%** of ITI graduates find jobs, compared with over 90% in skill-focused economies.
- Economist **Joel Mokyr** argues that growth depends on spreading "**useful knowledge**", which does not happen when a society undervalues practical skills.

About Viksit Bharat @2047

The vision is coordinated by **NITI Aayog** and aims to make India a **developed nation by 2047**. It builds on the **Panchpran (2022)** and **Amrit Kaal (2022–2047)**.

- **GDP:** from about **\$3.36 trillion** today to **\$30 trillion**.
- **Per capita income:** from about **\$2,400–2,800** to about **\$18,000**.
- **Required growth:** **7–10% a year** for 20–30 years.
- **Sapta Dhara:** manufacturing; agriculture and food processing; technology and innovation; infrastructure; defence self-reliance; the green and blue economy; and soft power.

Lessons from Other Countries

- **South Korea and China** escaped the trap by building institutions that spread **technical skills** widely.
- **Brazil, Argentina, Thailand and the Philippines** remained stuck.
- In **1980**, India's per capita income (**\$582**) was higher than China's (**\$307**). By 2000, China had pulled far ahead through its focus on **manufacturing**.

Significance

- India's **demographic dividend** could become a liability without quality jobs.

- **AI and automation** make skilling even more urgent.
- Raising **women's workforce participation** by 10 percentage points could add about **1 percentage point** to GDP growth.

Challenges

- **ITIs** are underused, and their courses do not match industry needs.
- **Social stigma** discourages young people from technical trades.
- **Low R&D** and weak state capacity hold back innovation.
- India's **demographic window** may begin to narrow around **2040**.

Way Forward

- Make **skilling** a central part of **industrial policy**.
- Restore **dignity and fair wages** to skilled manual work.
- Strengthen **industry-ITI partnerships and apprenticeships**.
- Raise **R&D spending** and correct the **capital-labour price distortion**.
- Support **women's participation** through safe transport, childcare and flexible work.

Conclusion

- India cannot rely on **cheap labour** and a few high-productivity sectors to become a developed nation. Achieving **Viksit Bharat** will require valuing **skills**, spreading **useful knowledge** and making growth **inclusive**.

Inflation Targeting at 10: Does the 4% Framework Fit India?

Why in News

- India has completed **10 years of Flexible Inflation Targeting (FIT)**, which it adopted in **2016**.
- New research finds that India's **Phillips Curve is flat** and that **household inflation expectations** remain high. Both findings raise doubts about the framework.

About Inflation Targeting

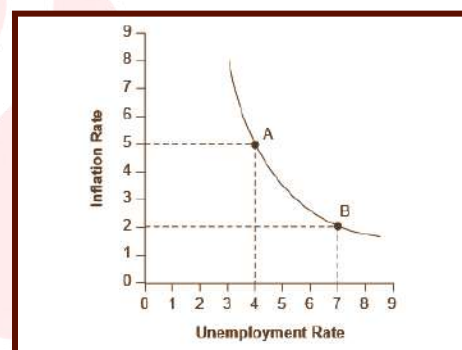
Under inflation targeting, the central bank keeps inflation within a pre-announced range, mainly by adjusting the **repo rate**. India adopted it through an **amendment to the RBI**

Act in 2016, which also created the **Monetary Policy Committee (MPC)**. The RBI works through two channels:

- **Demand channel:** A higher repo rate makes loans costlier, which reduces demand and, in theory, inflation.
- **Expectations channel:** If expectations are **anchored** near the target, inflation falls without hurting output.

The Phillips Curve Logic

The **Phillips Curve** links output and employment with inflation. When output rises, workers bargain for **higher wages**, and since prices are set as a markup over wages, inflation rises. Inflation targeting assumes that this link exists.



Why the Theory Does Not Fit India

- **Flat Phillips Curve:** About **92%** of workers are **informal** and have little bargaining power, so wages do not rise with output.
- **Unanchored expectations:** Household expectations stay about **4 points** above target, so the "painless" expectations channel is not working.
- **Supply-side inflation:** Much of India's inflation comes from **food, fuel and monsoon shocks**, which interest rates cannot control.

The result may be close to **"flat stagflation"**: higher rates cut output and jobs without lowering inflation by a matching amount.

Provisions and Institutions

- The **Government** sets the target in consultation with the RBI and **reviews it every five years**.
- The **MPC** has **six members**: three from the RBI, including the Governor, and three appointed by the Government.
- The **Urjit Patel Committee (2014)** recommended FIT.
- **CPI** is compiled by the NSO under MoSPI.

Significance

- The debate questions whether a framework designed for **advanced economies** suits India's **informal labour market**.
- It highlights the trade-off between **price stability** and **growth and jobs**.
- It is relevant to the upcoming **review of the inflation target**.

Challenges

- **Food and fuel inflation** lie largely outside the RBI's control.
- **High informality** weakens **monetary transmission**.
- Changing the target too often could hurt the RBI's **credibility**.

Way Forward

- Strengthen **supply-side management** through food storage, logistics and buffer stocks.
- Improve **expectation surveys** and **public communication**.
- Use the **five-year review** to reassess whether the 4% target fits India.
- Promote **formalisation** of the workforce so that monetary policy works better.

Prelims Pointers

- India adopted **Flexible Inflation Targeting** in **2016**.
- The target is **4% CPI inflation**, with a band of **2–6%**.
- The **MPC** was created through an **amendment to the RBI Act**.

Conclusion

- India's decade of inflation targeting shows that **one framework does not fit all economies**. A more **flexible approach**, combining monetary policy with **supply-side reforms**, would better protect both **price stability and growth**.

Farm Inputs and Crop Resilience: Sugarcane Red Rot and the Sulphur Shock

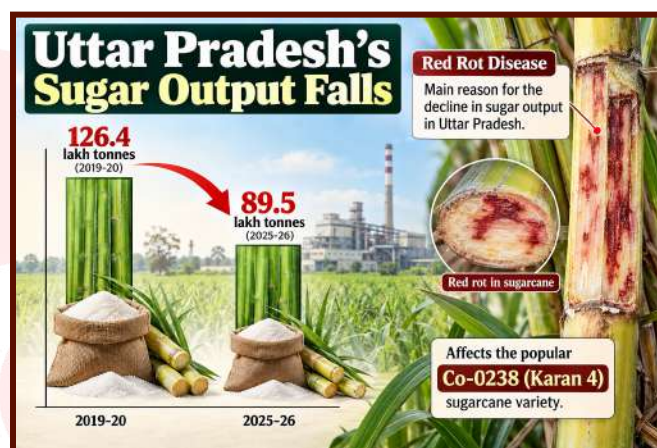
Why in News

- **Uttar Pradesh's sugar output** has fallen sharply because **red rot** has struck its most popular sugarcane variety, **Co-0238**.

- **Global sulphur prices** have risen nearly **four times** in a year, threatening the supply of phosphatic fertilisers such as **DAP** before the rabi season.

About the Sugarcane Crisis

Red rot is a **fungal disease** caused by *Colletotrichum falcatum*, and is often called the "**cancer of sugarcane**". It turns the inner tissue of the cane red, with white patches, and gives off a sour, alcohol-like smell. It spreads mainly through **infected setts**.



- **Co-0238**: It was released in **2009** by ICAR–SBI and made UP India's top sugar producer. Grown as a **monoculture**, it allowed the fungus to evolve a stronger **CF13 strain**, which caused **variatal breakdown**.
- **Co-20016**: It resists **CF13** and gives a higher yield (**144.6 t/ha** against 116.4) and higher **sucrose (18.7%)**. It awaits clearance from the **Central Varietal Release Committee**.

About the Sulphur Shock

About **92%** of the world's sulphur is a **by-product of petroleum refining** and gas processing, and **BS-VI norms** have increased its recovery. Sulphur is also a **secondary plant nutrient**, along with calcium and magnesium, and is vital for **oilseeds and pulses**.

How sulphur becomes fertiliser:

- Sulphur is converted to **sulphuric acid** through the **Contact process**, using a **V₂O₅ catalyst**.
- Sulphuric acid reacts with **rock phosphate** to make **phosphoric acid**, which is used to produce **DAP** and complex fertilisers. It is also used to make **SSP**.
- **Urea** is different, because it is made from **natural gas**.

India's exposure:

- India imported **2.25 MMT** of sulphur in 2025, about **90% from West Asia**.
- About **52%** of the sulphur used by the fertiliser industry is imported.
- India's **phosphoric acid capacity** meets only **half** of its need.
- **IFFCO, Coromandel and Paradeep Phosphates** have secured rock phosphate through **joint ventures** in Jordan, Senegal and Morocco.

Provisions and Pricing

- The **Fair and Remunerative Price (FRP)** for sugarcane is approved by the **CCEA** on the recommendation of the **CACP**.
- States like **UP and Punjab** fix a higher **State Advised Price (SAP)**.
- Under the **Sugarcane (Control) Order, 1966**, mills must pay farmers within **14 days** of delivery.
- The **Rangarajan Committee (2012)** recommended linking **cane prices to sugar prices**.

Significance

- Both crises show how **input shocks** can threaten **food security** and **farm incomes**.
- The red rot case highlights the danger of **monoculture** and the need for **varietal diversity**.
- The sulphur shock exposes India's **import dependence** in **fertiliser raw materials**.
- Higher costs will raise the **fertiliser subsidy bill**.

Challenges

- **Seed replacement** for a new cane variety takes **several seasons**.
- **DAP and NPK shortages** may hit **rabi sowing** of wheat, mustard and gram.
- Heavy reliance on **West Asia** leaves supplies exposed to **conflict and export bans**.
- Fertiliser firms face **squeezed margins** if they cannot pass on costs.

Way Forward

- Speed up approval and distribution of **disease-resistant varieties** like **Co-20016**.
- Promote **varietal diversity** and **crop rotation** to prevent monoculture.
- **Diversify sulphur sources** and expand domestic **phosphoric acid capacity**.

- Recover more sulphuric acid from **copper and zinc smelting**.
- Promote **balanced fertiliser use** based on **Soil Health Cards** → See Part K for **Khet Bachao Abhiyan**.

Conclusion

- Both crises show that **crop resilience** depends on **varietal diversity** and **secure input supply chains**. Reducing **import dependence** and preventing **monoculture** are key to protecting farmers.

Data Centres: Digital Boom vs Climate Reality

Why in News

- India is seeing a **data centre boom**, with large investments and States competing to attract projects.
- The boom is putting heavy pressure on **electricity, water and land**, and there is **no national framework** to assess these costs.

About Data Centres

- A **data centre** is a secure facility that houses **servers, storage and networking equipment** for storing and processing digital data.
- Data centres power **cloud computing, AI, digital payments and e-governance**, and they are **energy- and water-intensive** because they need constant power and cooling.
- The **NIC** runs **National Data Centres** at Delhi, Pune, Hyderabad and Bhubaneswar.

The Environmental Pressures

- **Water stress:** Data centres' water use may rise from **150 billion litres (2024–25)** to **358 billion litres (2030)**, and many are located in **water-stressed regions**.
- **Grid strain:** Their power demand may rise from **13 TWh (2024)** to **57 TWh (2030)**. Because transmission is weak, India **curtailed 300 GWh of renewable energy** in Q1 2026, which pushes data centres towards **coal**.
- **Urban heat:** Data centres raise **land surface temperatures** by about **2°C** within a 10 km radius.

This creates a **feedback loop**: more heat leads to more cooling, which needs more power, which causes more emissions and more heat.

Policy Framework

- Data centres got **infrastructure status** in the **Union Budget 2022–23**.
- The **IndiaAI Mission** and **Semicon 2.0** support the wider digital ecosystem.

Significance

- Data centres are **critical infrastructure** for **Digital India, AI and data sovereignty**.
- The boom tests India's ability to balance digital growth with **Net Zero 2070**.

Challenges

- **State incentives** come with weak safeguards. **Maharashtra** cut its renewable energy requirement to **51%**.
- **Transmission** is the main bottleneck. India meets only about **80%** of its annual transmission targets.
- Projects are clustered in **water-stressed cities** such as Mumbai, Hyderabad and Bengaluru.

Way Forward

- Create a **national sustainability framework** with common standards on energy, water and heat.
- Make the **BIS standards mandatory**, with a national rating system.
- Invest in **transmission and battery storage**.
- Encourage data centres in **water- and grid-friendly locations**, and make them pay a fair share of grid costs.

Conclusion

- Data centres are essential to India's **digital future**, but they must be built **sustainably**. A national framework that treats **water, power and heat** as real economic limits would make this growth **durable and responsible**.

Food Systems: Food Loss and Waste, and Decentralised Grain Storage

Why in News

- The **FAO** said that cutting **food loss and waste** can deliver a **"triple win"**: better food security, lower emissions and higher farm incomes.
- The **Ministry of Cooperation** reported that **313 PACS** have completed godowns under the **Decentralised Grain Storage Plan**, adding over **1.80 lakh MT** of capacity.

More on the News

- India is the only country to have conducted **three national post-harvest loss surveys**. A **fourth round** is under way.
- Wholesale markets generate about **3.5 million tonnes of organic waste** a year.
- The storage plan is described as the world's largest grain storage plan in the cooperative sector.

About Food Loss and Food Waste

- **Food loss** happens at the **production, post-harvest, storage and processing** stages. It is caused by poor storage, weak cold chains and poor handling, and **national surveys** cover it well.
- **Food waste** happens at the **retail, food service and household** levels. It is caused by over-buying and discarding edible food, and **data on it is weak**.
- **SDG Target 12.3** aims to **halve per capita food waste** at the retail and consumer levels and to reduce food losses by **2030**.
- India's surveys were held in **2005–07, 2012–14 and 2020–22**.

Key Facts on Waste and Emissions

- Treating the country's market waste could offset about **3.3 million tonnes of CO₂-equivalent** a year.
- **Surat's 50 TPD bio-CNG plant** cuts about **7,500 tonnes** of methane-related emissions a year.
- The **FAO** is preparing a **"Package of Practices"** to help cities manage food waste.

About the Decentralised Grain Storage Plan

The plan was launched by the **Ministry of Cooperation** on **31 May 2023**. It builds **village-level godowns** through **PACS**, with the **NCDC** as the implementing agency, and it works by **converging existing schemes** rather than creating a new fund.

- The **AMI subsidy** was raised from **25% to 33.33%**, and **margin money** was cut from **20% to 10%**.
- With the **3% interest subvention** under the **AIF**, the effective interest rate for PACS falls to just **1%**.
- **NABARD** provides refinance, and the **FCI** offers **assured hiring** of godowns.
- **PACS** are the lowest tier of the **three-tier cooperative credit structure**: PACS → DCCBs → StCBs.

Government Initiatives

- **PM Kisan SAMPADA Yojana** supports **cold chain** and **food processing** infrastructure.
- **SATAT** and **GOBARdhan** promote **bio-CNG** and **biogas** from organic waste.
- **Swachh Bharat Mission–Urban 2.0** focuses on **solid waste management** in cities.
- **FSSAI's food recovery** initiatives encourage the safe **donation of surplus food**.

Provisions

- **Article 47** directs the State to raise **nutrition levels** and improve **public health**.
- **Article 48A** and **Article 51A(g)** call for **protecting the environment**.
- The **Twelfth Schedule** assigns **solid waste management** to **urban local bodies**.
- The **National Food Security Act, 2013** and the **Food Safety and Standards Act, 2006** govern food security and safety.

Significance

- Saving food already grown is **faster and cheaper** than **growing more**.
- Diverting market waste from landfills cuts **methane**, a potent greenhouse gas.
- Local storage helps farmers avoid **distress sales** and get **better prices**.
- Decentralised godowns **reduce transport costs** and strengthen the **PDS supply chain**.

Challenges

- **Weak data** on retail and household waste makes targets hard to set.
- **Cold chain and storage gaps** cause the highest losses in **perishables**.
- **Small farmers, FPOs and MSMEs** struggle to access **affordable credit**.
- **Poor segregation** at markets sends organic waste to **landfills**.

Way Forward

- Extend data collection to **retail, hospitality and households** through the **fourth survey**.
- Pair **affordable credit** with proven **storage and cooling** technologies at loss hotspots.
- Scale up models like **Surat's bio-CNG plant** through **public–private partnerships**.
- Speed up the **grain storage plan** and link PACS godowns with **procurement** and the **PDS**.
- Promote **safe redistribution** of surplus food.

Conclusion

- India already has the **data, technology and working models** to cut food loss and waste. **Closing data gaps** and **directing finance** to storage and recycling can turn this problem into a gain for **farmers, consumers and the climate**.

Notes - Prelims Relevance

Fiscal Deficit at 26.8% of Target and Tax Devolution

Why in News

- The **Controller General of Accounts (CGA)** reported that the Centre's **fiscal deficit** reached **26.8%** of the full-year target by the **end of July 2026**. Tax devolution to **States** was lower than in the same period last year.

Key Facts

The **fiscal deficit** is the gap between the government's **total expenditure** and its **total receipts excluding borrowings**. It shows how much the government must **borrow** in a year. A deficit at **26.8%** of the target after four months suggests the Centre is **broadly on track**.

- The **revenue deficit** is the gap between **revenue expenditure** and **revenue receipts**.
- The **primary deficit** is the fiscal deficit **minus interest payments**.
- The **FRBM Act, 2003** sets the framework for **fiscal discipline**.
- The Centre has shifted its fiscal anchor towards a **debt-to-GDP** target of about **50% (±1%) by 2030–31**.
- Under **Article 270**, Central taxes are shared with States based on **Finance Commission** recommendations.

Mains Angle

- Controlled deficits support **macroeconomic stability** and **credit ratings**.
- **Lower devolution** may squeeze **State finances** and welfare spending.
- Shifting to a **debt target** gives more flexibility than a rigid deficit target.
- **Fiscal federalism** needs **predictable** fund transfers to States.

Conclusion ; The Centre's deficit is on track, but **lower devolution** may put pressure on **State budgets**.

JCR Upgrades India's Credit Rating to 'A-'

Why in News

- The **Japan Credit Rating Agency (JCR)** upgraded India's **sovereign credit rating** from **BBB+ to A-**.
- The **Ministry of Finance** welcomed the move as a sign of India's **strong fundamentals**.

More on the News

- JCR cited India's **high growth rate**, which is around **7%**.
- It praised reforms such as **GST** and **Digital Public Infrastructure (DPI)**.
- It also noted a **stronger and more stable financial system**.

Key Facts

A **credit rating** assesses a borrower's **ability to repay debt**, and a **sovereign rating** applies this to a **national government**. A higher rating means **lower risk**, which allows India to **borrow at lower interest rates** and attracts **foreign investment**.

- Ratings run from **AAA** (safest) down to **D** (default).
- **BBB- and above** is **investment grade**, while anything below is **speculative** or "**junk**" grade.
- The **Big Three** global agencies are **S&P, Moody's and Fitch**.
- In India, rating agencies such as **CRISIL, ICRA, CARE** and **India Ratings** are regulated by **SEBI**.

Prelims Pointers

- **JCR** is a **Japanese** credit rating agency.
- India's upgrade to **A-** moves it **higher within investment grade**.
- **S&P** upgraded India to **BBB** in **August 2025 [S]**.
- Domestic rating agencies are regulated by **SEBI**.

Mains Angle

- Better ratings lower the **cost of borrowing** for the government and companies.
- India has long argued that Western agencies **under-rate emerging economies**.
- The **Economic Survey** has criticised the **opaque methodology** of global rating agencies.
- Upgrades reinforce **investor confidence** amid global uncertainty.

Conclusion ; The JCR upgrade strengthens India's image as a **stable, investment-grade** economy.

Offer for Sale and India's IPO Boom

Why in News

- India is witnessing a **record IPO boom**, but much of the money raised comes through **Offer for Sale (OFS)** rather than **fresh capital**.
- In **FY26**, OFS made up about **59%** of total IPO proceeds.

Key Facts

An **Initial Public Offering (IPO)** is when a private company sells shares to the public for the **first time**. It can have two parts:

- A **fresh issue**, where **new shares** are created and the money goes to the **company**.
- An **Offer for Sale**, where **existing shares** are sold and the money goes to the **sellers**.

SEBI introduced the **OFS mechanism** in **2012** to help promoters meet **Minimum Public Shareholding (MPS)** norms. Under these norms, listed companies must keep at least **25%** of shares with the **public**. The government also uses OFS for **disinvestment** in PSUs like **ONGC, NTPC, NMDC, SAIL** and **NALCO**.

In India, OFS can be **bundled into an IPO**. In the **US, Europe and Japan**, such sales usually happen only **after** a company is listed.

Mains Angle

- A high OFS share means IPOs are funding **exits**, not **new investments**.
- OFS still deepens **capital markets** and improves **price discovery**.
- It helps the government meet **disinvestment** targets.
- Policy should encourage more **fresh-issue** IPOs that fund **capacity building**.

Conclusion ; India's IPO boom is real, but much of it reflects **ownership transfer** rather than **fresh investment**.

FPI Outflows and Rupee Depreciation

Why in News

- **Foreign Portfolio Investors (FPIs)** sold **₹13,138 crore** of Indian shares in the **first 10 trading days** of September.
- FPIs have pulled out a record **₹2.38 lakh crore** from Indian equities in **2026** so far.

More on the News

- The **rupee** weakened for **five straight sessions** to **₹95.88** per US dollar.
- FPI selling raises **demand for dollars**, which puts pressure on the rupee.
- The **RBI** has announced steps to attract **dollar deposits** from **NRIs**.
- A weaker rupee makes **imports**, especially **crude oil**, more expensive.

Key Facts

FPI is investment by foreigners in **shares and bonds** without seeking **control** of a company. It is **short-term**, **liquid** and easily withdrawn, which is why it is often called “**hot money**”. **FDI**, in contrast, involves **long-term ownership and control**, such as building a factory.

Feature	FDI	FPI
Nature	Long-term , control-seeking	Short-term , passive
Volatility	Low	High (“hot money”)
Threshold	10% or more of a company’s equity	Below 10%

Effects of large FPI outflows:

- Pressure on the **rupee** and the **forex reserves**.
- Higher **import costs**, which feed **imported inflation**.
- Greater **volatility** in the **Sensex and Nifty**.

Prelims Pointers

- FPIs are governed by the **SEBI (Foreign Portfolio Investors) Regulations, 2019**.
- The **primary market** deals with **new issues**, while the **secondary market** trades **existing securities**.

Mains Angle

- Heavy reliance on **FPI** makes India vulnerable to **global shocks**.
- A weak rupee can **boost exports** but **raise the import bill**.
- Stable **FDI** is preferable to volatile portfolio flows.
- Building **forex buffers** and **domestic investor** depth reduces vulnerability.

Conclusion ; Record FPI outflows show the need for **stable, long-term capital** and a stronger **domestic investor base**.

Kandla, JNPA, Mundra and Paradip Notified as Mega Ports

Why in News

- The **Ministry of Ports, Shipping and Waterways** has declared four ports as “**Mega Ports**” under the **Indian Ports Act, 2025**.
- They are **Deendayal (Kandla)** and **Mundra** in Gujarat, **JNPA (Nhava Sheva)** in Maharashtra and **Paradip** in Odisha.

Key Facts

- The **Indian Ports Act, 2025** replaced the colonial-era **Indian Ports Act, 1908**.
- It allows the **Centre, in consultation with States**, to set the criteria for **Mega Ports**.
- It gives **statutory recognition to State Maritime Boards** and the **Maritime State Development Council**.
- India has **12 major ports** under the Centre and around **200 non-major ports** under the States. **Vadhavan (Maharashtra)** is being developed as the **13th major port**.



Prelims Pointers

- **Paradip** is the only **east-coast** port among the four Mega Ports.

- **Major ports** are under the **Centre**, while **non-major ports** are under **State Maritime Boards**.
- **Vadhavan** is India's upcoming **13th major port**.
- The **Indian Ports Act, 2025** replaced the **1908** law.

Mains Angle

- Mega ports can attract **large ships** and cut **logistics costs**.
- They support India's goal of becoming a **global maritime hub** under **Maritime India Vision**.
- The Act strengthens **cooperative federalism** in port governance.
- Including a **private port (Mundra)** shows growing **public-private** roles in shipping.

Conclusion ; The mega-port tag positions India's leading ports to compete with **global trans-shipment hubs**.

Clean Fuels and Transport: e-Methanol at Kandla and India's First LNG Train

Why in News

- India's first **port-based e-methanol plant** is being set up at **Deendayal Port, Kandla**.
- Union Home Minister **Amit Shah** flagged off India's first **LNG-powered train** from **Sabarmati, Ahmedabad**.

More on the News

- The Kandla plant will produce **green fuel for ships**, which will help India become a **green fuel exporter**.
- Kandla is being developed as a **Green Bunkering Hub** and a **Green Hydrogen Hub**.
- The LNG train aims to cut **diesel use and emissions** on Indian Railways.
- A new **WAG-12 maintenance shed** was also inaugurated at Sabarmati.

Key Facts

- **e-Methanol** is made by combining **green hydrogen**, produced through electrolysis using renewable power, with **captured CO₂**. **Grey methanol** is made from fossil fuels. Methanol made from biomass or waste is called **bio-methanol**.
- The plant supports India's plan to add **100 ships in five years** and become a **top-five ship-owning nation by 2047**.

- The **National Green Hydrogen Mission (2023)**, run by **MNRE**, targets about **5 MMT** of green hydrogen a year by **2030**.
- The **WAG-12** is a **12,000 hp** twin-section electric locomotive for heavy freight.

Mains Angle

- **Green fuels** can decarbonise **shipping**, which is a hard-to-abate sector.
- Kandla's location on the **Asia-Europe route** makes it well suited for **green bunkering**.
- Cleaner rail fuels support **Net Zero 2070** and open up new **green export** opportunities.

Conclusion ; Green fuels at ports and on railways mark India's shift towards **clean transport and logistics**.

Energy Transition: Small Hydro Power and Geothermal Energy at Puga

Why in News

- The government has announced a **Small Hydro Power (SHP) Development Scheme** for **2026-27 to 2030-31**.
- **ONGC Energy Centre** commissioned India's **first two geothermal wells** at **Puga Valley, Ladakh**, in July 2026.

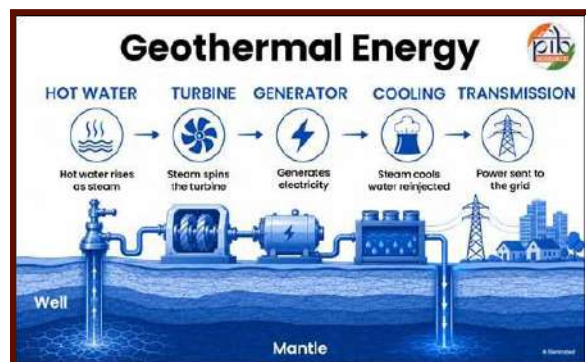
More on the News

- The SHP scheme targets about **1,500 MW** of new capacity and will fund **DPRs for about 200 projects**.
- India has about **21 GW** of SHP potential, of which only about **5.2 GW** has been harnessed.
- The wells will support India's first **1-MW demonstration geothermal plant**.
- Puga lies at over **14,000 feet** in **Changthang** and supports the **"Carbon-Neutral Ladakh"** vision.

Key Facts

- **SHP** covers hydro projects of **up to 25 MW** and comes under **MNRE**. Larger projects come under the **Ministry of Power**.
- The categories are **micro (up to 100 kW)**, **mini (101 kW-2 MW)** and **small (2-25 MW)**.
- India's first SHP plant was a **130 kW** station at **Darjeeling (1897)**.
- **Geothermal energy** is heat from the Earth's interior and provides **round-the-clock power**. India's potential is about **10,600 MW**, and the **GSI** has mapped **381 hot springs**. The **National**

Policy on Geothermal Energy was notified in **September 2025**.



Mains Angle

- Both sources provide **steady, baseload** power to complement **solar and wind**.
- They can bring **clean energy** to **remote Himalayan** areas and cut **diesel use**.
- High **drilling and exploration costs** remain a barrier to geothermal energy.
- Fragile Himalayan ecosystems** need careful **environmental assessment**.

Conclusion ; Small hydro and geothermal energy can make India's **clean energy mix** more **reliable and decentralised**.

Industrial Indicators: IIP at 8% and the Index of Core Industries

Why in News

- India's **Index of Industrial Production (IIP)** grew **8%** in August 2026, up from **7.35%** in July.
- The **Office of the Economic Adviser (OEA)** released the **Index of Core Industries (ICI)** for August 2026, with **2022-23** as the base year.

Key Facts

- The **IIP** measures changes in the **volume of industrial production**. It is compiled every month by the **NSO (MoSPI)**.
- It covers **mining, manufacturing and electricity**, and **manufacturing** has the largest weight.
- Growth in **capital goods** signals rising **investment demand**.
- The **ICI** tracks **eight core industries**: coal, crude oil, natural gas, refinery products, fertilisers, steel, cement and electricity. Together they make up nearly **40%** of the weight of items in the IIP.

Prelims Pointers

- The **IIP** is compiled by the **NSO**. The **ICI** is compiled by the **OEA, DPIIT**.
- Electricity and refinery products** carry the highest weights in the ICI.
- Both indices now use **2022-23** as their base year.

Mains Angle

- Strong IIP growth reflects robust **manufacturing and investment**.
- Electricity demand** has reached a **27-month high**, which points to rising economic activity.
- Declines in **coal, natural gas, crude oil and fertilisers** show weakness in some sectors.

Conclusion ; Industrial data for August shows broad-based momentum, led by manufacturing and power.

Merchant Discount Rate on UPI Payments

Why in News

- NPCI** has announced that from **15 October**, merchants will pay a **Merchant Discount Rate (MDR)** of **0.4%** on UPI payments **above ₹2,000**.
- The move ends the **zero-MDR regime** that has applied to UPI since **2020**.

Key Facts

- The **MDR** is the fee a **merchant** pays banks and payment providers for accepting digital payments. It funds the **payment infrastructure**.
- Under **zero MDR**, the government compensated banks through an **incentive scheme**. The **new framework** keeps **small payments free** and charges **larger merchant payments**.
- NPCI (2008)** was set up by the **RBI and IBA** as a **not-for-profit Section 8 company** under the **PSS Act, 2007**.
- NPCI is an **operator, not a regulator**. The **RBI** regulates payments.
- Its products include **UPI, RuPay, IMPS, FASTag, AePS and BHIM**.

Prelims Pointers

- UPI** was launched by **NPCI** in **2016**.
- NPCI** is **not** a statutory regulator; the **RBI** is the regulator.
- The **MDR** is paid by the **merchant**, not the customer.
- P2PM** refers to **very small merchants**, treated like individuals for fee purposes.

Bankers' Books Evidence Act, 2026

Why in News

- The **Bankers' Books Evidence Act, 2026** will come into force on **1 October 2026**.
- It replaces the **130-year-old Bankers' Books Evidence Act, 1891**.

More on the News

- The new Act **modernises** how **banking records** are used as **evidence** in courts.
- It recognises **paper, electronic, digital and cloud-based** records as valid evidence.
- Bank officials can be **summoned** only if the court records a "**special cause**" in writing.
- The **Centre** can extend the Act to **NBFCs and fintech** companies in future.

Key Facts

- The **1891 Act** was written for **paper records** and had no clear provisions for **core banking, digital ledgers or cloud storage**. This caused delays when digital records were used in court.
- The new law is **technology-neutral**. Records can be certified with **manual, digital or electronic signatures**.
- Bank staff can be **summoned** only when there is a **special cause**, which reduces their burden.
- The law supports **Ease of Doing Business** and **faster dispute resolution**.

Mains Angle

- The Act aligns **evidence law** with **digital banking**.
- It reduces **litigation delays** in banking disputes.
- Extending it to **NBFCs and fintechs** would cover the wider **financial sector**.
- Strong **data integrity** and **cybersecurity** safeguards will be needed.

Conclusion ; The new Act brings banking evidence law into the **digital age**.

Coal India's Technology-Led Diversification

Why in News

- **Coal India Limited (CIL)** is diversifying into **coal gasification, thermal and solar power, battery storage and critical minerals**.

- It is also strengthening **R&D** through **IIT-based Centres of Excellence**.

Key Facts

- **Coal gasification** converts coal into **syngas**, which is used to make **urea, methanol, natural gas and chemicals**.
- It lets India turn its **high-ash coal** into higher-value products instead of only burning it.
- It supports **import substitution** in urea, natural gas and critical minerals.
- It prepares **CIL** for a **low-carbon future**, even though coal still meets most of India's power needs.

Mains Angle

- Diversification helps CIL **survive the energy transition**.
- Gasification cuts **imports** of **LNG, urea and methanol**.
- **High-ash coal**, water use and emissions remain **technical and environmental** challenges.
- **UCG and critical minerals** projects are still **untested at scale**.

Conclusion ; CIL's diversification shows how a **coal giant** is preparing for a **low-carbon** economy.

Clean Freight: PACT and the Zero Emission Truck Marketplace

Why in News

- **NITI Aayog Member Rajiv Gauba** launched the **Platform for Aggregating Clean Transport (PACT)** and the **Zero Emission Truck (ZET) Marketplace**.
- They were launched at the **5th E-FAST India Summit 2026**.

Key Facts

E-FAST India, the **Electric Freight Accelerator for Sustainable Transport**, is a platform for **clean freight**. Electric trucks remain **costlier** than diesel ones upfront. **Blended finance** and **leasing models** can help close this cost gap.

Related government support includes:

- **PLI schemes** for **automobiles** and **Advanced Chemistry Cell (ACC) batteries**.
- **Public charging** expansion through **Oil Marketing Companies**.

- **Demand-side** schemes such as **FAME**, **PM e-DRIVE** and **PM e-Bus Sewa**.

Mains Angle

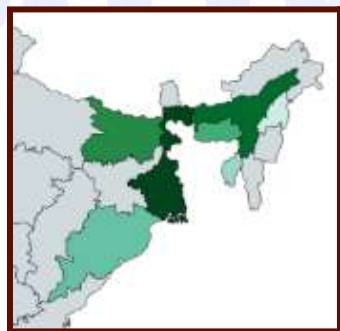
- Decarbonising **freight** is vital for India's **Net Zero 2070** goal.
- Electric trucks also cut **oil imports** and **urban air pollution**.
- **High costs** and weak **charging** infrastructure slow adoption.
- **Green corridors** on key freight routes can drive early demand.

Conclusion ; Electric trucks are key to making India's road freight clean and **energy-secure**.

Commodity and Sector Quick Facts

Jute: India's Golden Fibre

- India is the **largest producer** of **raw jute** and **jute goods**, and contributes about **75%** of global jute goods.
- Jute needs a **hot, humid** climate with **700–1,500 mm** rainfall. It is grown mainly in **West Bengal, Bihar, Assam, Odisha** and **Jharkhand**.
- The **MSP for 2026–27** is **₹5,925 per quintal**, and the **Jute Corporation of India** is the nodal procurement agency.
- The **Jute Packaging Materials Act, 1987** mandates jute packing for **100%** of foodgrains and **20%** of sugar.



Coir: From Coconut Husk to Rural Enterprise

- India produces over **80%** of the world's **coir fibre**, and its first coir factory was set up at **Alappuzha, Kerala**, in **1859**.
- **Women** make up nearly **80%** of workers in fibre extraction and spinning.

- The **Coir Board** is a **statutory body** under the **Ministry of MSME**, and supports the sector through the **Coir Vikas Yojana**.
- The **Central Coir Research Institute** has developed **eco-friendly coir cups** to replace **plastic** in railway packaging.

Bamboo: From Green Stems to Green Enterprises

- A **2017 amendment** to the **Indian Forest Act, 1927** removed bamboo grown on **non-forest land** from the definition of a “**tree**”.
- The **National Bamboo Mission** supports **cultivation, processing and market access**.
- **NECTAR** has raised value addition for bamboo products from **10% to 70%**.
- The **Gadchiroli Agarbatti Project** employs about **1,100** people, nearly **90%** of them **women**.

Onion: Geographical Conditions

- Onion (*Allium cepa*) is a **cool-season** crop that grows best at **13–25°C**, with **650–1,000 mm** rainfall.
- It prefers **well-drained sandy loam** soils, with a **pH of 6.0–7.5**.
- It is grown in **three seasons**. The **rabi** crop forms about **65–70%** of output and stores best.
- **Maharashtra** is the largest producer, and **Lasalgaon** is **Asia's largest onion market**.

Assam Pu'er Tea

- **Assam-made pu'er tea cakes** sold for **₹12,000 per kg** at the **Guwahati Tea Auction Centre**.
- **Pu'er** is a **fermented, aged** tea from **China's Yunnan** province, made in **Sheng** and **Shou** styles.
- India is the **second-largest tea producer**, after China, and the **largest producer of black tea**.
- The **Tea Board** was set up under the **Tea Act, 1953**. **Assam Orthodox Tea** received a **GI tag** in **2007**.



Dryland and Regenerative Agriculture

- The **Global Dryland Congress 2026**, held by **ICAR and ICRISAT**, marked **50 years** of their partnership. It adopted the **Delhi Declaration on Drylands (3D)**.
- **ICRISAT** is headquartered at **Patancheru, Hyderabad**, and focuses on **sorghum, pearl millet, chickpea, pigeonpea and groundnut**.
- **CAZRI**, Jodhpur, developed four **moth bean** varieties that survived a **35-day dry spell** in the **El Niño year** of 2026.
- India recorded its **first soil carbon payments**, with **₹2.9 crore** paid to over **2,500 farmers** in **Punjab and Haryana** under the 'Aadi' programme.

PART E : ENVIRONMENT, CLIMATE AND ECOLOGY

Full Articles - Mains Relevance

Super El Niño 2026: Monsoon, Heat, Coral and Forest Risks

Why in News

- The **World Meteorological Organization (WMO)** has warned that the current **El Niño** may become the **strongest ever recorded**, lasting until about **February 2027**.
- A **Climate Impact Lab** report estimates that it could cause about **15,800 additional heat-related deaths** in India between **September 2026 and February 2027**.

More on the News

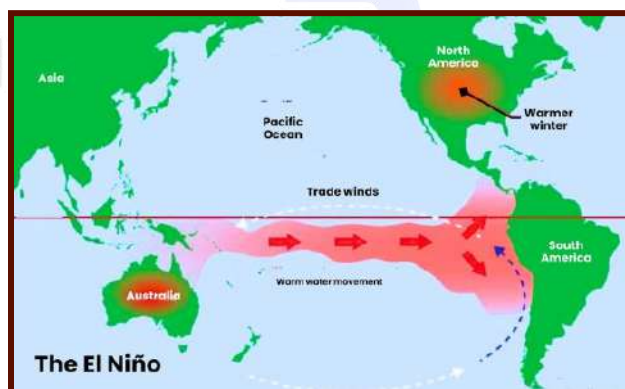
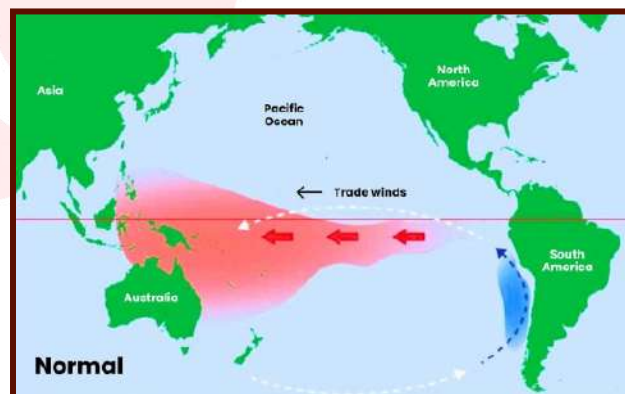
- India's **southwest monsoon** has recorded a rainfall **deficit of about 15%**.
- High temperatures have raised **electricity demand**, and nearly **40% of coal plants** report **critically low coal stocks**.
- On **16 September**, **188 Indian scientists** issued a "**Call to Action**", warning of **heatwaves, drought, coral bleaching and wildfires** from **November 2026 into 2027**.
- Globally, the event could cause about **4.51 lakh extra heat-related deaths**.

About El Niño

- **El Niño** means "**the little boy**" in Spanish, a name given by Peruvian fishermen who noticed **warm waters** around **Christmas**.
- It is an unusual **warming of sea-surface temperatures** in the **central and eastern equatorial Pacific**.
- It is the **warm phase** of the **El Niño–Southern Oscillation (ENSO)**, and occurs every **2–7 years**, usually lasting **9–12 months**.

How it works:

- In normal years, **trade winds** push warm water west towards **Indonesia and Australia**, while **cold, nutrient-rich water** rises off **Peru** through **upwelling**.
- During **El Niño**, the trade winds **weaken**, warm water spreads **eastward**, and **upwelling declines**.
- This weakens the **Walker Circulation**, which shifts rainfall away from the Indian region and **weakens the monsoon**.



Scientists track El Niño using the **Oceanic Niño Index (ONI)** in the **Niño 3.4** region. An anomaly of **+0.5°C** or more marks El Niño. A "**super**" El Niño is an informal term for an anomaly of about **+2.0°C** or more, as in **1997–98 and 2015–16**.

Feature	El Niño	La Niña
Pacific sea temperature	Warmer	Cooler
Trade winds	Weaker	Stronger
Indian monsoon	Usually weaker	Usually stronger

The Indian Ocean Dipole (IOD)

- The **IOD** is the difference in sea temperature between the **western and eastern Indian Ocean**.
- It is sometimes called the “**Indian Niño**”, and was identified as an **independent system** in **1999**.
- A **positive IOD** (warmer west) usually **helps** the Indian monsoon and can **offset** El Niño’s effect. A **negative IOD** weakens it.

Impact on India

- **Agriculture:** The **southwest monsoon** provides about **70%** of India’s annual rainfall. A weak monsoon hurts **kharif crops** and leaves less **soil moisture** for rabi sowing.
- **Inflation:** ICRA estimates that serious farm disruption could raise **food inflation** by about **0.4 percentage points**.
- **Coral reefs:** Warm seas cause **coral bleaching**. **Lakshadweep’s coral cover** fell about **50%** between 1998 and 2022.
- **Forests:** Long droughts raise **tree deaths** and **wildfire risk**, especially in the **Western Ghats**.
- **Health and energy:** Heat raises the risk of **heatstroke** and pushes up **power demand**.

Global Impacts

- **Droughts and wildfires** in **Indonesia, Australia** and **South-East Asia**.
- **Floods** along the coasts of **Peru and Ecuador**.
- **Fisheries decline** off Peru, as upwelling weakens.
- High projected heat deaths in the **Sahel (66,800)**, **Indonesia (19,300)** and **Brazil (13,300)**.

Significance

- El Niño links **ocean–atmosphere** processes directly with **food security, health and energy**.
- It shows how **climate variability** compounds the effects of **climate change**.
- It tests India’s **heat action plans** and **drought preparedness**.

- It highlights the need to protect **vulnerable ecosystems** like **coral reefs** and **forests**.

Challenges

- **Farmers, fishers and outdoor workers** face the biggest risks.
- Low **coal stocks** threaten **power supply** during peak demand.
- **Coral reefs** need over a **decade** to recover, and the last major El Niño was only in **2023–24**.
- Subtle impacts, such as **delayed fruiting** or changes in **animal behaviour**, are hard to monitor.

Way Forward

- Strengthen **Heat Action Plans** and **early-warning systems** at district level.
- Promote **drought-resistant crops, crop insurance** and **water conservation**.
- Build **coal stocks** and expand **renewable energy** and storage.
- Expand **long-term ecological monitoring** of coral reefs and forests.
- Protect **outdoor workers** through work-hour changes and **cooling shelters**.

Conclusion

- A Super El Niño could strain India’s **monsoon, health and energy systems** at once. **Early preparation** across agriculture, power and public health can limit the damage.

Stubble Burning, “Red Entry” Rules and the CAQM

Why in News

- The **Environment Ministry** released **draft rules** proposing a “**red entry**” in land records for farms where **stubble is burnt**.
- The **CAQM** is working with **ISRO** and the governments of **Punjab and Haryana** to improve the **tracking of farm fires** before winter.

About Stubble Burning

Stubble burning is the practice of setting fire to **paddy straw** after harvest, to quickly prepare fields for **wheat sowing**. It is common in **Punjab, Haryana** and parts of **Uttar Pradesh**. Farmers burn stubble because:

- The window between **paddy harvest and wheat sowing** is very short.

- Residue-management **machines are costly**.
- **MSP and assured procurement** favour **paddy**.
- **Paddy straw** has little market value.

Pollution worsens in **October–November**, when the **withdrawal of the monsoon** stills the winds and traps pollutants over **Delhi-NCR**. Stubble burning contributes up to **15%** of particulate matter over a winter, and up to **44%** in **peak weeks**.

About the CAQM

The **Commission for Air Quality Management (CAQM)** in the **NCR and Adjoining Areas** began as an **Ordinance in October 2020** and was made statutory by the **CAQM Act, 2021**. It replaced the **EPCA**.

- It covers **Delhi, Punjab, Haryana** and the **NCR** parts of **Uttar Pradesh and Rajasthan**.
- It can issue **binding directions**, and its orders can be appealed only before the **NGT**.
- Violators face up to **5 years** in jail or a **₹1 crore** fine, but **farmers are excluded** from jail and pay **environmental compensation** instead.

The Red Entry Proposal

The draft rules keep the **existing compensation slabs**. The money raised would fund **crop diversification, biomass use, research and residue-management machines**. **Haryana** already bars farmers who burn stubble from its **Meri Fasal Mera Byora** portal for **two years**. **Punjab's farm unions** worry about the impact on **loans and mortgages**.

Solutions to Stubble Burning

- **In-situ management:** **Happy Seeder** and **Super Seeder** machines sow wheat directly through stubble, and the **Pusa Bio-decomposer** (developed by **IARI**) turns straw into manure.
- **Ex-situ management:** Stubble can be used for **biomass co-firing** in thermal plants, **bio-CNG**, **2G ethanol** and **industrial pellets**.
- **Structural reform:** Moving away from **paddy** through **crop diversification** and better **MSP incentives** for other crops.

Provisions

- The **Air (Prevention and Control of Pollution) Act, 1981** and the **Environment (Protection) Act, 1986** govern air pollution.
- **Article 21** includes the **right to a clean environment**, as interpreted by the Supreme Court.

- **Article 48A** and **Article 51A(g)** call for **protecting the environment**.
- The **NGT** banned crop residue burning in the **NCR States** in **2015**.

Significance

- Stubble burning is a major cause of the **winter air crisis** in North India.
- It also causes **soil nutrient loss** and kills **useful soil microbes**.
- The red entry shifts policy from **fines** to **record-based deterrence**.
- Better **satellite tracking** improves **evidence-based enforcement**.

Challenges

- **Penalties** may hurt **small farmers** who cannot afford machines.
- **Evening burning** undermines satellite-based monitoring.
- The **paddy–wheat cycle** remains locked in by **procurement policy**.
- **Ex-situ** markets for straw are still **underdeveloped**.

Way Forward

- Combine penalties with **incentives**, as the **Parliamentary Committee on Subordinate Legislation** recommended in **February 2025**.
- Allow **early removal** of red entries for farmers who adopt **sustainable practices**.
- Expand access to **subsidised residue-management machines**.
- Build **biomass supply chains** for power plants and biofuel units.
- Promote **crop diversification** through **MSP reform**.

Conclusion

- Stubble burning cannot be solved by **penalties alone**. A mix of **incentives, technology and crop diversification** offers a lasting solution.

Waste and the Circular Economy: E-Waste, WCEF and Rural Models

Why in News

- India hosted the **World Circular Economy Forum (WCEF) 2026** in **Gandhinagar** (15–18 September). It was the first edition held in **South Asia**.

- The **Swachhata Hi Seva (SHS) 2026** campaign was launched on **17 September** under the theme “**Swachhata Mein Sahbhag**”.
- Analysts argue that **e-waste** should be treated as a **strategic asset for critical minerals**, not merely as a disposal problem.

More on the News

- India generated about **1.5 million tonnes** of e-waste in 2025. About **60%** of its value is recoverable, but only about **18%** is recovered.
- **Depalpur (MP)**, mentored by **Indore**, became the first city under **Swachh Shehar Jodi** to achieve “**Zero Legacy Waste**”.
- **Community-led models** in **Majuli (Assam)** and **Arunachal Pradesh** show that rural waste management can work.
- The **Supreme Court** has criticised weak implementation of the **Solid Waste Management Rules, 2026**.

About the Circular Economy

- A **circular economy** keeps resources in use through **reduce, reuse, recycle and recover**, replacing the linear “take–make–dispose” model.
- India generates about **1.7 lakh tonnes** of waste a day, and about **22%** of it goes to **landfills**.
- **WCEF 2026**, themed “**Circular Economy: Transition for People and Prosperity**”, was organised by the **CPCB**, **Finland’s Sitra** and the **MoEFCC**.

E-Waste as a Strategic Asset

E-waste contains **lithium, cobalt and nickel**, for which India is fully **import-dependent**. **Urban mining**, the recovery of metals from discarded electronics, could be worth up to **\$6 billion a year**. **Informal recyclers**, however, recover mainly **copper and aluminium** and lose the critical minerals.

- The **E-Waste Management Rules, 2022** introduced **EPR certificates**, with recycling targets of **60%, 70% and 80%** for 2023–24 to 2025–26.
- The **National Critical Mineral Mission (2025)** includes recovering minerals from e-waste.
- The **Budget 2025–26** removed customs duty on **lithium-ion battery scrap**.

Urban and Rural Waste Models

- **Swachh Shehar Jodi (MoHUA)**: It pairs **72 mentor cities** with **200 mentee cities** under an “**Each One Teach One**” model.

- **Majuli model** : Collection and sorting centres have collected **82.4 tonnes** of waste since 2024, keeping it out of the **Brahmaputra**.
- **Himalayan model**: Households pay **user fees**, **women’s SHGs** run the sorting, and **multi-layered plastic** is turned into **paver blocks**.
- **Waste-to-energy**: Under **SBM-Urban 2.0**, cities convert organic waste into **compressed bio-gas**.

Swachh Bharat Mission at a Glance

The **SBM** was launched on **2 October 2014**, and rural India was declared **ODF in 2019**. Over **5.69 lakh villages** are now **ODF Plus**, and **1,314 GOBARdhan plants** are running.

Provisions

- The **SWM Rules, 2026** mandate **segregation** and make **local bodies** responsible for processing.
- The **Plastic Waste Management Rules, 2016** provide for **EPR** on plastic packaging.
- The **CPCB** is a statutory body set up under the **Water Act, 1974**.
- The **73rd and 74th Amendments** assign sanitation functions to **Panchayats and Municipalities**.

Significance

- The circular economy reduces **pollution, landfill use** and pressure on **virgin resources**.
- **Urban mining** can strengthen **critical-mineral security**.
- Hosting WCEF strengthens India’s leadership in **global sustainability**.

Challenges

- **Rural waste data** is very limited.
- The **informal sector** dominates recycling, which creates **health hazards** and loses critical minerals.
- **High transport costs** make rural waste unattractive to recyclers.

Way Forward

- Build a **rural waste database** through local bodies.
- **Formalise informal recyclers** through training and incentives.
- Reward **high-quality recycling** under EPR, not just the cheapest certificate.
- Set up **regional recycling hubs** to cut transport costs.

Conclusion

- Treating waste as a **resource** can advance India's **environmental, economic and strategic** goals together. Scaling up **community models** and **formal recycling** is the key to a truly circular economy.

Western Ghats ESA: Gadgil vs Kasturirangan and Kerala's Reset Demand

Why in News

- Kerala has asked the Centre to limit the **Western Ghats Ecologically Sensitive Area (ESA)** in the State to **8,590.69 sq km**, mainly covering **forest areas**.
- Karnataka said that implementing the **Kasturirangan Report** could affect livelihoods in **10 districts**, after the Centre asked for its **final decision** by **27 September**.

More on the News

- The Centre's **draft notification** had proposed about **9,993.7 sq km** of ESA in Kerala, covering **123 villages**.
- Kerala's proposal covers **98 villages**, and excludes **populated areas, farmlands and plantations**.
- The ESA notification has remained in **draft form** since **2014**, with no final notification issued.
- The Centre's **2024 decision** to notify ESAs **State-wise** has allowed each State to negotiate its own boundaries.

About the Western Ghats

- The **Western Ghats** run parallel to India's western coast across **six States: Gujarat, Maharashtra, Goa, Karnataka, Kerala and Tamil Nadu**.
- They are a **global biodiversity hotspot** and a **UNESCO World Heritage Site (2012)**.
- They influence the **monsoon**, host many **endemic species**, and are the source of several **peninsular rivers**.
- An **Ecologically Sensitive Area (ESA)** is a zone where harmful activities like **mining, quarrying and polluting industries** are **restricted**. It acts as a **buffer** to reduce human pressure on fragile ecosystems.

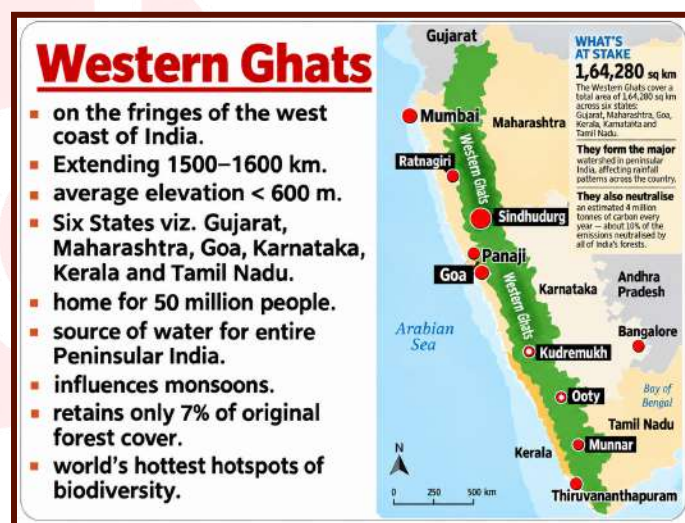
Gadgil vs Kasturirangan

- Gadgil Committee (WGEEP, 2011):** It recommended declaring **almost the entire**

Western Ghats an ESA, divided into **three zones (ESZ-1, 2 and 3)**. It would have restricted most **mining and thermal power** in the most sensitive zone.

- Kasturirangan Committee (HLWG, 2012–13):** Formed after States rejected the Gadgil report, it recommended only about **37%** of the Ghats, roughly **60,000 sq km**, as ESA. It proposed a **complete ban on mining, quarrying and sand mining**, and restrictions on **thermal plants and large townships**.

The key difference is in approach. **Gadgil** favoured a **strict, protective** model, while **Kasturirangan** allowed more **human activity and development**. Kasturirangan also relied on **satellite imagery** to identify **natural landscapes**.



Positions of the States

- Kerala** argues that its **small area, high population density** and existing **forest laws** require a different approach.
- Gujarat** is reportedly close to an agreement, and **Tamil Nadu** has no major disagreement.
- Maharashtra** and **Goa** have sought to exclude **378** and **21** villages respectively.
- Karnataka's Assembly** unanimously **rejected** the Kasturirangan framework, citing **outdated 2012 satellite data**.

Provisions

- ESAs are notified under the **Environment (Protection) Act, 1986**.
- Eco-Sensitive Zones (ESZs)** around **protected areas** are a separate category. They usually extend up to **10 km** around national parks and sanctuaries.

- **Article 48A** directs the State to **protect forests and wildlife**.
- **Environment and forests** fall in the **Concurrent List**, which requires **Centre–State** coordination.

Significance

- The Western Ghats are vital for **water security** across southern and western India.
- The issue is a classic case of **balancing conservation with livelihoods**.
- It tests **cooperative federalism** in environmental governance.
- Delay leaves the region exposed to **landslides, floods** and **unregulated mining**.

Challenges

- **Farmers and plantation workers** fear losing their livelihoods.
- Including **inhabited and farm areas** has created strong local opposition.
- **Outdated data** weakens trust in the boundaries.
- Over a **decade of drafts** has produced **policy paralysis**.

Way Forward

- Use **updated, ground-verified** data to redraw boundaries.
- Consult **Gram Sabhas and local communities** before finalising ESAs.
- Protect **core forest areas** strictly, while allowing **sustainable livelihoods** elsewhere.
- Offer **payments for ecosystem services** to communities that conserve forests.
- Set a **firm deadline** to finalise the notification.

Conclusion

- Protecting the Western Ghats requires **scientifically sound** boundaries and **local consent**. A balanced approach can secure both **ecological health** and **livelihoods**.

Project Cheetah: Four Years of Reintroduction

Why in News

- Madhya Pradesh released **CCB-2 (Radha)**, a female cheetah from **Botswana**, into **Gandhi Sagar Wildlife Sanctuary**.

- An India-born cheetah, **KGP12**, gave birth to **four cubs** at **Kuno National Park**, taking India's cheetah population to **56**.

More on the News

- **Gandhi Sagar** now holds **four cheetahs**, making it the project's established **second site**.
- At Kuno, two **unrelated** males, **KNG23** (born at Kuno) and **CCB4** (from Botswana), have formed a rare **male coalition**.
- Coalitions usually form between **brothers**, so a bond between unrelated adults is **unusual**.
- On the project's **fourth anniversary**, **32** of the then **52** cheetahs had been **born in India**.

About Project Cheetah

- The cheetah was declared **extinct in India** in **1952**.
- **Project Cheetah** aims to bring it back and restore India's **grassland ecosystems**, for which the cheetah is a key **indicator species**.
- It follows an **Action Plan** prepared with the **Wildlife Institute of India (WII)** and the **NTCA**.
- The **Supreme Court** allowed the experimental introduction of **African cheetahs** in **2020**.

Translocation timeline:

- **2022: Eight** cheetahs from **Namibia** were released into **Kuno**.
- **2023: Twelve** cheetahs arrived from **South Africa**.
- **2026: Nine** cheetahs arrived from **Botswana**. "CCB" stands for **Cheetah Conservation Botswana**.

The project is described as the **world's first intercontinental translocation** of a **large wild carnivore**. Its long-term aim is to build a **metapopulation**, which is a set of **connected cheetah groups** across several sites.

The Project Sites

- **Kuno National Park**, in **Sheopur** district, **Madhya Pradesh**, became a sanctuary in **1981** and a national park in **2018**. The **Kuno River**, a tributary of the **Chambal**, flows through it. Kuno was earlier prepared for **Asiatic lions** after a **2013 Supreme Court** order, but that translocation never happened.
- **Gandhi Sagar Wildlife Sanctuary** lies on the **MP–Rajasthan** border, in the **Mandsaur** and

Neemuch area, near the **Gandhi Sagar Dam** on the **Chambal**.

- **Possible future sites** include **Nauradehi** in Madhya Pradesh, the **Banni grasslands** in Gujarat and **Mukundra Hills** in Rajasthan.

Combined management of Kuno and Gandhi Sagar has raised the available habitat to about **3,428 sq km**.



Four Years of Progress

- **Year 1** focused on **introduction and survival** in a new habitat.
- **Year 2** focused on **breeding and cub survival**.
- **Year 3** saw cubs **released into the wild** with their mothers.
- **Year 4** saw India-born cheetahs **establishing territories** and **dispersing** on their own.

About the Cheetah

- The **cheetah** (*Acinonyx jubatus*) is the **fastest land animal**.
- Unlike lions and tigers, it **does not roar**; it **purrs and chirps**.
- It hunts mainly **by day** and prefers **open grasslands**.
- The cheetahs brought to India are **African cheetahs**. The **Asiatic cheetah** now survives only in **Iran**.

Significance

- The project helps restore **grassland ecosystems**, which are often neglected in conservation.
- India-born cubs and new coalitions show the project moving towards a **self-sustaining population**.
- It builds India's capacity in **large-scale wildlife translocation**.
- It strengthens **conservation diplomacy** with African nations.

Challenges

- Kuno and Gandhi Sagar may not have enough **space and prey** for a large population.
- Cheetahs moving out of protected areas raise the risk of **human-wildlife conflict**.
- **African cheetahs** must adapt to **Indian climate and diseases**.
- **Leopards** compete with cheetahs for prey and territory.

Way Forward

- Develop **new sites** to build a **connected metapopulation**.
- Restore **grasslands** and strengthen the **prey base**.
- Create **wildlife corridors** between sites.
- Involve **local communities** in monitoring and compensation.
- Continue **scientific monitoring** of health, breeding and behaviour.

Conclusion

- Project Cheetah has made real progress towards a **wild, breeding population**. Its long-term success depends on **habitat expansion**, **connected sites** and **community support**.

COP31, the UNEP Overshoot Report and India's Climate Targets

Why in News

- **COP31** will be held in **Antalya, Türkiye**, in **November 2026**. **Türkiye** will host and **Australia** will lead the negotiations.
- **UNEP's "Limiting Overshoot" report** says the world will cross the **1.5°C limit** within the next few years.

More on the News

- Both COP31 hosts are major **fossil-fuel users**, which raises doubts about the summit's commitment to the transition.
- Even if all countries meet their pledges, warming will peak at about **1.8°C**.
- **Current policies** put the world on track for about **2.6°C** by 2100.
- India's **non-fossil share** of installed power capacity has crossed **54%**.

About the COP Process

The **COP** is the main decision-making body of the UNFCCC, which was adopted at the **1992 Rio Earth Summit**. It takes decisions by **consensus**.

- **COP28 (2023)** called for a “**transition away from fossil fuels**” for the first time.
- **COP30 (Belém, 2025)**: its “**Global Mutirão**” decision was the first COP text to accept that a **temporary overshoot of 1.5°C** is likely.
- **COP31’s priorities** include raising **electricity’s share of final energy demand to 35% by 2035**, protecting oceans and a “**Climate Implementation Bridge**”. **Loss and damage** and **climate finance** are missing from the list.

The UNEP “Limiting Overshoot” Report

Climate overshoot means temporarily crossing 1.5°C and then bringing temperatures back down through emission cuts and **carbon removal**. The report proposes an “**Overshoot → Peak → Decline**” pathway that returns below 1.5°C by **2100**.

- The remaining **carbon budget** is about **130 billion tonnes of CO₂** and will likely run out **before 2030**.
- **Methane** adds about **0.5°C** of warming, so cutting it is the **fastest way** to slow warming.
- The report warns of **tipping points** in the **ice sheets, the AMOC and the Amazon**.

India’s Climate Commitments

India **ratified** the **Paris Agreement** on **2 October 2016**.

- **First NDC (2015), for 2030**: a **33–35%** cut in emission intensity, **40%** non-fossil capacity and a **2.5–3 billion tonne** carbon sink.
- **Updated NDC (2022), for 2030**: a **45%** cut in emission intensity and **50%** non-fossil capacity.
- **NDC 3.0 (March 2026), for 2035**: a **47%** cut in emission intensity, **60%** non-fossil capacity and a **3.5–4 billion tonne** carbon sink.

India met the **intensity** and **non-fossil** targets of its first NDC early. At **COP26 (2021)**, it announced the **Panchamrit** and **Net Zero by 2070**. **Solar capacity** has grown from about **2 GW to over 160 GW** in 12 years.

Provisions and Concepts

- The **Paris Agreement** aims to keep warming **well below 2°C**, and preferably at **1.5°C**.

- **NDCs** and the **Global Stocktake** follow a **five-year cycle**. The first stocktake was completed at **COP28**.
- **Article 6** covers **carbon markets**. **CBDR-RC** stands for Common but Differentiated Responsibilities and Respective Capabilities.

India’s Position

- India supports a **fair transition** based on **CBDR-RC**.
- It seeks **climate finance** and **technology transfer** from developed countries.
- As a **Himalayan country**, it backs **loss and damage finance**.

Significance

- The UNEP report marks a shift from **preventing** a 1.5°C breach to **managing** it.
- India’s **early NDC achievements** strengthen its credibility in negotiations.
- The **per capita argument** supports India’s demand for **climate justice**.

Challenges

- **Fossil-fuel-dependent hosts** may weaken the summit’s focus on the transition.
- Trust between developed and developing countries is **low** because finance promises have not been kept.
- India’s targets are **intensity-based** and count **installed capacity**, not actual generation.

Way Forward

- Build a **balanced COP31 agenda** that covers adaptation finance and loss and damage.
- Developed countries must **deliver** on their finance commitments.
- India should speed up **grid upgrades and storage** and prioritise **methane cuts**.

Conclusion

- The world is entering an era of **climate overshoot**. COP31 must balance **ambition with fairness**, and India must combine rapid clean-energy growth with a firm stand on **climate justice**.

Box: Wild Species in News

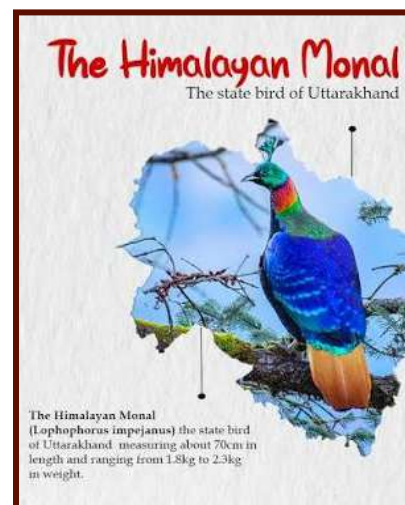
Leopardus tilcayo: New Wild Cat from Bolivia

- Scientists have identified a new wild cat, the **Tilcayo** (*Leopardus tilcayo*), in the **Yungas** cloud forest of **Bolivia**. The finding was published in *Current Biology*.
- It is the **first new living cat species** to be formally described in over a **century**.
- It is about **18 inches** long and weighs about **1.4 kg**, which makes it smaller than a domestic cat. It has **light brown fur** with **irregular rosettes**.
- Scat analysis suggests it eats **small rodents**, and camera traps show it is mostly **nocturnal**.
- DNA from 38 cats**, including **8 museum specimens**, showed that “**tiger cats**” are actually **five cryptic species**. The Tilcayo lineage separated about **1.4 million years ago**.



Himalayan Monal: Changing Calls

- A study by **HNBGU** found that monals living near **tourism and traffic** now use **higher-frequency calls**.
- Researchers used **passive acoustic monitoring** to compare the **quiet Madmaheshwar Valley** with the **busy Chopta Valley**, inside the **Kedarnath sanctuary**.
- The change may make it harder for males to **attract females** during the **breeding season**.
- The monal (*Lophophorus impejanus*) is a **pheasant**. It is the **State bird of Uttarakhand** and the **national bird of Nepal**, where it is called **danphe**.
- It lives at **2,100–4,500 m**. It is listed as **Least Concern** by the IUCN, but protected under **Schedule I**.



Pygmy Hog: Assam's Conservation Success

The pygmy hog (*Porcula salvania*) is the **world's smallest wild pig**, and the **only surviving species** of its genus.

- It is listed as **Endangered** by the IUCN and protected under **Schedule I** of the Wildlife (Protection) Act.
- The **Pygmy Hog Conservation Programme (1995)** has raised its numbers about **32-fold**. About **250** now live in the wild, and the target is **300 by 2040**.
- Its last natural population lives in the **Panbari grasslands** of **Manas National Park**. It was thought extinct until its **rediscovery in 1971**.
- It is an **umbrella species**, so protecting it also protects the **Bengal florican**, **hispid hare**, **hog deer** and **one-horned rhino**.



Striped Hyena: A Misunderstood Scavenger

- The striped hyena is a **scavenger** that feeds mainly on **carcass**, so it helps keep ecosystems **clean and disease-free**.
- Its global population is about **5,000–14,000**, and India may hold **1,000–3,000**, possibly one of the **largest** populations of any country.
- It is listed as **Near Threatened** by the IUCN and protected under **Schedule I**.
- India has **no official census** and **no national action plan** for it, so conservation remains **State-specific**.
- West Bengal** runs awareness drives against **superstition**, and **Tamil Nadu** has set aside **₹14 lakh** for its conservation.



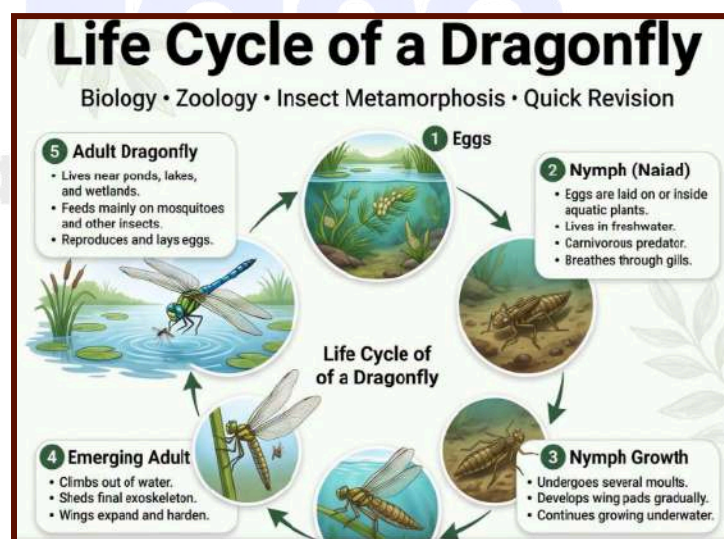
Spot-billed Pelican and Wetland Pollution

- A spot-billed pelican was photographed swimming past **plastic waste** in **Krishnampathy Lake, Coimbatore**, despite awareness campaigns.
- The bird (*Pelecanus philippensis*) is named for the **blue-grey spots** on its bill, and uses its **throat pouch** to scoop up fish.
- It is listed as **Near Threatened** by the IUCN, after being **upgraded from Vulnerable** in **2007**. It is protected under **Schedule II**.
- It is largely a **resident bird** of **peninsular India, Sri Lanka and Cambodia**, not a true migrant.
- Key breeding sites include **Koonthankulam** in Tamil Nadu (a **Ramsar site**), **Kokkarebellur** in Karnataka and **Uppalapadu** in Andhra Pradesh.



Dragonflies: Bioindicators of Ecosystem Health

- Dragonflies and damselflies belong to the order **Odonata**. India has about **600 species**, and new ones are often found in the **Northeast** and the **Western Ghats**.
- Their **nymphs live in water** and their **adults fly**, so their presence shows the health of both **wetlands and land**.
- A single nymph can eat about **100 mosquito larvae** a day, and adults hunt **crop pests** like **leafhoppers**.
- They have nearly **360° vision** and over **16 opsin genes**, compared with **4** in humans, which lets them see **ultraviolet** light.
- Pesticides like **fipronil** and **climate change** are reducing their numbers. The Western Ghats endemic **blue hawklet** is now becoming **rare**.



Great Indian Bustard

- The Environment Minister inaugurated a **GIB Soft Release Centre** at **Naliya, Kachchh**, in Gujarat.
- The **Great Indian Bustard** is one of the **heaviest flying birds** in the world, and is **Critically Endangered**, with **Schedule I** protection.
- Its main habitats are in **Rajasthan and Gujarat**, and it is a **flagship species** for India's **grasslands**.
- The Minister also launched **Sayara Van Kavach**, a **Miyawaki-method** forest of over **10,000 saplings** from **47 native species**.
- He also reviewed **mangrove planting** under **MISHTI** at **Jakhau**, and in the **Kori Creek** and **Sir Creek** areas.



Rare Turtles at Risk in Haryana

- Sewage pollution** in a pond at **Kajalheri village**, inside the **Shri Guru Gorakhnath Community Reserve**, is harming about **150–200 rare turtles**.
- The turtles suffer from **infections and blindness**. Many are **killed on roads** while leaving for cleaner water, and **stray dogs and cattle** destroy their nests.

- The **red-crowned roofed turtle** (*Batagur kachuga*) is **Critically Endangered**, and its only viable habitat is the **Chambal River**.
- The **Indian peacock softshell** (*Nilssonina hurum*) and **Indian softshell** (*Nilssonina gangetica*) turtles are both **Endangered**.
- All three species have **Schedule I** protection. The red-crowned roofed turtle moved to **CITES Appendix I** at **CoP19 (2022)** on **India's proposal**.



Box: Protected Areas in News

Management Effectiveness Evaluation of Tiger Reserves (MEE-TR) 2026

- The **6th cycle** of MEE-TR was launched, covering all **58 Tiger Reserves**.
- The **Technical Manual 2026** adds **Solid Waste Management** as a **new criterion**. It covers waste from **forest chowkis, tourism and wildlife rescue centres**.
- MEE is run by the **NTCA** with the **WII**, using the **IUCN–WCPA** framework of **six elements**: context, planning, inputs, processes, outputs and outcomes.
- It began in **2006** after tigers **disappeared from Sariska**. Earlier cycles in **2006, 2010, 2014, 2018 and 2022** covered **28, 39, 43, 50 and 51** reserves.
- A **Tiger Reserve** has an **involute core** (Critical Tiger Habitat) and a **buffer zone** that allows regulated tourism.

Kedarnath Wildlife Sanctuary

- It is also called the **Kedarnath Musk Deer Sanctuary**, and lies in the **Chamoli and Rudrapurayag** districts of **Uttarakhand**.
- Set up in **1972** over about **975 sq km**, it is the **largest protected area** in the **western Himalaya**.
- It protects the endangered **Himalayan musk deer**, along with the **monal, thar and snow leopard**.

- It lies in the upper catchment of the **Alaknanda and Mandakini** rivers.
- The **Nainital High Court (2012)** set noise limits of **50 dB by day** and **40 dB by night** near protected areas, and the **NGT** ordered noise-control steps here in **2015**.



Muthanga, Wayanad Wildlife Sanctuary (Kerala)

- The **Muthanga** range is part of the **Wayanad Wildlife Sanctuary**, declared in **1973** over about **344 sq km**.
- It lies within the **Nilgiri Biosphere Reserve**, India's **first** biosphere reserve (**1986**), in the **Western Ghats**.
- It borders **Bandipur** (Karnataka) and **Mudumalai** (Tamil Nadu) tiger reserves, forming one of India's most important **elephant habitats**.
- A **Wayanad court** delivered its verdict on the **2003 Muthanga agitation**, when landless **Adivasis** occupied forest land.
- **Sanctuaries** may allow some **human rights and activities**, while **national parks** allow **none**. **Kerala** has **no Fifth Schedule** area.



Manas National Park (Assam)

- Manas is a **UNESCO World Heritage Site**, a **Tiger Reserve**, a **Biosphere Reserve** and an **Elephant Reserve**.
- It is the last natural home of the **pygmy hog**, in the **Panbari grasslands**.
- Nearby **Orang National Park** is called “mini **Kaziranga**” for its **one-horned rhinos**.
- Restoring buffer zones around **Manas, Orang** and **Sonai Rupai Wildlife Sanctuary** is key to **pygmy hog** recovery.



Valmiki Tiger Reserve (Bihar)

- It lies on the banks of the **Gandak River** at **Valmikinagar**, in **West Champaran**.
- It adjoins **Chitwan National Park** in **Nepal**, which lies along the **Narayani** (the Gandak's Nepali name).
- The **Gandak barrage** at Valmikinagar, built under a **1959 India–Nepal agreement**, provides **irrigation and hydropower**.



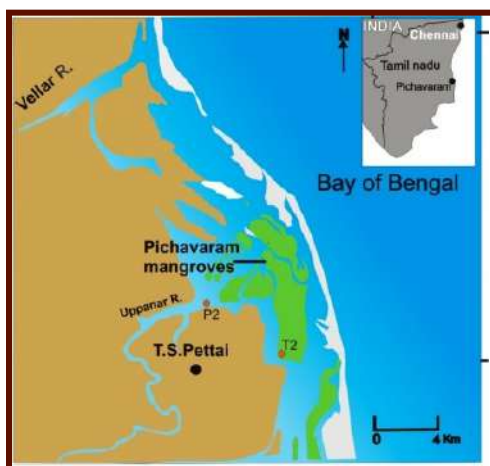
Community and Conservation Reserves

- These categories were added by the **Wildlife (Protection) Amendment Act, 2002**, under **Sections 36A–36D**.
- A **Community Reserve** is on **community or private land**, while a **Conservation Reserve** is on **government land**.
- India's first **Community Reserve** was **Keshopur–Miani** in **Punjab**, and its first **Conservation Reserve** was **Tiruppadaimarathur** in **Tamil Nadu**.
- They act as **buffer zones** and **wildlife corridors** between national parks and sanctuaries.
- The Haryana turtle pond lies in the **Shri Guru Gorakhnath Community Reserve**.

Box: Wetlands, Mangroves and Ramsar Sites

Pichavaram Mangroves: Economic Valuation

- A study valued the **Pichavaram** mangrove ecosystem in **Tamil Nadu** at **₹2,485.38 crore**, or about **₹1.83 crore per hectare**.
- The forest lies near **Chidambaram** in **Cuddalore** district, between the **Vellar and Coleroon (Kollidam)** estuaries.
- Mangroves are a major **“blue carbon”** sink, storing carbon in both **plants and soil** for long periods.
- They provide **provisioning** services (fish, timber, honey), **regulating** services (coastal protection, carbon storage), **supporting** services (fish nurseries) and **cultural** services (ecotourism).
- Mangroves have **stilt roots** and **pneumatophores** (breathing roots), which help them survive in **saline, waterlogged** soil.



Mangrove Initiatives

- **MISHTI** (Mangrove Initiative for Shoreline Habitats and Tangible Incomes) was launched in the **Union Budget 2023–24**.
- India is part of the **Mangrove Alliance for Climate (MAC)**.
- India's mangroves are protected under the **Coastal Regulation Zone (CRZ)** norms.
- The **Sundarbans**, shared by **India and Bangladesh**, is the **world's largest** mangrove forest and a **UNESCO World Heritage Site**.

Other Wetlands in News

- **Krishnampathy and Vellalore** lakes in **Coimbatore** are important **pelican** habitats now facing **plastic pollution**.
- **Koonthankulam** in **Tirunelveli**, Tamil Nadu, became a **Ramsar site** in **2021**. It is the largest **waterbird breeding** site in South India, and is protected by **local villagers**.
- **Vembanad** in Kerala, a **Ramsar site**, could be affected by the proposed **Pamba–Achankovil–Vaippar** river link → See Part B.

About Ramsar and Wetland Protection

- The **Ramsar Convention** was signed in **1971** at **Ramsar, Iran**, and **World Wetlands Day** is observed on **2 February**.
- Wetlands are called the **“kidneys of the landscape”**, as they **purify water, recharge groundwater** and **control floods**.
- The **Montreux Record** lists Ramsar sites facing **ecological threats**. India's **Keoladeo** and **Loktak** have featured on it.
- India protects wetlands through the Wetlands (Conservation and Management) Rules, 2017.

Box: International Conventions

UNFCCC and the COP Process

- The **UNFCCC** was adopted at the **1992 Rio Earth Summit** and came into force in **1994**. Its **COP** takes decisions **by consensus**.
- **COP28 (2023)** first called for a **“transition away from fossil fuels”**. **COP30 (Belém, 2025)** first accepted that a **1.5°C overshoot** is likely.
- **COP31** will be held in **Antalya, Türkiye** (November 2026), with **Australia** leading the negotiations.

Paris Agreement: India's NDC Journey

- It was adopted on **12 December 2015** and came into force on **4 November 2016**. India **ratified** it on **2 October 2016**.
- It aims to keep warming **well below 2°C**, and preferably at **1.5°C**. **NDCs** are renewed every **5yrs**.
- NDC 3.0 (25 March 2026)** targets a **47%** cut in emission intensity, **60%** non-fossil capacity and a **3.5–4 billion tonne** carbon sink by **2035**.
- Article 6** covers **carbon markets**. **Article 8** covers **loss and damage** but creates **no liability**.

Vienna Convention, Montreal Protocol and Kigali Amendment

- The **Vienna Convention (1985)** set the framework for ozone protection. The **Montreal Protocol (1987)** set **binding phase-out targets**.
- India is phasing out **HCFCs** under **Stage III (2025–2030)** of its HCFC Phase-out Management Plan.
- The **Kigali Amendment** targets **HFCs**, which harm the climate but not the ozone layer. India **ratified** it in **2021** and committed to an **85% cut** by **2047**.

Biodiversity Agreements: CBD, Nagoya and Kunming–Montreal

- The **CBD (1992)** covers conservation, sustainable use and **benefit-sharing**.
- The **Nagoya Protocol** deals with **Access and Benefit-Sharing (ABS)**.
- The **Kunming–Montreal GBF (COP15)** sets the “**30×30**” target: protecting **30% of land and sea** by **2030**.

BBNJ Agreement: The High Seas Treaty

- The **BBNJ Agreement [S]** protects marine biodiversity **beyond national jurisdiction**, about **two-thirds of the oceans**.
- It is a **legally binding treaty** under **UNCLOS**.

CITES and Ramsar

- CITES** regulates international **wildlife trade**. **Appendix I** bans commercial trade.
- India's proposal to move the **red-crowned roofed turtle** to **Appendix I** was accepted at **CoP19 (2022)**.
- The **Ramsar Convention (1971)** protects **wetlands of international importance**.

Box: Environmental Institutions

National Green Tribunal (NGT)

- It was set up under the **NGT Act, 2010**. India is the **third country**, after **Australia and New Zealand**, to have a dedicated environmental court.
- Its **Principal Bench** is in **New Delhi**, with zonal benches at **Pune, Bhopal, Chennai and Kolkata**.
- It aims to decide cases within **6 months** and is **not bound by the CPC**.
- It applies the **precautionary** and **polluter pays** principles. **Appeals** lie with the **Supreme Court** within **90 days**.
- The **Wildlife (Protection) Act**, the **Forest Rights Act** and the **Indian Forest Act** fall **outside** its jurisdiction.

Commission for Air Quality Management (CAQM)

- It was made statutory under the **CAQM Act, 2021**, and replaced the **EPCA**.
- It covers **Delhi, Punjab, Haryana** and the **NCR parts of UP and Rajasthan**. **Appeals** lie with the **NGT**.
- Farmers** are **exempt from jail** for **stubble burning**.

Central Pollution Control Board (CPCB)

- It is a **statutory body** under the **Water Act, 1974**, and is also empowered under the **Air Act, 1981**.
- It works under the **MoEFCC** and sets **pollution standards**.

National Tiger Conservation Authority (NTCA)

- It is a **statutory body** under **Chapter IV-B** of the **Wildlife (Protection) Act** (added in **2006**).
- It is **chaired** by the **Union Environment Minister**.
- It conducts the **All-India Tiger Estimation** every **four years**.

National Biodiversity Authority (NBA)

- It was set up under the **Biological Diversity Act, 2002**, and is based in **Chennai**.
- The governance structure has **three tiers**: the **NBA, State Biodiversity Boards** and **BMCs**.

- **BMCs prepare People's Biodiversity Registers.**

International Big Cat Alliance (IBCA)

- It was launched on **9 April 2023** at **Mysuru** to mark **50 years of Project Tiger**.
- It is based in **New Delhi** and became **treaty-based** on **23 January 2025**.
- It covers **seven big cats**: tiger, lion, leopard, snow leopard, cheetah, jaguar and puma. **Five** of them are found in India.

Box: Conservation Quick Facts

PRAMAAN: India's First Forest and Wood Certificates

- India's first **PRAMAAN certificates** were awarded under the **Indian Forest and Wood Certification Scheme (IFWCS)**. They went to **APFDC (33,000 ha)** and an **Odisha bamboo farmer**.
- **IIFM Bhopal** runs the scheme. Certification is done by bodies accredited by **NABCB (QCI)**.
- The scheme covers **Forest Management, Trees Outside Forests and Chain of Custody**, and helps exporters meet **deforestation-free** sourcing rules.

World Ozone Day 2026 Initiatives

- India held the **32nd World Ozone Day** in **Mumbai**, on the theme "**Global Action for a Cooler Planet**".
- It launched a **Net Zero Portal** to track climate commitments, and an **NAPCC Dashboard**.
- **12 RAC manufacturers** adopted **248 ITIs** to train technicians in **low-GWP** cooling technologies.



PART F : SCIENCE, TECHNOLOGY AND DIGITAL SOVEREIGNTY

Full Articles - Mains Relevance

Semiconductors: Semicon 2.0 and SEMICON India 2026

Why in News

- PM Modi inaugurated **SEMICON India 2026** at **Yashobhoomi, New Delhi**, on **17 September**. The theme was "**Silicon to Systems: Building the Ecosystem**".
- The event follows the Cabinet's approval of **Semicon 2.0** on **15 July 2026**, with an outlay of **₹1,27,500 crore**.

More on the News

- Under **Semicon 1.0**, **12 units** have been approved across **six States**, with investment commitments of over **₹1.64 lakh crore**.
- Several of these units have started **commercial production**, which marks India's shift from **assembling electronics to making chips**.
- India joined the **Pax Silica coalition** in **February 2026** to secure a **trusted chip supply chain**.
- The event drew over **600 exhibitors**, including **300 international companies**.

About Semiconductors

- A **semiconductor** is a material whose **electrical conductivity can be controlled**.
- It forms the basis of **transistors** inside chips.
- **Silicon**, obtained from **silica**, is the most widely used material.
- Chips power **AI, 5G, EVs, satellites and defence systems**, which is why semiconductors are called a "**foundational industry**".

India's Semiconductor Missions

- **Semicon 1.0 (December 2021, ₹76,000 crore)**: It approved **one silicon fab, one silicon carbide fab, one GaN micro-LED display fab and nine ATMP/OSAT units** across **Gujarat, Assam, UP, Odisha, Punjab and AP**.
- **Semicon 2.0 (July 2026)**: It covers the full value chain through **six pillars**: **R&D, chip design, machines and materials, more fabs, talent and ATMP/OSAT**.

Supporting Policies

- The **National Policy on Electronics (2019)** is the overall framework.
- **SPECS, EMC 2.0** and **PLI schemes** support electronics manufacturing.
- **100% FDI** is allowed in electronics manufacturing.

Key Data

- India's chip demand may reach **\$110 billion by FY2030**.
- **Taiwan** makes over **60%** of the world's chips and about **90%** of advanced chips.
- India has nearly **20%** of the world's **chip-design workforce**.

Significance

- It reduces dependence on **Taiwan, South Korea and China**.
- It strengthens **strategic autonomy**. **SCL Mohali** makes chips for ISRO missions such as **Chandrayaan-3**.
- It creates **high-skill jobs** and positions India as a **trusted supply-chain partner**.

Challenges

- **Fabs** are extremely **capital- and water-intensive**.
- India depends on **imported equipment and specialty chemicals**.
- There is a **skills gap in fabrication**, as distinct from design.

Way Forward

- Start with **mature-node fabs** and move to advanced nodes later.
- Build **domestic supply chains** for gases, chemicals and equipment.
- Expand **university-industry training** and deepen partnerships with the **US, Japan, the EU and Taiwan**.

Conclusion

- India's semiconductor mission is moving from **policy to production**. Sustained investment in **talent, supply chains and infrastructure** will decide whether India becomes a **global chip hub**.

EOS-05 and GSLV-F17: India's First Geosynchronous Imaging Satellite

Why in News

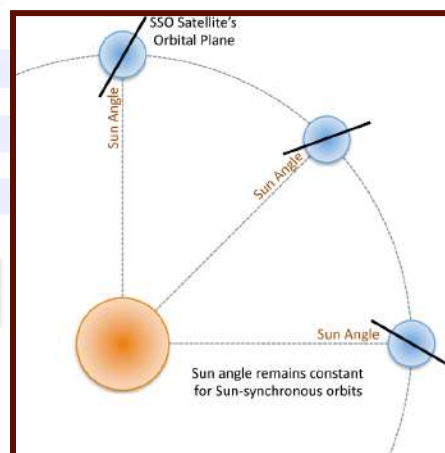
- **ISRO** successfully launched **EOS-05** on **4 September 2026** aboard **GSLV-F17**, from **Sriharikota**.
- It is India's **first dedicated imaging satellite in geosynchronous orbit**, about **36,000 km** above the Earth.

More on the News

- The satellite was placed in a **sub-geosynchronous transfer orbit**.
- It has a **mission life of 10 years**, and has been nicknamed India's **"eye in the sky"**.

About EOS-05

- Most of India's earlier **Earth observation** satellites operate in **Low Earth Orbit (LEO)** or **Sun-Synchronous Orbit (SSO)**. They pass over a place only **periodically**, with gaps of days.
- EOS-05, in **geosynchronous orbit**, stays fixed relative to the Earth. It can therefore watch the same region **continuously**, providing **real-time, high-frequency** images.



Its main uses include:

- **Agriculture:** crop and forest monitoring.
- **Disaster management:** tracking **floods, cyclones, forest fires** and fast-changing weather.
- **Environment:** monitoring **oceans, water and natural resources**.
- **Urban planning and infrastructure**.
- **Security:** situational awareness across India's **land and maritime borders**.

About the GSLV

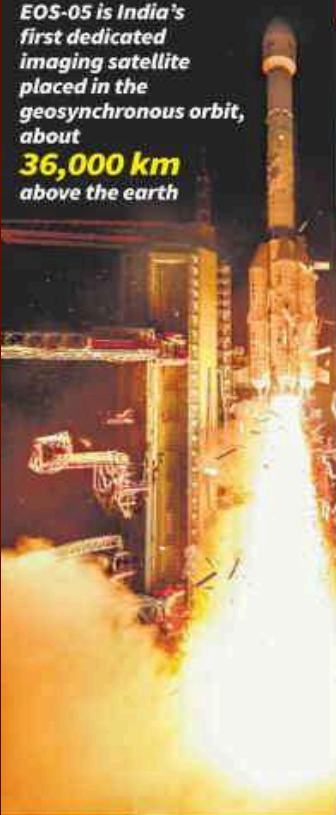
The **Geosynchronous Satellite Launch Vehicle (GSLV)** is a **three-stage** rocket that carries heavier satellites to **Geosynchronous Transfer Orbit (GTO)**.

- **Stage 1** uses **solid fuel**, with **four liquid strap-on boosters**.
- **Stage 2** uses **liquid fuel**, powered by the **Vikas engine**.
- **Stage 3** is the **indigenous cryogenic upper stage**, powered by the **CE-7.5 engine**.

It can carry about **2,500 kg** to GTO. The GSLV was once nicknamed the “**naughty boy**” for its early failures. After consistent successes, ISRO scientists now call it a “**smart boy**”.

A **cryogenic engine** uses **liquid hydrogen** (stored at about -253°C) as fuel and **liquid oxygen** (about -183°C) as oxidiser, which gives **higher thrust and efficiency**. India developed it **indigenously** after the US blocked Russian technology transfer under the **Missile Technology Control Regime (MTCR)**.

EOS-05 is India's first dedicated imaging satellite placed in the geosynchronous orbit, about **36,000 km above the earth**



■ EOS-05 replaces the EOS-03 satellite lost in the **unsuccessful GSLV-F10 mission** in August 2021

Eye in the sky



Wonder awaits: A child watches the EOS-05 launch through binoculars. PTI

At 2,367 kg, EOS-05 is the heaviest satellite launched by the GSLV

Key purposes: Near real-time imagery will aid agriculture, environment monitoring, and disaster management

■ **Strategic data** from the geo platform will support “national activities”

Lifespan: The satellite has an operational life of **nine years** and is equipped with multi-band operating capabilities

■ This is the **19th GSLV mission** and the 107th launch from Sriharikota



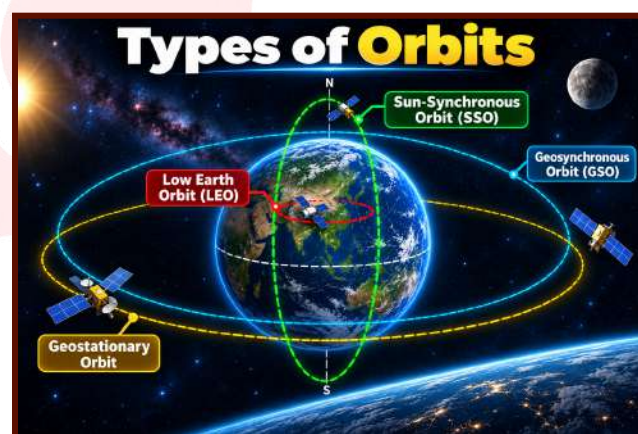
■ **3-stage, 51.7 metre GSLV**, with its third stage being cryogenic, has a lift-off mass of 420.5 tonnes

PSLV vs GSLV

- The **PSLV** carries **lighter** satellites to **LEO and polar orbits**, has **four stages** and **no cryogenic engine**, and is called ISRO's “**workhorse**”.
- The **GSLV** carries **heavier** satellites to **GTO**, has **three stages**, and uses a **cryogenic upper stage**.
- **Chandrayaan-1** was launched by the **PSLV**, while **Chandrayaan-2 and -3** used the more powerful **LVM3**.

Types of Orbit

- **Low Earth Orbit** lies about **180–2,000 km** above the Earth.
- **Sun-Synchronous Orbit** is a **polar orbit** that passes over a place at the **same local time** each day.
- A **geosynchronous orbit**, at about **36,000 km**, takes **24 hours** to complete one orbit.
- A **geostationary orbit** is a geosynchronous orbit directly above the **equator**, where a satellite appears **fixed** in the sky.



Significance

- Continuous imaging greatly improves **disaster early warning** and response.
- It strengthens **border and maritime surveillance**.
- It gives India **real-time data** for **agriculture and resource management**.
- The launch confirms the **reliability** of the GSLV and India's **cryogenic** technology.

Challenges

- Imaging from **36,000 km** gives **lower resolution** than satellites in LEO.
- **Space weather** and **orbital debris** pose risks over a **10-year** mission.

- Converting satellite data into **timely local action** depends on **ground-level capacity**.

Way Forward

- Integrate EOS-05 data with **IMD, NDMA and State disaster agencies**.
- Build a **constellation** that combines geosynchronous and low-orbit imaging.
- Open the data, where safe, to **start-ups and researchers** for new applications.

Conclusion

- EOS-05 gives India a **constant watch** over its territory and seas. It strengthens both **disaster resilience** and **national security**, while confirming the maturity of India's **launch capability**.

Quantum-Safe Communication: C-DOT's Indigenous Products

Why in News

- C-DOT unveiled **14 indigenous quantum products** on its **43rd Foundation Day**.
- The products use **Quantum Key Distribution (QKD)** and **Post-Quantum Cryptography (PQC)** to secure India's networks against future **quantum computing** threats.

About the Quantum Threat

- Current encryption, such as **RSA**, relies on maths problems that ordinary computers would take **thousands of years** to solve.
- A powerful **quantum computer** could solve them quickly, which would make most current encryption **unsafe**.
- Adversaries can also collect encrypted data now and decrypt it later, a threat known as "**harvest now, decrypt later**".

Quantum computers use **qubits**, which can exist as **0 and 1 at the same time**. This property, called **superposition**, lets them solve certain problems far faster than classical computers.

About C-DOT

The **Centre for Development of Telematics (C-DOT)** is the premier **telecom R&D** centre of the **Department of Telecommunications**, under the **Ministry of Communications**. It was established in **1984**, and focuses on **indigenous** telecom research and innovation.

Provisions and Missions

- The **National Quantum Mission** was approved in **2023**, to build capacity in **quantum computing, communication, sensing and materials**.
- **CERT-In** is India's nodal agency for **cybersecurity incidents**.
- The **Digital Personal Data Protection Act, 2023** sets rules for **handling personal data**.

Significance

- Quantum-safe systems protect **strategic and financial** data from **future decryption**.
- Indigenous products reduce dependence on **foreign security technology**.
- India joins a small group of countries building **quantum communication** capacity.
- The products support India's broader **digital sovereignty**.

Challenges

- **QKD** is costly, and works only over **limited distances** without trusted relay nodes.
- Upgrading **legacy systems** to PQC takes **time and money**.
- India has a **shortage** of **quantum scientists and engineers**.
- Standards are still **evolving** worldwide.

Way Forward

- Begin a **phased migration** of **government, defence and banking** systems to PQC.
- Use **QKD** for the most **sensitive** links, such as defence networks.
- Build **quantum skills** through the **National Quantum Mission**.
- Develop **Indian standards** aligned with global PQC standards.

Conclusion

- Quantum-safe communication is essential to protect India's **digital future**. C-DOT's products are an important step, but they must be backed by **wide adoption** and **skilled manpower**.

Time Sovereignty: IST, NavIC and “One Nation, One Time”

Why in News

- On **27 August 2026**, the Centre notified the **Legal Metrology (Indian Standard Time) Rules, 2026**.
- The Rules make **IST** the **single official time reference** for all legal, administrative and commercial purposes. They will come into force after **180 days**.

More on the News

- An **inter-ministerial committee** found that some telecom and internet services were using **foreign time sources** such as **GPS**.
- The Rules allow **NavIC** to be used for **secure time dissemination**.
- In July 2026, a **White Rabbit Technology**-based **IST Dissemination Network** was commissioned in **Bengaluru**.
- The move aims to protect **critical infrastructure** from **cyber-attacks**.

Why a Common Time Reference Matters

- Banking and digital payments** need accurate timestamps for every transaction.
- Telecom networks, railways and power grids** depend on exact timing.
- Legal records** need a legally recognised time standard.

When systems use different time sources, small differences creep in and cause errors in **transactions and records**.

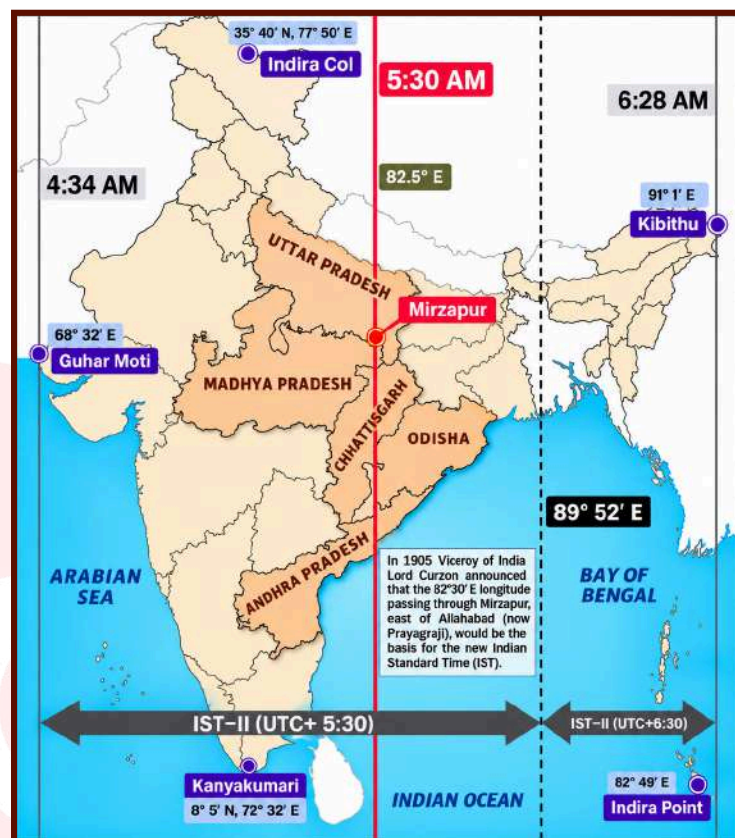
About IST

- IST is **UTC + 5:30**.
- It is maintained by **CSIR-NPL** using **atomic clocks** and is accurate to within **3 nanoseconds** of UTC.
- It is distributed through **NTP servers**. The “**IST®**” trademark was registered in **2024**, but the standard was **never legally mandated** until now.
- IST is based on **82.5° E**, which passes near **Mirzapur (UP)**.

Role of NavIC

- ISRO** provides nanosecond-level traceability to IST through **NavIC**.

- Moving from **GPS** to **NavIC** reduces the risk of **foreign disruption** during a crisis.



Significance

- It makes **digital transactions and records** more accurate.
- It strengthens **national security** by reducing dependence on **GPS**.
- It promotes **indigenous technology** and **strategic autonomy**.

Challenges

- Operators must upgrade their systems within a tight **180-day** window.
- Many existing devices are **built around GPS**.
- Smaller businesses** may not be aware of the Rules.

Way Forward

- Give **technical and financial support** to smaller operators.
- Extend the **Bengaluru model** to other regions.
- Strengthen **NavIC infrastructure** and run **awareness programmes**.

Conclusion

- “One Nation, One Time” turns **accurate time** into a **legally protected national asset**. Its success will depend on **smooth adoption** across sectors and a **reliable NavIC** backbone.

Nuclear Energy: Thorium, the Three-Stage Programme and the SHANTI Act

Why in News

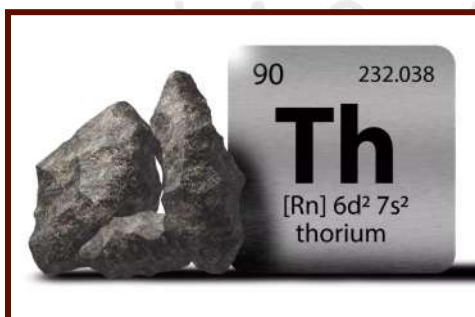
- Nuclear scientist **Anil Kakodkar** has called for early use of **thorium-based fuel** in **PHWRs** to reduce dependence on imported uranium.
- PM Modi highlighted reforms under the **SHANTI Act, 2025**, and private players asked for “**green energy**” status for nuclear power.

More on the News

- Kakodkar also suggested a **HALEU–thorium fuel mix**.
- The **SHANTI Act** opens the nuclear sector to **private companies and JVs** under government licence.
- Private players want green status so that nuclear projects can access **green bonds** and **blended finance**.
- India targets **100 GW** of nuclear capacity by **2047**, up from about **8.8 GW** today.

About Thorium

Thorium (Th-232) is **fertile, not fissile**. It must absorb a neutron to become fissile **U-233** ($\text{Th-232} \rightarrow \text{Pa-233} \rightarrow \text{U-233}$).



- It is **3–4 times more abundant** than uranium.
- India holds about **25%** of the world's thorium but only **1–2%** of its uranium.
- It comes mainly from **monazite** in the **beach sands** of AP, Tamil Nadu, Odisha and Kerala. **IREL** mines it.



India's Three-Stage Nuclear Programme

Homi J. Bhabha designed the programme in the **1950s**. Its aim is to use India's small uranium reserves first and its large thorium reserves later.

- **Stage I – PHWRs:** These reactors use **natural uranium** as fuel and **heavy water** to control and cool the reaction. They produce **plutonium (Pu-239)** as a by-product.
- **Stage II – Fast Breeder Reactors:** These reactors use the **plutonium** from Stage I as fuel and **produce more fuel than they consume**. They are cooled by **liquid sodium**. The **500 MWe PFBR at Kalpakkam** reached **first criticality** on **6 April 2026**.
- **Stage III – Thorium reactors:** These reactors will run on **thorium** and **U-233**, using designs such as BARC's **AHWR**. This stage is still a **long-term goal**.

About the SHANTI Act, 2025

The Act repeals the **Atomic Energy Act, 1962** and the **CLND Act, 2010**.

- **Private companies** can build, own and operate nuclear plants under **licence**.
- **Enrichment, heavy water** and **spent-fuel management** stay with the **government**.

- The **AERB** gets **statutory status**.
- **Operator liability** is capped and **supplier liability** is removed.

Significance

- Thorium can give India **long-term energy security** from its own resources.
- Nuclear power provides **clean baseload electricity** for **Net Zero 2070**.
- **Private investment** can speed up slow capacity growth.

Challenges

- **Stage III** depends on the success of **Stage II**.
- Projects have **long gestation periods** and face **site-selection** problems.
- Removing **supplier liability** raises **safety and accountability** concerns.

Way Forward

- Speed up **fast-breeder deployment** after the PFBR's success.
- Test **thorium fuels** in existing PHWRs.
- Give nuclear power access to **green finance**.
- Strengthen the **AERB's independence** and build **public trust**.

Conclusion

- India's thorium vision depends on completing all **three stages** of Bhabha's plan. The **SHANTI Act** and green-finance access could speed up progress, if backed by strong **safety and regulation**.

India's Homegrown Innovation Ecosystem: From Importing Technology to Inventing It

Why in News

- India is moving from **importing technology** to **creating it**, driven by **public research, corporate R&D** and **deep-tech start-ups**.
- The **₹1 lakh crore RDI Scheme**, approved in **2025**, aims to boost **private-sector research**.

More on the News

- India's **Global Innovation Index** rank improved from **66th (2019)** to **38th (2025)**.
- **Deep-tech start-ups** have attracted about **\$27.9 billion** since 2016.

- **Patent grants** fell to **33,504** in 2024–25, from **1,03,057** in 2023–24, even though filings rose.
- India has about **2.4 lakh patents in force**, compared with **5.7 million in China**.

How India's Innovation Journey Evolved

- **State-led science (1940s–1980s)**: The government built institutions such as **CSIR, DRDO and ISRO**.
- **Technology denial**: Being denied a supercomputer led to **PARAM**, and the blocked deal led India to build its own **cryogenic engine**.
- **Liberalisation (1991–2010s)**: India led in **IT services** but owned few products or patents. It adopted **product patents in 2005** under **TRIPS**.
- **Innovation push (2016 onwards)**: This phase brought **Startup India, the Atal Innovation Mission, the ANRF (2023)** and the **RDI Scheme (2025)**.

The Three Pillars of Innovation

- **Public research**: **DRDO** mastered **GaN (Gallium Nitride) chip technology** in 2023, which had been denied to India. It is used in **5G/6G and EV chargers**.
- **Corporate R&D**: The **Bharat 6G Alliance** aims for **10% of global 6G patents** by 2030. **Jio** is among the world's **top 20 international patent filers**.
- **Deep-tech start-ups**: In space, **Pixxel, Skyroot and Agnikul**. In health, **NexCAR19**, India's **first indigenous CAR-T therapy**, at about **one-tenth of the usual cost**.

Government Support

- The **ANRF (ANRF Act, 2023)** is the **apex research-funding body**.
- The **RDI Scheme** gives **low-interest, long-term loans** for private R&D.
- **Frontier missions** include the **Semiconductor, Quantum and IndiaAI Missions**.
- Patent fees are lower for start-ups, and examination is faster.

Significance

- Owning **core technology** protects India from **export controls**.
- **Patents and standards** earn **royalties** and help India escape the **middle-income trap**.
- **Low-cost innovations** widen access to healthcare.

Challenges

- India has **many patent filings but few grants**.
- **Patent office capacity** is limited.
- **R&D spending** is only about **0.64% of GDP**, and business funds just **41%** of it, compared with **77% in China**.
- **Section 3(k)** of the Patents Act creates uncertainty for **AI and software start-ups**.

Way Forward

- Hire **more examiners** to speed up patent grants.
- Raise **R&D spending** towards **2% of GDP**, led by the private sector.
- Create a simple framework for **commercialising public research**, similar to the US Bayh-Dole Act.
- Use **government procurement** to give start-ups their first customers.

Conclusion

- India's innovation story is moving from **promise to practice**, as labs, companies and start-ups begin to work together. Faster **patent grants**, higher **R&D spending** and better **commercialisation** will decide whether India becomes a true **source of new technology**.

Box: Strategic and Safety Technology

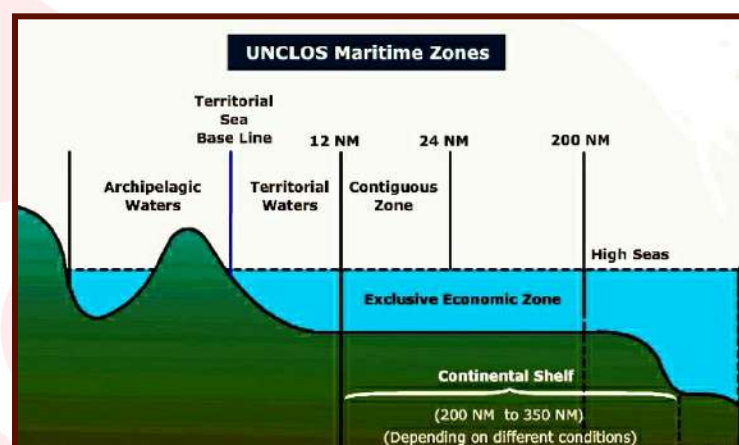
Kavach 4.0: India's Indigenous Train Protection System

- **Kavach Version 4.0** was commissioned for the first time on **South Central Railway**, upgrading from **Version 3.2**.
- It covers **108 route km** on the **Malkajgiri-Kamareddi** section (Hyderabad Division).
- **Kavach** is an indigenous **Automatic Train Protection (ATP)** system developed by Indian Railways with the **RDSO**.
- It **applies the brakes automatically** if the loco pilot fails to, prevents **Signal Passing at Danger (SPAD)** and supports safe running in **fog**.
- It requires **SIL-4** certification. Its components include **Station Kavach**, **RFID tags**, **telecom towers** and **Loco Kavach**.

Deep-Sea Mining: ISA Contracts

- India holds **three ISA exploration contracts** covering about **95,000 sq km** of seabed.

- In **1987**, India became the **first Pioneer Investor**, for polymetallic nodules in the **Central Indian Ocean Basin**.
- In **2025**, it signed a **15-year contract** for the **Carlsberg Ridge**, becoming the first country with **two polymetallic sulphide contracts**.
- It has applied to explore **cobalt-rich crusts** on the **Afanasy-Nikitin Seamount**.
- **Polymetallic nodules** contain **manganese, nickel, copper and cobalt**. **Polymetallic sulphides** form near **hydrothermal vents** and contain **copper, zinc, gold and silver**.
- The **ISA** is based in **Kingston, Jamaica**. Its **mining code** has not yet been finalised.



The Deep Ocean Mission and MATSYA-6000

- The **Deep Ocean Mission (MoES)** was approved in **June 2021** with **₹4,077 crore** for five years.
- It has **six components**, including deep-sea mining, a **manned submersible** and **ocean climate services**.
- Under **Samudrayaan**, **NIOT, Chennai** is building **MATSYA-6000**, a **three-person submersible** for depths of **6,000 m**.
- It offers **12 hours** of normal operation and **96 hours** of emergency endurance.

ORV Sagar Manthan

- India's **first indigenous advanced ocean research vessel** was launched at **Kolkata** on **9 September 2026**.
- It was built by **GRSE** for **NCPOR (MoES)** under **Vertical-4** of the Deep Ocean Mission, with delivery due in **2028**.
- It will replace the 43-year-old **ORV Sagar Kanya**.
- It will explore **hydrothermal sulphide deposits** and study **polar glaciers and climate**.

OptoSAR: All-Weather Satellite Imaging

- The **TDB (DST)** gave **₹63.84 crore** to **GalaxEye Space** under the **RDI Fund**.
- The satellite will be **multisensor**, with a resolution **finer than 0.5 m**.
- **OptoSAR** combines **SAR**, which sees through clouds and darkness, with **Electro-Optical (EO)** imaging.
- The project will take the technology from **TRL-6** to **TRL-9**, that is, from an advanced prototype to a deployment-ready system.

Box: S&T Quick Hits

Space and Astronomy

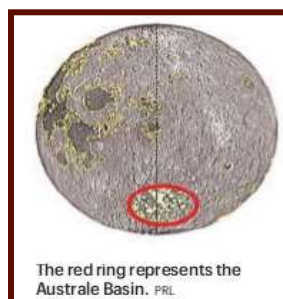
Nancy Grace Roman Space Telescope

- NASA launched it on a **SpaceX** rocket on **30 August** to study **dark matter, dark energy and exoplanets**.
- It operates from **Lagrange Point 2 (L2)**, about **1.5 million km** from Earth, the same zone as the **James Webb Telescope**.
- **Lagrange points** are positions where the gravity of two large bodies balances. India's **Aditya-L1** sits at **L1**.



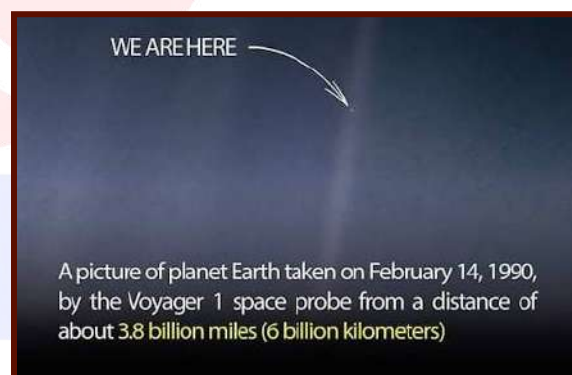
Austrole Basin: A Hidden Lunar Basin

- Indian scientists used **Chandrayaan-1** data from NASA's **Moon Mineralogy Mapper** to confirm a hidden impact basin.
- It may be older than the **South Pole–Aitken Basin**, which formed over **4 billion years** ago.



Voyager Missions and the Golden Record

- **Voyager 1 and 2 (1977)** are humanity's most distant operating probes. **Voyager 1** will reach **one light-day** from Earth in November.
- **Voyager 2** is the only spacecraft to have visited all **four outer planets**. **Voyager 1** has entered **interstellar space**.
- Both carry a **Golden Record** with greetings in **55 languages**, including several Indian languages, and the song "**Jaat Kahan Ho**" by **Kesarbai Kerkar**.
- Voyager 1's "**Pale Blue Dot**" image, a phrase made famous by **Carl Sagan**, showed Earth as a tiny speck.



Health and Biotechnology

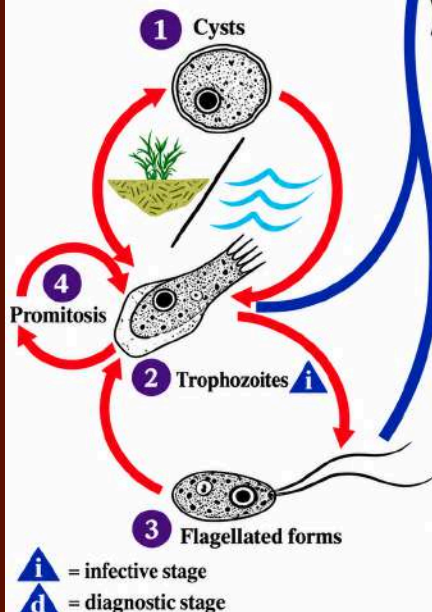
Brain-Eating Amoeba (*Naegleria fowleri*)

- Scientists found that it seeks **narrow spaces** and moves in **straight lines**, which helps it travel from the nose to the brain.
- It lives in **warm freshwater and soil** and causes **Primary Amoebic Meningoencephalitis (PAM)**, which is fatal in over **95%** of cases.
- Infection happens when contaminated water goes **up the nose**. **Drinking the water does not cause it**.
- It reaches the brain through the **olfactory nerve** and the **cribriform plate**, and mostly affects **children**.

Free-living amebic infections

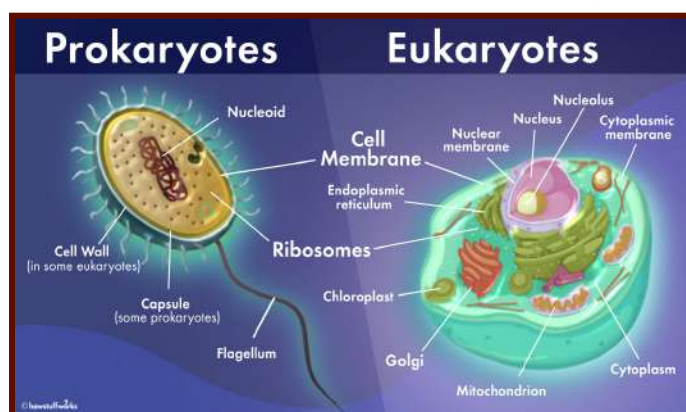
Enter through the olfactory neuroepithelium causing primary amebic meningoencephalitis (PAM) in healthy individuals

d Trophozoites in CSF and tissue
Flagellated forms in CSF



Incendiamoeba: Record Heat-Loving Eukaryote

- *Incendiamoeba cascadiensis* was found in hot springs in Lassen Volcanic National Park, USA.
- It can reproduce above **60°C**, a record for any eukaryote.
- Eukaryotes have a **membrane-bound nucleus**. Prokaryotes, such as bacteria, do not.



PFOS: A Forever Chemical That Weakens Immunity

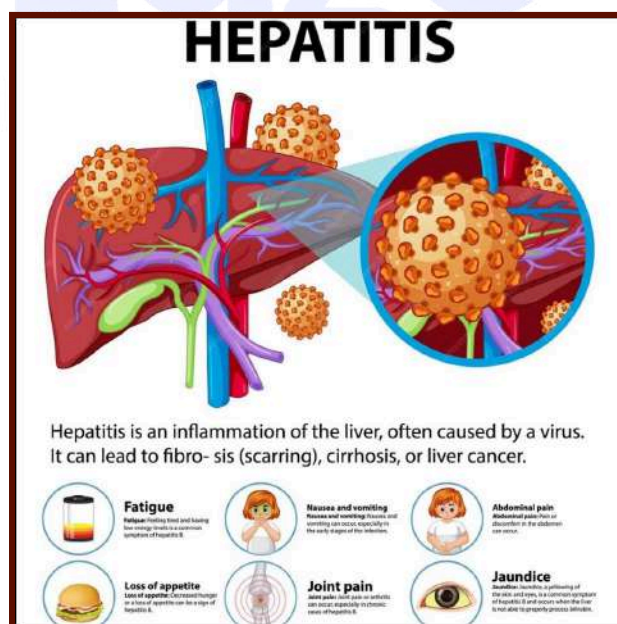
- PFOS binds to the immune protein **IRF3**, which blocks the release of **interferons**, the body's main antiviral defence.
- It is a PFAS, called a "**forever chemical**" because its strong **carbon-fluorine bonds** do not break down naturally.
- PFAS are used in **non-stick cookware**, **stain-resistant fabrics** and **firefighting foams**.

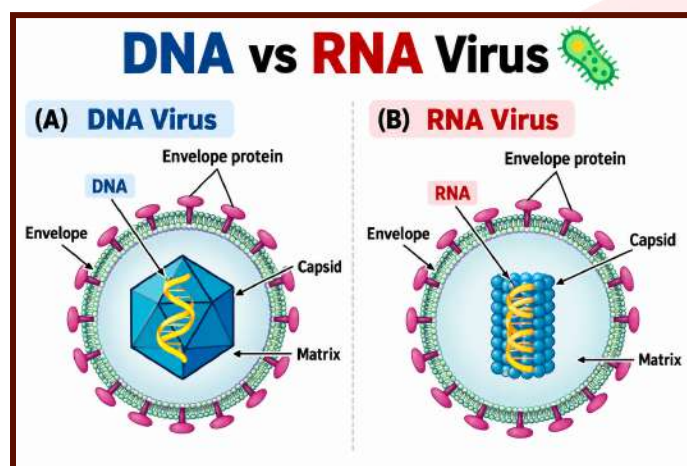
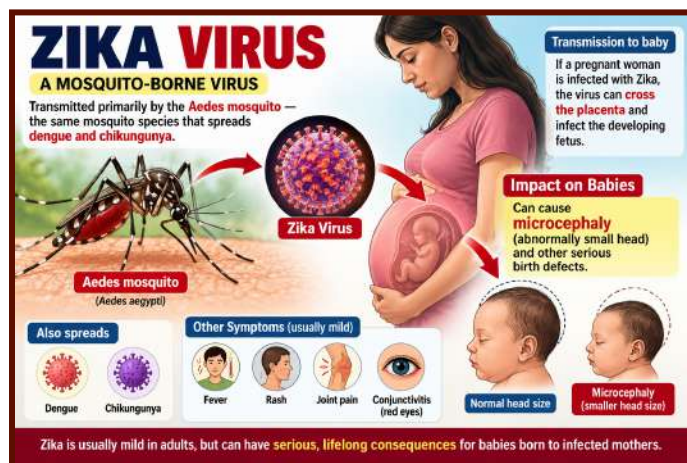
Badri Cattle: First OPU-IVF Calf

- A **Badri calf** was born through **Ovum Pick-Up and In Vitro Fertilisation (OPU-IVF)**, a milestone for conserving this **indigenous Uttarakhand breed**.
- The work involved **ICAR-NDRI, Karnal**, and **G.B. Pant University, Pantnagar**.
- A **Sahiwal** cow carried the embryo. Research on **cloning elite Badri cows** is also under way.

Low-Cost Detection of Zika and Hepatitis C

- A new **blood-drying method** detects both viruses in **whole blood** within about **two hours**.
- Both are **RNA viruses**. Enzymes in blood normally destroy RNA, which is why testing usually needs **costly purification**.
- The method needs only a **heater** and a **low-cost sensor**, so it suits **resource-poor settings**.
- **Zika** spreads through the **Aedes mosquito** and can cause **microcephaly**. **Hepatitis C** spreads through **infected blood**.





Nanomedicine: World Congress 2026

- The **World Congress on Nanomedicine 2026** was held in **New Delhi**.
- India is developing **oral insulin nanoparticles** and **nanobots for breast cancer**. A nanometre is 10^{-9} m.

Green Forge and the BioE3 Policy

- Green Forge** at **BRIC-NABI, Mohali** lets scientists test **GM crops** under simulated **light, humidity and temperature**.
- The **BioE3 Policy (2024)** promotes **biomanufacturing** and a **circular bioeconomy**.
- Bt Cotton** is India's **only commercially approved GM crop**, regulated by the **GEAC** under the **MoEFCC**.

Digital and Institutions

BHASHINI: Multilingual AI for India

- BHASHINI** is India's **AI-powered multilingual platform** under **MeitY**, launched in **2022**.
- It supports **36 Indian text languages** and **23 voice languages**, and powers over **800 government websites**.
- At **BHASHINI SANGAM** in **Kathmandu, India** and **Nepal** agreed to work on **AI for Nepali, Newari and Maithili**.
- BhashaDaan** lets citizens **donate language data**, and **Shrutilekh** offers **real-time translation**.



CSIR's Regional Science Magazines

- On CSIR's **85th Foundation Day**, five magazines were launched in **Assamese, Bengali, Marathi, Tamil and Telugu**.
- They were launched by **CSIR-NIScPR**, which works on **science communication** in regional languages.
- CSIR** was set up on **26 September 1942**, and the **PM** is its **ex-officio President**.

**PART G : INTERNAL SECURITY AND
DEFENCE****Full Articles - Mains Relevance****Strategic Deterrence: Nuclear Doctrine
Review and Space Weapons****Why in News**

- India's **nuclear doctrine**, based on **Credible Minimum Deterrence** and **No First Use (NFU)**, has stayed largely unchanged since **2003**. Shifting threats have revived the debate on **reviewing it**.
- The **US** has confirmed for the first time that it has deployed "**on-orbit space control weapons**", which raises fears of the **militarisation of space**.

About India's Nuclear Doctrine

India adopted its doctrine in **2003**, after **Pokhran-II (1998)** and **Kargil (1999)**. It treats nuclear weapons as **deterrents**, not weapons for fighting wars.

- **Credible Minimum Deterrence**: India keeps only as many weapons as it needs to deter an attack.
- **No First Use**: India will use nuclear weapons only in **retaliation**.
- **Massive retaliation**: India will respond to any nuclear strike with **unacceptable damage**.
- **Nuclear triad**: India maintains **land, air and sea** delivery systems.
- **Civilian control**: Only the **Nuclear Command Authority** can authorise use [S].
- **Exception**: India may use nuclear weapons against a major **biological or chemical attack**.

Why a Review Is Being Debated

- **Two-front challenge**: China and Pakistan now act in **closer coordination**.
- **Tactical nuclear weapons**: A massive response to a **limited strike** raises questions of **proportionality** and **credibility**.
- **Disruptive technologies**: **Cyber-attacks** and **missile defence** could weaken India's **second-strike capability**.

A **review** reassesses the doctrine's assumptions. A **revision** would change core principles such as NFU and could create **strategic uncertainty**.

About Space Weapons

Satellites are essential for **communication, banking, navigation and defence**. Many are **dual-use**, which makes it hard to separate civilian assets from military targets.

- **Earth-to-space**: **ASAT missiles**, demonstrated by the **US, Russia, China and India**.
- **Space-to-space**: satellites that disable other satellites.
- **Jamming**: ground systems that block satellite signals.

Under **Mission Shakti (March 2019)**, India destroyed one of its own satellites in **Low Earth Orbit** and became the **fourth country** with ASAT capability.

The Legal Framework for Space

- **Article IV** of the **Outer Space Treaty (1967)** bans **WMDs in orbit** but not conventional weapons.
- The **PPWT (2008)**, proposed by China and Russia, never became a treaty.
- **PAROS** talks at the **Conference on Disarmament** have produced no binding treaty.
- The **Artemis Accords** are a **non-binding** code, and **India** has signed them.

Significance

- India's doctrine has given **strategic stability** and built its image as a **responsible nuclear power**.
- **Weapons in orbit** threaten the satellites that daily life depends on.

Challenges

- Changing NFU could hurt India's **credibility** and raise **crisis risks**.
- **Cyber and AI threats** to command systems are growing.
- There is **no binding treaty** on conventional space weapons, and compliance in space is hard to **verify**.

Way Forward

- **Review** the doctrine's assumptions without **revising** its core principles.
- Strengthen **survivability, early warning** and **sea-based deterrence**.
- Support the UN **Open-Ended Working Group** on rules to prevent a **space arms race**.

Conclusion

- India's deterrence must stay **credible** amid new technologies and shifting alliances. Building **capabilities** while keeping a **restrained doctrine**, and pushing for **rules in space**, best protects India's security.

Notes - Prelims Relevance

NIA Court Issues Arrest Warrant against Hafiz Saeed

Why in News

- A special NIA court in Jammu has issued a non-bailable arrest warrant against Hafiz Muhammad Saeed, founder of the Lashkar-e-Taiba (LeT).

Key Facts

- The NIA was set up under the NIA Act, 2008, after the 26/11 attacks.
- After an MHA order, it can investigate terror cases across States without State permission.
- Its Scheduled Offences include crimes under the UAPA, the Arms Act and the Explosives Act.
- The 2019 Amendment lets it probe offences abroad that affect Indian interests, and added human trafficking and cyber-terrorism to its mandate.
- Both the Centre and the States can designate Special NIA Courts.

Vibrant Villages Programme: Turning "Last Villages" into "First Villages"

Why in News

- The Ministry of Home Affairs highlighted the progress of the Vibrant Villages Programme (VVP), which develops villages along India's international land borders.
- VVP-I and VVP-II together have an outlay of ₹11,639 crore, covering over 2,616 villages.

More on the News

- The programme treats border villages as India's "first villages" rather than its "last villages", since residents act as the eyes and ears of border forces.

- VVP-I was launched at Kibithoo, Arunachal Pradesh, in April 2023, and focuses on the northern border.
- VVP-II was launched in Assam in February 2026, and extends the programme to all land borders.
- The programme has encouraged reverse migration to villages in districts such as Kurung Kumey, Dibang Valley and Shi-Yomi in Arunachal Pradesh.

How it works:

- Each village has a Village Action Plan based on its own needs.
- Existing schemes are converged so that every household benefits.
- All-weather roads are built under PMGSY-IV.
- A High-Powered Committee headed by the Cabinet Secretary can relax guidelines for difficult border areas.



Prelims Pointers

- VVP-I was announced in the Union Budget 2022-23 and launched at Kibithoo.
- VVP-II is a Central Sector Scheme, with the MHA as nodal ministry.
- India's longest land border is with Bangladesh.
- The programme uses a Hub-and-Spoke model for livelihoods and tourism.

Mains Angle

- Populated borders strengthen security. During the 1999 Kargil intrusion, local residents were among the first to raise the alarm.

- **Reverse migration** counters the **depopulation** of strategic border areas.
- Local procurement by forces like the **ITBP** creates an **assured market** for villagers.
- Success depends on **last-mile delivery** in **difficult terrain**.

Conclusion ; The VVP turns border villages into **active partners** in national security and development.

Manipur: The New Kuki-Zo–Naga Fault Line

Why in News

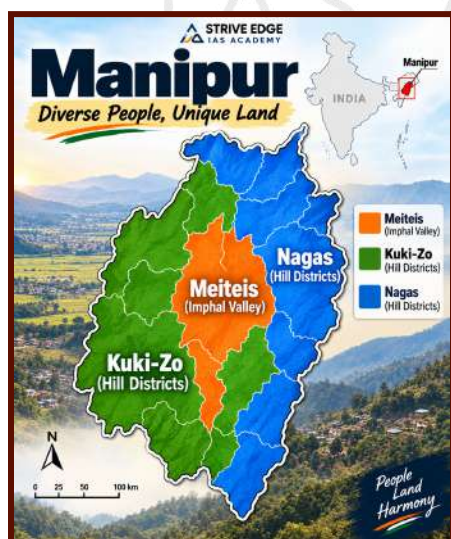
- Manipur is seeing a new **ethnic conflict** between the **Naga** and **Kuki-Zo** communities in its **hill districts**.
- This comes as the older **Meitei–Kuki-Zo** conflict, which erupted in **May 2023**, shows some **signs of easing**.

Key Facts

Manipur has three major ethnic groups:

- The **Meiteis** live mainly in the **Imphal Valley**, are mostly **Hindu**, and are **politically dominant**.
- The **Kuki-Zo** live mainly in the **hill districts**, are mostly **Christian**, and have **Scheduled Tribe** status.
- The **Nagas** also live in the **hill districts**, and have **ST** status.

The **2023 conflict** was triggered by the **Meitei demand for ST status**, disputes over **land rights** and the **hill–valley divide**. It led to **President’s Rule** for nearly a year.



Constitutional provisions:

- **Article 342** lets the President specify **Scheduled Tribes**.
- **Article 356** provides for **President’s Rule** when a State government cannot function constitutionally.
- **Article 371C** provides for a **Hill Areas Committee** in the Manipur Assembly.
- Manipur’s hill areas are **not** under the **Sixth Schedule**. They are governed through **Autonomous District Councils** under a separate State law [S].

Prelims Pointers

- **Article 371C** relates to **Manipur**.
- The **Sixth Schedule** covers **Assam, Meghalaya, Tripura and Mizoram**, but **not Manipur**.
- **Article 342** deals with the **notification of Scheduled Tribes**.
- The **hill–valley divide** is central to Manipur’s politics.

Defence Indigenisation and Diplomacy: RAKSHA, VIMARSH and the NGMV

Why in News

- Defence Minister **Rajnath Singh** released “**RAKSHA**”, India’s **10-year defence diplomacy roadmap**.
- At **VIMARSH 2026**, a DRDO–industry meet, the government launched new measures to bring **MSMEs and start-ups** into defence production.
- The **keel of the first Next Generation Missile Vessel (NGMV)** was laid at **Cochin Shipyard** on **18 September 2026**.

More on the News

- **RAKSHA** rests on **four pillars**: strategic partnerships, capacity building, indigenous exports and maritime security.
- At **VIMARSH**, **nine ToT agreements** were handed to **13 industry partners**, and a framework was launched for sharing **DRDO software source code**.
- **Six NGMVs** are being built under a **March 2023** contract worth about **₹9,805 crore**, with deliveries from **2027**.
- The **Army** plans to move **41 stations** to **Piped Natural Gas** in FY 2026–27.

Key Facts

- **RAKSHA** aims to make India a **defence manufacturing hub** and a **net security provider** in the **IOR**.
- **VIMARSH** gives MSMEs and start-ups **funding, incubation** and access to **DRDO test facilities**. It also launched **SAMAR 2.0** with the **QCI**, which rates the **manufacturing maturity** of defence firms.
- **NGMVs** are **anti-surface warfare corvettes** that will replace the **Veer-class** vessels. They are built for **maritime strike** and **sea denial** at **choke points**.
- They will carry a DRDO-developed **X-band AESA radar** and the **LM2500 gas turbine**, assembled by **HAL**.

Mains Angle

- Indigenisation reduces **import dependence** and builds **strategic autonomy**.
- Bringing in **MSMEs and start-ups** widens the **defence supply chain**.
- Sharing **source code** helps manage **obsolescence** of long-serving systems.
- **Defence exports** strengthen India's **diplomatic influence**.

Conclusion ; India is linking **defence production** with **diplomacy**, aiming to move from **importer** to **exporter**.

Maritime Security: The 1991 India–Pakistan Agreement and MAHASAGAR

Why in News

- India summoned **Pakistan's Chargé d'Affaires** after a Pakistani naval ship **collided** with an Indian Navy vessel.
- India called it a violation of **Article 10** of the **1991 Agreement** on military exercises.

More on the News

- The incident has brought India–Pakistan **Confidence-Building Measures (CBMs)** back into focus.
- Separately, Coast Guard ship **Shaunak** sailed from **Chennai to Perth** for the **QUAD-at-Sea Ship Observer Mission**.
- **Six "Sea Riders"** are on board: two each from **India and Japan**, and one each from **Australia and the US**.
- Both developments reflect India's **MAHASAGAR** vision.

Key Facts

- The **1991 Agreement on Advance Notice of Military Exercises** aims to prevent **misunderstandings** between India and Pakistan.
- **Article 10**: Naval ships and submarines of the two countries must stay at least **3 nautical miles** apart. One nautical mile is about **1.85 km**.
- Other India–Pakistan agreements include the **Indus Waters Treaty (1960)**, the **Shimla Agreement (1972)**, the **Non-Attack on Nuclear Installations Agreement (1988)** and the **Lahore Declaration (1999)**.
- **SAGAR (2015, Mauritius)** was expanded into **MAHASAGAR**, which extends India's maritime cooperation to the wider **Global South**.

Mains Angle

- **CBMs** reduce the risk of **accidental escalation** between nuclear-armed neighbours.
- Violations erode **trust** even when **dialogue** is limited.
- **Coast guard cooperation** in the Quad strengthens **maritime domain awareness**.
- **MAHASAGAR** positions India as a **net security provider** in the Indian Ocean.

Conclusion ; Strong **maritime CBMs** and **partnerships** are vital for India's security in a contested Indian Ocean.

PART H : GEOGRAPHY AND DISASTER WATCH

Full Articles - Mains Relevance

Maps, Projections and Power: Mercator vs Equal Earth

Why in News

- The **UN General Assembly** has backed a move from the traditional **Mercator map** to the **Equal Earth projection (2018)**, which shows the **true size** of countries more accurately.
- The resolution was led by **Togo** and supported by **164 countries**, including **India**. The **US** voted against it.

More on the News

- The resolution is **non-binding**, but it has revived the debate on how maps can **distort** the size of regions.
- Supporters see it as a step towards “**cognitive justice**” for **Africa**, which looks much smaller on the Mercator map than it really is.
- India objected to a UN map that showed **Arunachal Pradesh and Aksai Chin** as disputed → See Part C.
- India clarified that it supported only the **projection**, not any **boundary depiction**.

About Map Projections

The Earth is round, so turning it into a **flat map** always distorts something, whether **area, shape, distance or direction**. No map is perfect, so the best projection depends on what the map is used for.

- **Conformal**: keeps **shapes and angles** correct. It is used for **navigation** (for example, Mercator).
- **Equal-area**: keeps **sizes** correct. It is used for **thematic maps** such as population (for example, Equal Earth).
- **Equidistant**: keeps **distances** correct from a central point. It is used for **flight planning**.
- **Compromise**: balances all the distortions. It is used for **general maps** (for example, Robinson and Winkel Tripel).

The Mercator Projection

Gerardus Mercator created it in **1569**. A straight line on this map shows a **constant compass direction**, which made it ideal for **sailors**. However, it **stretches areas near the poles**:

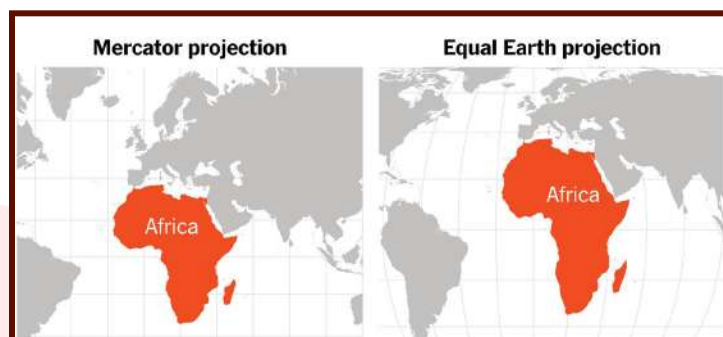
- **Greenland** looks about as big as **Africa**, though Africa is about **14 times larger**.
- **Europe and North America** look bigger, while **Africa, South America and South Asia** look smaller.
- Critics say this created a **Western-centric** view of the world, which they call “**cartographic hegemony**”.

The Equal Earth Projection

- It was developed in **2018** by an international team of cartographers. It shows the **true relative size** of landmasses and reduces **polar stretching**, though shapes are **slightly distorted**.

Earlier Alternatives

- **Gall–Peters (popularised in 1973)**: It kept sizes correct but stretched shapes.
- **Robinson (1963)**: a compromise map.
- **Winkel Tripel**: adopted by **National Geographic** in **1998**.



Significance

- It gives a **fairer picture** of the **Global South's** true size.
- It helps people see **population, climate risk and resources** more accurately.
- It fits India's role as a **voice of the Global South**.

Challenges

- The resolution is **non-binding**, so adoption is **voluntary**.
- Equal Earth also **distorts shapes**.
- **Web maps** still use Mercator-based projections for technical reasons.

Way Forward

- Choose projections by purpose: **Mercator for navigation** and **equal-area maps for education**.
- Teach **multiple projections** in schools.
- Keep up **Global South advocacy** so that symbolic support becomes real change.

Conclusion

- Maps shape how we see the world. The shift to **Equal Earth** is a step towards a **fairer picture** of the Global South.

Notes - Prelims Relevance

Gandak River and the September Flash Flood

Why in News

- **Heavy rainfall in Nepal's Gandak basin** triggered a **flash flood**, pushing the river above the **danger level**.
- **Bihar and Uttar Pradesh** were put on **high alert**.

Key Facts

The **Gandak** is a **Himalayan, snow-fed, perennial** river and a **left-bank tributary** of the **Ganga**.

- In Nepal, it is called the **Narayani**, and also the **Saptagandaki**, because of its **seven** major headstreams.
- It rises near the **Nhubine Himal glacier** in **Mustang**, Nepal, near the **Tibet** border.
- Its upper stream, the **Kali Gandaki**, flows through one of the **world's deepest gorges**, between the **Dhaulagiri** and **Annapurna** massifs.
- It enters India at **Triveni (Valmikinagar)** in **West Champaran**, where it forms part of the **India-Nepal border**.
- It flows through **UP and Bihar** and joins the **Ganga** near **Sonepur**, opposite **Patna**. Its length is about **630 km**.
- **Shaligram** stones, which are **fossilised ammonites**, are found in the **Kali Gandaki** bed.

India-Nepal links: The **Gandak Project**, based on a **1959 agreement**, built a barrage at **Valmikinagar** for **irrigation and hydropower** in Bihar, UP and Nepal. **Valmiki Tiger Reserve** lies on the Indian bank, and **Chitwan National Park** along the **Narayani** in Nepal.

Prelims Pointers

- **Left-bank** tributaries of the **Ganga** include the **Ghaghara**, **Gandak**, **Kosi** and **Mahananda**. The **Yamuna** and **Son** join from the **right bank**.
- The **Kosi** is called the **"Sorrow of Bihar"**.
- **Sonepur** is known for its famous **cattle fair** and the **Harihar Kshetra** temple.
- The **Gandak** is known as the **Narayani** in Nepal.

Mains Angle

- **Trans-border rivers** need **real-time data sharing** between India and Nepal.

- **Climate change** is making Himalayan rainfall more **intense and erratic**.
- **Embankments** alone cannot control floods in shifting, silt-heavy rivers.
- **Basin-level** flood management is needed across both countries.



Conclusion ; The Gandak flood is a reminder that **flood management** in North Bihar depends on **cooperation** with **Nepal** and **climate-ready planning**.

India-Netherlands Water Cooperation: The Kalpasar Project

Why in News

- At the **9th India International Water Week (IIWW) 2026**, India and the **Netherlands** signed **two MoUs** to support the **Kalpasar Project** in **Gujarat**.
- The MoUs involve the **Central Water Commission**, Gujarat's **Kalpasar Department**, the Dutch institute **Deltares** and **TU Delft**.



Key Facts

- The **Kalpasar Project** aims to create a large **freshwater reservoir** in **Gujarat**.
- It will collect runoff from the **Sabarmati, Mahi and Dhadhar** rivers, topped up with **Narmada** water.
- It involves building a **dam across the Gulf of Khambhat**.
- It draws lessons from the Dutch **Afsluitdijk**, a major **sea-closure dam** and coastal defence work.
- The **Netherlands** is a global leader in **water management**, because much of its land lies **below sea level**.
- **IWW** is organised by the **Ministry of Jal Shakti**.
- **IWW** called for **participatory water governance, reuse of treated wastewater** and **river-basin approaches** to climate adaptation.

Mains Angle

- International expertise can help India build **complex coastal water infrastructure**.
- Kalpasar could provide a major new **freshwater** source for **water-stressed Gujarat**.
- **Ecological impacts** on the **Gulf of Khambhat** and fisheries need careful study.
- **River-basin** planning is key to **climate-resilient** water management.

Conclusion ; The Kalpasar MoUs show how **global partnerships** can support India's most ambitious **water-security** projects.

PART I: HISTORY, ART AND CULTURE

Full Articles - Mains Relevance

Poompuhar Underwater Excavation: Evidence of Ancient Maritime Trade

Why in News

- The **Tamil Nadu Archaeology Department** and the **Indian Maritime University** carried out an **18-day underwater exploration** near **Poompuhar**, an ancient **Chola port**.
- The finds point to Poompuhar's ancient **trade links** with **West Asia** and the **Mediterranean**.

About Poompuhar

Poompuhar, also known as **Puhar** and **Kaveripattinam**, lies at the mouth of the **Kaveri** river, where it meets the **Bay of Bengal**. In Sangam Tamil, "**Puhar**" means a **river-mouth** or **harbour town**. It is believed to have been the **capital and chief port** of the **early Cholas**.

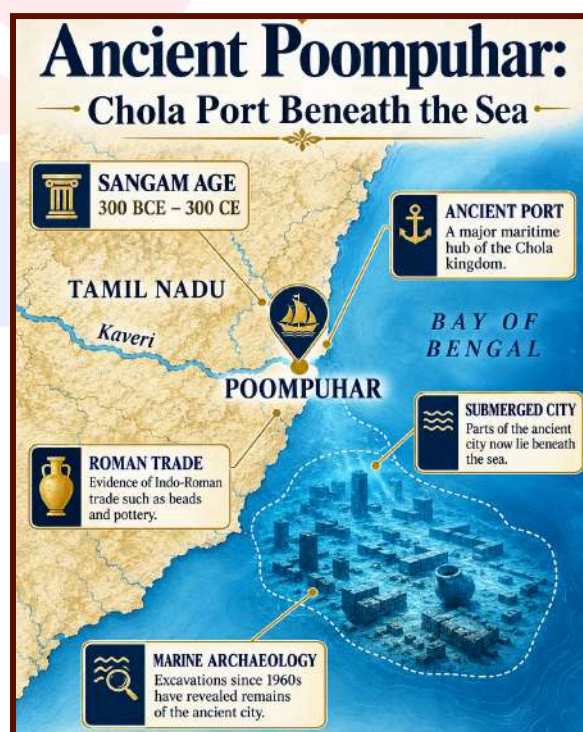
Merchants from across **India and South-East Asia** traded here. Imports included goods from the **Ganga region**, food from **Sri Lanka** and spices from **Java**.

The city was divided into three parts:

- **Maruvurpakkam**, along the **seashore**
- **Pattinappakkam**, to the **west**
- **Nalangadi**, a **market area** **between** the two

Poompuhar is described in **Sangam and post-Sangam** literature, mainly in:

- **Silappadikaram**, a Tamil epic by **Ilango Adigal**, set partly in Poompuhar
- **Manimekalai**, its sequel
- **Pattinappalai**, a poem from the **Pattupattu** collection that describes the port



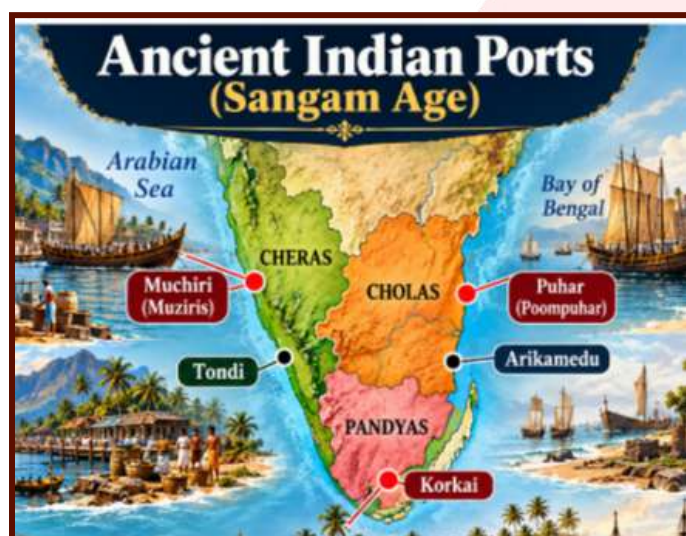
About the Sangam Age and Its Ports

The **Sangam age** dates roughly from **300 BCE to 300 CE**. It was the era of the three Tamil kingdoms: the **Cheras**, **Cholas** and **Pandyas**.

The great Sangam ports:

- **Puhar (Poompuhar)** was the port of the **Cholas**, at the **Kaveri** mouth.
- **Muziris (Muchiri)** was the port of the **Cheras**, on the **Malabar Coast** in Kerala.
- **Korkai** was the port of the **Pandys**, at the mouth of the **Thamirabarani**, and was famous for **pearls**.
- Other ports included **Tondi** and **Arikamedu**, near Puducherry, an **Indo-Roman trading post** called **Poduke** in Greek sources.

The *Periplus of the Erythraean Sea*, a 1st-century CE Greek sailors' guide, describes this **Indian Ocean trade**. **Indo-Roman** trade brought **gold and wine** into South India, and took out **pepper, pearls, ivory and textiles**.



Significance

- The finds confirm Poompuhar's place in an **ancient global trade network**.
- They show how **archaeology** can verify accounts in **Sangam literature**.
- They highlight India's **maritime heritage**, a theme also promoted at **Lothal**.
- They open new avenues for **underwater archaeology** in India.

Conclusion

- The Poompuhar finds bring **literature and archaeology** together, confirming South India's role as a hub of **ancient Indian Ocean trade**.

Indian Crafts, GI Tags and Cultural Misappropriation

Why in News

- Global luxury brands **Ralph Lauren** and **Fendi** have been criticised for products that resemble Indian crafts such as **aari embroidery** and **mirror work**.
- This follows the earlier controversy over **Prada's Kolhapuri-style sandals**.

More on the News

- Experts say India's **traditional crafts** lack strong **legal protection** against copying by global brands.
- In **June 2025**, **Prada** showed sandals closely resembling **Kolhapuri chappals**. It called them just "leather sandals" and priced them very high.
- The **Bombay High Court** dismissed a **PIL** on **16 July 2025**, holding that only **registered GI holders** can bring such a case.
- Experts recommend **community ownership** of crafts, **digital registries** and **stronger legal protection**.

Why Traditional Crafts Are Hard to Protect

- **Copyright** fails because traditional crafts often have **no single creator** and may be **centuries old**.
- **Design law** protects only **new designs**, so old traditional designs may not qualify.
- **Patents** protect **inventions**, not **traditional art** or craft techniques.
- **Trademarks** protect **names and logos**, not **techniques**.
- A **Geographical Indication** protects a product's **name, origin and reputation**, but not every **design or technique**.
- Brands can use an **"inspired by"** loophole, copying a style without crediting its **origin**.
- Artisan communities often lack the **money and legal support** to fight large companies.

About Geographical Indications (GI)

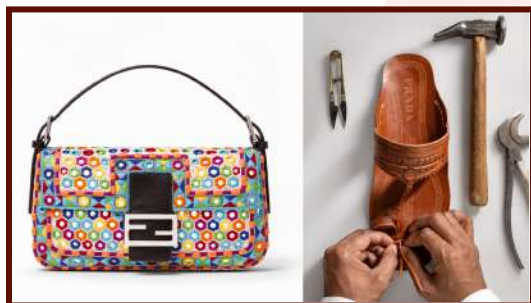
A **Geographical Indication** identifies goods that come from a **specific place**, and whose qualities or reputation are linked to that place.

- India protects GIs through the **Geographical Indications of Goods (Registration and Protection) Act, 1999**, which came into force on **15 September 2003**. It was passed to meet India's **TRIPS** commitments under the **WTO**.

- The **GI Registry** is in **Chennai**, under the **Controller General of Patents, Designs and Trade Marks**, in the **Commerce Ministry**.
- **Darjeeling Tea** was India's **first GI**, in **2004**. A GI registration is valid for **10 years** and can be **renewed**.
- A GI is the **public property** of its producers. It **cannot be transferred, assigned or licensed**.
- **Registered proprietors** and **authorised users** can sue for **infringement**.
- India has over **600** registered GIs.

The Kolhapuri Chappal Case

Kolhapuri chappals are handmade leather sandals from **Maharashtra and Karnataka**, and carry a **GI tag**. The registered GI holders are two State bodies. The case shows that a right may exist, but **who can enforce it, and how**, remains a practical challenge.



Significance

- Crafts are a vital source of **livelihood** for millions of artisans, many of them **women and rural workers**.
- They form part of India's **intangible cultural heritage** and **soft power**.
- Fair credit and **benefit-sharing** can raise artisans' incomes in global markets.
- The issue links **culture, trade and IPR** law.

Challenges

- **Legal gaps** leave traditional designs and techniques **unprotected**.
- Only **registered GI holders** can sue, which leaves **individual artisans** without remedy.
- **Global enforcement** across countries is weak.
- **Documentation** of many crafts is incomplete.

Way Forward

- Create **digital registries** of traditional designs, similar to the **Traditional Knowledge Digital Library**.

- Allow **artisan collectives** to act against **infringement**.
- Push for stronger **international protection** of traditional cultural expressions at **WIPO**.
- Help artisans build **brands** and reach **global markets** directly.
- Encourage **ethical collaborations** in which brands **credit and pay** artisan communities.

Conclusion

- Protecting India's crafts needs more than **GI tags**. It requires **community rights, documentation** and **global advocacy** to ensure that artisans, not just brands, benefit from their heritage.

Tulu Gets Additional Official Language Status in Karnataka

Why in News

- The **Karnataka Cabinet** has decided to make **Tulu** an **additional administrative language** in the **Dakshina Kannada and Udupi** districts.
- The move requires an **amendment** to the **Karnataka Official Language Act, 1963**, and the **Governor's approval**.

About Tulu

Tulu is a **Dravidian** language spoken mainly in **Dakshina Kannada, Udupi** and northern **Kasaragod** (Kerala). This region is known as **Tulu Nadu**.

- About **18.5 lakh** people reported Tulu as their **mother tongue** in the **2011 Census**.
- **UNESCO** classifies Tulu as **"Vulnerable"**.
- It was traditionally written in the **Tigalari** script, but is now commonly written in the **Kannada** script.
- It has been taught as an optional **third language** in **Classes 6–10** in the two districts since **2010–11**.



Constitutional Provisions on Language (Part XVII)

- **Article 343** makes **Hindi in Devanagari** the official language of the **Union**.
- **Article 345** lets a **State Legislature** adopt one or more languages for **official use**. The Tulu decision rests on this Article.
- **Article 347** lets the **President** recognise a language spoken by a **substantial proportion** of a State's people.
- **Article 350A** provides for **mother-tongue instruction** at the **primary stage** for linguistic minorities, and **Article 350B** provides for a **Special Officer** for them.
- **Article 351** makes it the Union's duty to promote **Hindi**.
- The Constitution names **no national language**.

About the Eighth Schedule

The **Eighth Schedule** lists **22 languages**, and only **Parliament** can add a language, through a **constitutional amendment**.

- The **original** list had **14 languages**.
- **Sindhi** was added by the **21st Amendment (1967)**.
- **Konkani, Manipuri and Nepali** were added by the **71st Amendment (1992)**.
- **Bodo, Dogri, Maithili and Santhali** were added by the **92nd Amendment (2003)**.
- The **96th Amendment (2011)** changed "**Oriya**" to "**Odia**".

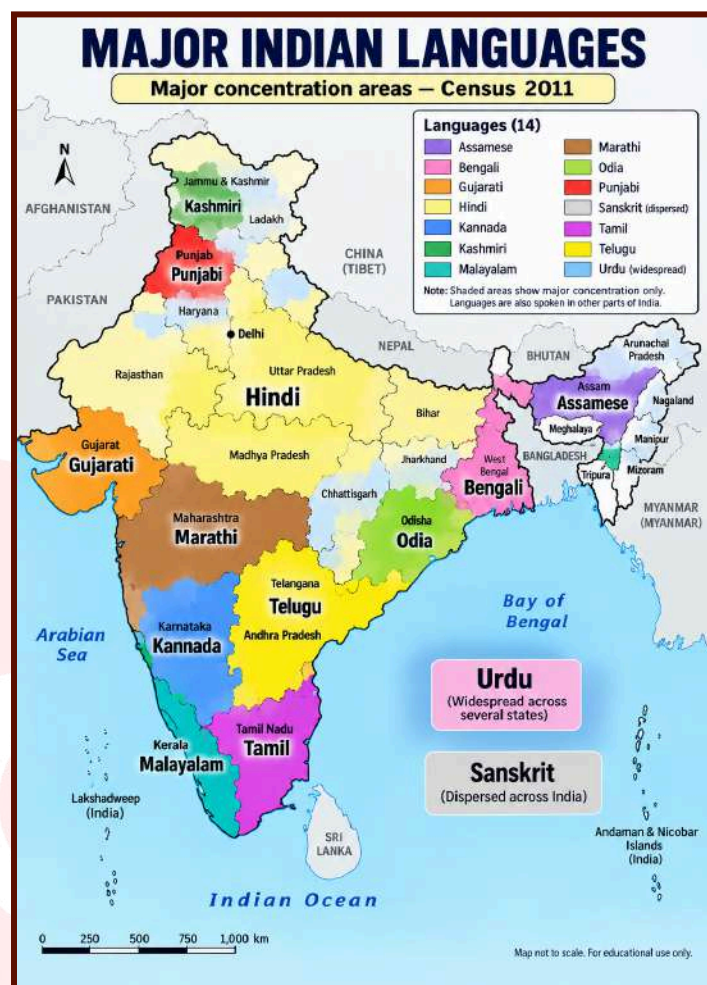
No **fixed criteria** exist for inclusion, although the **Pahwa (1996)** and **Sitakant Mohapatra (2003)** committees examined the issue. Languages like **Tulu, Bhojpuri and Kokborok** are still awaiting inclusion.

About Classical Languages

India began designating **classical languages** in **2004**. Six languages had this status before 2024:

- **Tamil (2004)**
- **Sanskrit (2005)**
- **Kannada and Telugu (2008)**
- **Malayalam (2013)**
- **Odia (2014)** [OD]

In **October 2024**, **Marathi, Pali, Prakrit, Assamese and Bengali** were added, taking the total to **11**. The criteria include **high antiquity**, a body of **ancient literature** and an **original literary tradition**. **Pali and Prakrit** are **not** in the Eighth Schedule.



Significance

- The decision strengthens the **identity and survival** of a **vulnerable language**.
- It improves **access to governance** for people in their **own language**.
- It reflects **linguistic federalism** under **Article 345**.
- It may support Tulu's demand for **Eighth Schedule** inclusion.

Challenges

- It needs a **legal amendment** and the **Governor's approval** before it takes effect.
- Administrative use requires **trained staff** and **translated documents**.
- It may prompt **similar demands** from other language groups.

Way Forward

- Amend the **1963 Act** and frame clear **implementation rules**.

- Train officials and develop **digital tools** for Tulu.
- Promote Tulu **literature, media** and **education**.
- Set **transparent criteria** for **Eighth Schedule** inclusion.

Conclusion

- Recognising Tulu shows how **linguistic federalism** can protect India's **language diversity**. Its success depends on **effective implementation** and continued **cultural support**.

Notes - Prelims Relevance

National Maritime Heritage Complex at Lothal

Why in News

- Union Minister **Sarbananda Sonowal** chaired the **Governing Council** meeting to review progress of the **National Maritime Heritage Complex (NMHC)** at **Lothal, Gujarat**.
- **Phase 1A** is over **82% complete**, and **13 countries** have signed MoUs to collaborate on the project.

Key Facts

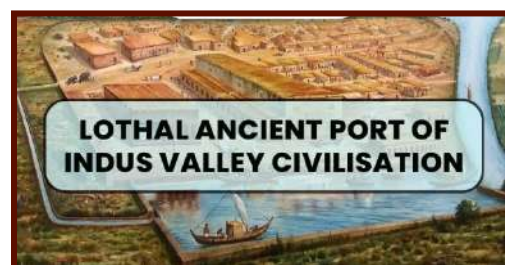
About Lothal

- Lothal is a **Harappan (Indus Valley Civilisation)** site in Gujarat. It lies in **Ahmedabad district**, near the **Bhogavo** river and the **Gulf of Khambhat**.
- It is famous for one of the **world's earliest known dockyards**, which shows that the Harappans had advanced **maritime trade** capabilities.
- It was excavated by the **ASI** under **S.R. Rao** between **1955 and 1960**.
- Other finds include a **bead-making factory**, **fire altars** and **Persian Gulf-type seals**, which point to trade with **Mesopotamia** and West Asia.
- Lothal is on UNESCO's **Tentative List** of World Heritage Sites.

About the NMHC

- It is being developed by the **Ministry of Ports, Shipping and Waterways**.
- It aims to make Lothal a global centre of **maritime heritage, education and tourism**.

- It is planned as one of the **world's largest maritime museums**, with themed galleries, a **lighthouse museum** and a recreation of the **Harappan town**.



Mains Angle

- The project links **archaeology, tourism, culture and diplomacy** in one model.
- It uses heritage as a **soft-power** tool, supported by multi-country MoUs.
- It complements maritime initiatives such as **Sagarmala** and the **MAHASAGAR** vision.
- Excavation must be balanced with the **conservation** of the original site.

Conclusion ; The NMHC turns Lothal's ancient dockyard into a symbol of India's **5,000-year maritime identity**.

Battle of Haifa: India's Forgotten Cavalry Triumph



Why in News

- The Indian Army observed **Haifa Day** on **23 September**, marking the anniversary of the **Battle of Haifa (1918)**.
- The battle remains an important symbol of **India-Israel** historical ties.

More on the News

- The battle was fought on **23 September 1918**, during the **Sinai and Palestine Campaign** of **World War I**.
- It was fought between the **Allied Powers** and the **Ottoman Empire**.

- Indian cavalry charged positions defended by **machine guns, rifles and artillery**, using only **swords and lances**.
- It is remembered as one of the most notable **cavalry charges** of the war.

Key Facts

- Haifa was captured by the **15th Imperial Service Cavalry Brigade**, which comprised the **Jodhpur, Mysore and Hyderabad Lancers**.
- Major Dalpat Singh** of the **Jodhpur Lancers**, known as the “**Hero of Haifa**”, was killed in the battle and posthumously awarded the **Military Cross**.
- The Indian Army’s **61st Cavalry** commemorates Haifa Day.

Conclusion ; The Battle of Haifa honours Indian valour abroad and adds a **historical bond** to India–Israel ties.

The Baltic Way and Gandhian Influence

Why in News

- 23 August 2026 marked the **37th anniversary** of the **Baltic Way (1989)**, a historic **human chain**.
- The protest drew on **Gandhian non-violence**, which highlights a lasting **India–Baltic bond**.

More on the News

- About **2 million people** formed a **675-km chain** across **Lithuania, Latvia and Estonia**.
- They demanded freedom from **Soviet rule**.
- Baltic leaders studied India’s freedom struggle and adopted **Ahimsa** and **Satyagraha**.
- Attenborough’s film “Gandhi” (1982)** was aired on **Lithuanian national TV** to educate citizens.

Key Facts

The Baltic Way (1989)

- It marked 50 years of the **Molotov–Ribbentrop Pact (1939)**, which led to the **Soviet annexation** of the Baltic states.
- It echoed Gandhi’s **Non-Cooperation** and **Civil Disobedience** methods.
- It was part of the “**Singing Revolution**”. The three states **regained independence in 1990–91**.
- Its documents are on **UNESCO’s Memory of the World Register**.



India–Baltic Ties

- Relations since **1992** cover **technology, sustainability, the blue economy and culture**.
- Bilateral trade in 2025–26** was **\$490.61 mn** with Lithuania, **\$475.66 mn** with Latvia and **\$219.69 mn** with Estonia.
- Hermann Kallenbach**, Gandhi’s close friend, was **Lithuanian-born**. A **Gandhi–Kallenbach monument** stands in **Rusnė (2015)**.
- India gifted a **Gandhi bust to Latvia (2019)** and a **statue to Estonia (2025)**.

Conclusion ; The Baltic Way shows that **Gandhi’s methods** remained a **living force for freedom** long after India’s independence.

The Cardiff Agreement and the Structure of the UK

Why in News

- The **First Ministers of Scotland, Wales and Northern Ireland** signed a joint MoU, the “**Cardiff Agreement**”, in **Cardiff**.
- It signals their intent to move towards **independence referendums** from the UK.

More on the News

- It was signed in their capacity as **party leaders**, so it is a **political statement**, not a binding document.
- It asserts the **right to self-determination** and asks **Westminster** to prepare for constitutional change.
- **UK PM Andy Burnham** ruled out referendums, while **US President Donald Trump** backed **Irish reunification**.
- Polls show support for independence at **47% in Scotland**, **36% in Northern Ireland** and **32% in Wales**.

Key Facts

Structure of the UK

- The UK has **four nations: England, Scotland, Wales and Northern Ireland**.
- **Great Britain** = England, Scotland and Wales. The **island of Ireland** = Republic of Ireland and Northern Ireland.

Formation of the UK

- **1536:** Wales was incorporated into England.
- **1707:** England and Scotland formed the **Kingdom of Great Britain**.
- **1801:** Ireland joined after the **Acts of Union (1800)**.
- **1922:** Most of Ireland became independent; **six counties** of Northern Ireland stayed in the UK.



Independence Movements

- **Scotland:** In the **2014 referendum**, **55.3% voted No**. In **2022**, the **UK Supreme Court** ruled that another referendum needs **Westminster's approval**.
- **Northern Ireland:** The **Good Friday Agreement (1998)** [S] set up **power-sharing** and allows a future **border poll**.
- **Devolution (1998–99)** [S] created the **Scottish Parliament**, **Welsh Senedd** and **Northern Ireland Assembly**.

Sowa Rigpa: The Himalayan System of Medicine

Why in News

- The **Ministry of Ayush** called for stronger **education, research, documentation and standardisation** of **Sowa Rigpa** at a workshop by the **National Institute of Sowa Rigpa, Leh**.

Key Facts

About Sowa Rigpa

- **Sowa Rigpa** means the “**science of healing**”, and is often called **Tibetan medicine**.
- It is practised in the **Himalayan and trans-Himalayan** regions, including **Ladakh, Sikkim, Arunachal Pradesh** and **HP**.
- It draws on ancient **Indian, Tibetan and Chinese** medical traditions.
- Its foundational text is the **rGyud-bzhi (Four Tantras)**, and its practitioners are called **Amchis**.
- It is officially recognised under the **Ministry of Ayush**. It is the “**S**” in **AYUSH**, alongside **Ayurveda, Yoga, Unani, Siddha and Homoeopathy**.

Mains Angle

- Sowa Rigpa is part of India's **living traditional knowledge** in border regions.
- **Standardisation and evidence-based research** are needed for wider acceptance.
- It supports **healthcare access** in remote Himalayan areas.
- It can strengthen India's **soft power**, including through **BRICS** cooperation on traditional medicine.

Conclusion ; Standardising Sowa Rigpa can protect a **Himalayan heritage** while making it **safe and globally credible**.

Silk in India: Central Silk Board's 77th Foundation Day

Why in News

- The **Central Silk Board (CSB)** celebrated its **77th Foundation Day** in **Bengaluru**.
- It aims to make India the **world's No. 1 silk producer by 2028–29** and reach **60,000 MT by 2030–31**.

More on the News

- The target aligns with **Mission Sanehejori**, which promotes **Muga silk** as a **global luxury brand**.
- India is the **second-largest producer** (after **China**) and the **largest consumer** of silk.
- Raw silk imports** fell from **2,650 MT (2023–24)** to **2,036 MT (2024–25)** due to the push for **bivoltine silk**.
- The sector employs about **80.90 lakh people**, mostly **rural** and largely **women**.

Key Facts

Five Commercial Silks (India produces all five)

- Mulberry:** About **70–75%** of raw silk; from **Bombyx mori**, which feeds only on **mulberry leaves**.
- Tasar:** Coarse, **copper-toned wild (vanya) silk** from **Antheraea mylitta**, reared on **Asan and Arjun** trees. **Oak Tasar** is a related variety.
- Eri:** From **Philosamia ricini**, which feeds on **castor**. It is **spun, not reeled**, as the moth breaks out of the cocoon.
- Muga:** India's only **golden silk, exclusive to Assam [AS]**; from **Antheraea assamensis**, fed on **Som and Soalu** leaves.



GI-tagged Silks

- Muga (Assam), Kancheepuram, Mysore Silk, Chanderi (MP), Baluchari (WB) and Orissa Ikat [OD]**.

Conclusion ; India's silk strategy links **rural livelihoods, heritage crafts and import substitution**.

MoTA–IGNCA MoU on Tribal Cultural Heritage

Why in News

- The **Ministry of Tribal Affairs (MoTA)** and the **Indira Gandhi National Centre for the Arts (IGNCA)** signed an MoU on **28 September 2026**.
- The MoU aims to **preserve and digitise** India's **tribal cultural heritage**.

Key Facts

- The MoU focuses on identifying and protecting **endangered tribal languages and oral traditions**.
- IGNCA** was set up in **1987** in memory of **Indira Gandhi**. It is an **autonomous trust** under the **Ministry of Culture**, headquartered in **New Delhi**.
- MoTA** was created in **1999**, carved out of the **Ministry of Social Justice and Empowerment**.

Constitutional linkages

- Article 342** lets the **President** specify **Scheduled Tribes**, and **Article 366(25)** defines them.
- The **Fifth Schedule** covers **Scheduled Areas** in most States, while the **Sixth Schedule** covers tribal areas in **Assam, Meghalaya, Tripura and Mizoram**.
- Article 29** protects the distinct **language, script or culture** of any section of citizens.
- Article 51A(f)** makes it a **Fundamental Duty** to value and preserve our **composite culture**.
- India has **75 PVTGs** (Particularly Vulnerable Tribal Groups), identified for special protection.

Mains Angle

- Many tribal **oral traditions** are disappearing as elders pass away and languages decline.
- Digital archives** can preserve knowledge that has never been **written down**.

- Documentation must respect **community consent** and **ownership** of knowledge.
- Cultural preservation supports **tribal identity** and **self-esteem**, alongside economic welfare.

Conclusion ; The MoU treats tribal heritage as **national heritage** that deserves systematic **protection and pride**.

Bharatanatyam and the Legacy of Indu Mitha

Why in News

- Bharatanatyam exponent **Indu Mitha** passed away in **Dublin** on **31 August**, at the age of **97**.
- After **Partition**, she spent nearly **70 years** promoting Bharatanatyam in **Pakistan**.

About Bharatanatyam

- It is regarded as the **oldest surviving** classical dance form of India, and originated in **Tamil Nadu** in **temple traditions**.
- It was earlier called “**Sadir**” and was performed by **Devadasis**.
- Its theory draws on **Bharata Muni’s Natyashastra** and **Nandikeshwara’s Abhinaya Darpana**.
- Its signature posture is **Araimandi**, a half-seated stance, and it is performed to **Carnatic music**.
- Its performance sequence is called the **Margam**, from **Alarippu** and **Jatiswaram** to **Varnam** and **Tillana**.



Revival

- It faced stigma under British rule because of the **Anti-Nautch Movement**.
- **E. Krishna Iyer** and **Rukmini Devi Arundale** led its revival.
- Rukmini Devi founded **Kalakshetra** at **Adyar, Chennai**, in **1936**, which follows the **Pandanallur** style of **Meenakshi Sundaram Pillai**.
- **Balasaraswati** represented the traditional **Devadasi** lineage.

The eight classical dances recognised by the **Sangeet Natak Akademi** are **Bharatanatyam, Kathak, Kathakali, Odissi, Kuchipudi, Manipuri, Mohiniyattam** and **Sattriya**.

Gondhal: The Folk Ritual behind India’s Oscar 2027 Entry

Why in News

- The Marathi film “**Gondhal**”, directed by **Santosh Davakhar**, is India’s **official entry** for the **Oscars 2027**.
- It will compete in the **Best International Feature Film** category.

More on the News

- The **Film Federation of India (FFI)** chose it from **33 films** across languages; **Angh** and **Ikkis** were the runners-up.
- The film is a **thriller** set in **rural Maharashtra**, and unfolds over **one night** during a **Gondhal ritual**.
- It follows **Suman**, a woman in an **oppressive marriage** who plans an escape.
- It won the **Silver Peacock** for **Best Director** at the **56th IFFI, Goa (2025)**.

Key Facts

What is Gondhal?

- **Gondhal** is a **folk ritual-performance** tradition of **Maharashtra**.
- It is devoted to the goddess **Durga Bhavani** and the god **Khandoba**.
- It is performed by the **Gondhali** community, often at **weddings**, with **all-night singing and dancing** to bless the couple.
- It belongs to the same family of Maharashtra folk arts as **Tamasha, Lavani** and **Dashavatar**.



India's Oscar history

- The **FILM**, a **private apex body** of producers, distributors and exhibitors based in **Mumbai**, has selected India's entry since **1957**. It is **not** a government agency.
- India's **first** entry was **Mother India (1957)**, directed by **Mehboob Khan**.
- Only **three** Indian films have been **nominated**: **Mother India**, **Salaam Bombay! (1988)** by **Mira Nair**, and **Lagaan (2001)** by **Ashutosh Gowariker**.
- **No Indian film** has won in this category.
- The category was called **Best Foreign Language Film** until it was renamed in **2020**.

Mains Angle

- The film brings a **regional folk ritual** to a **global audience**.
- Its story uses a **traditional setting** to explore **women's agency**.
- Regional cinema increasingly represents India's **cultural diversity** abroad.
- Folk arts need **patronage and documentation** to survive modern change.

Conclusion ; Gondhal shows how **regional folk traditions** can power India's **global cinematic voice**.

PART J : SOCIETY, LABOUR AND HEALTH

Full Articles - Mains Relevance

Demographic Dividend and Skilled Talent Mobility: From Brain Drain to Brain Circulation

Why in News

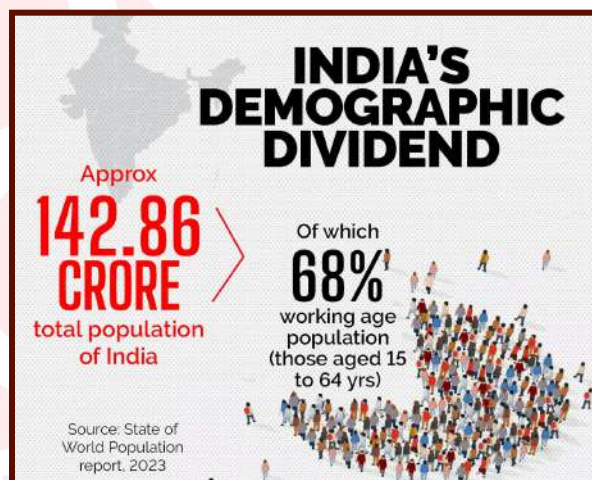
- As developed countries face **ageing populations** and **labour shortages**, India's **young workforce** is gaining global importance.

- India has about **450 million people aged 18–35**, and **worker remittances** reached **\$110.47 billion** in **FY 2025–26**.

About the Demographic Dividend

The **demographic dividend** is the growth possible when the **working-age population** outnumbers **dependents**. India's biggest asset is its **young, English-speaking and digitally literate** population. However, this **demographic window is temporary**.

A young population alone does not create a dividend. Workers also need **language skills, technical certification, cultural preparedness** and **professional discipline**.



From Brain Drain to Brain Circulation

- **Brain drain** was the fear that talented Indians would leave **permanently**.
- **Brain circulation** is a **two-way model**, where workers gain experience abroad, send back **remittances and knowledge**, and often return or stay connected.
- **Circular mobility** means **temporary, structured migration**, as in **Singapore's work-permit system** and **Gulf frameworks**. Its **temporariness** makes it politically acceptable to host countries.

Significance

- Remittances are among India's **most stable sources of foreign exchange**.
 - Remittances grew about **26%** over the previous year and often **exceed FDI inflows**.
- Overseas jobs ease **unemployment and underemployment** at home.

- A skilled diaspora boosts India's **soft power** and positions it as a **strategic partner**, not just a labour supplier.

Challenges

- **Skill mismatch** between domestic training and global needs.
- **Anti-migration sentiment** in destination countries.
- **Exploitation** of low-skilled migrants and **unregulated recruitment** by informal agents.
- **Non-recognition** of Indian qualifications abroad.

Way Forward

- Build **globally aligned skill certification**, especially in **healthcare and construction**.
- Expand **bilateral labour mobility agreements** and strictly **regulate recruitment agencies**.
- Promote **mutual recognition of qualifications** and **language training**.
- Treat skills as part of **economic diplomacy**.

Conclusion

- India's **demographic moment** is rare but temporary. Strong **skilling institutions** and **ethical mobility frameworks** can turn young Indians into a source of **national prosperity** and **global influence**.

Women in India: Gender Gap Index, Informal Work and the Contraception Gap

Why in News

- India **retained** its **131st rank** in the **World Economic Forum's Global Gender Gap Index 2026**.
- **MoSPI** released **district-level** data on women in the **informal workforce** for the first time.
- **NFHS-6 (2023–24)** shows a wide **gender gap** in sterilisation: **36.5%** of married women against just **0.5%** of men.

More on the News

- India's gender parity score is **64.5%**, a **slight improvement**, but still below the **global average**.
- **Nirmal (Telangana)** has the **highest** share of women among informal workers (**78%**), while **Rudraprayag (Uttarakhand)** has the **lowest** (**7%**).

- **Contraceptive use** among married women rose from **66.7% (NFHS-5)** to **69.1% (NFHS-6)**, but **modern method** use fell.
- The **WHO** has issued new contraception guidelines, including benchmarks for **reversible male contraceptives** for the first time.

About the Global Gender Gap Index

The index is released annually by the **World Economic Forum (WEF)**, headquartered in **Geneva**. It measures **relative gaps** between men and women, not the **absolute** level of development. It is based on **four sub-indices**:

- **Economic Participation and Opportunity**
- **Educational Attainment**
- **Health and Survival**
- **Political Empowerment**

Key rankings (2026)

- **Iceland, Finland and Norway** topped the index.
- **Chad, Iran and Pakistan** were the bottom three, with **Chad** last.
- India's rank stayed the same even as its score improved, because **other countries improved too**.

About Women in the Informal Workforce

The data comes from **ASUSE 2025** (the **Annual Survey of Unincorporated Sector Enterprises**), run by the **NSO** under **MoSPI** since **2021–22**. For the first time, it gives estimates for **757 districts**. ASUSE covers unincorporated **manufacturing, trade and services** enterprises, but **excludes agriculture and construction**.

Highest share of women	%	Lowest share of women	%
Nirmal (Telangana)	78	Rudraprayag (Uttarakhand)	7
Imphal East (Manipur)	70	Banaskantha (Gujarat)	9
Nizamabad (Telangana)	70	Palamu (Jharkhand)	11
Jagtial (Telangana)	69	Hathras (Uttar Pradesh)	11

Telangana and Manipur dominate the top districts, which shows that women's informal work is **highly concentrated** by region.

The Contraception Gap (NFHS-6)

- Use of **modern methods** fell from **56.4% to 52.7%**, while **traditional methods (rhythm and withdrawal)** rose by about **6 percentage points**, the biggest rise of any method.
- **Female sterilisation** dipped from **37.9% to 36.5%**, but has stayed at about **36–38%** since NFHS-3.
- **Male sterilisation** rose only from **0.3% to 0.5%**, far below **3.4% in NFHS-1**. Only **Telangana** saw a rise of over **one percentage point**.
- **Unmet need for family planning** fell by **one percentage point**.
- India's **fertility rate** is now **below replacement level**, yet **contraception remains largely a woman's burden**.

Provisions and Institutions

- The NFHS is run by the **Ministry of Health and Family Welfare**, with the **IIPS, Mumbai**, as nodal agency.
- The **replacement level TFR** is **2.1**.
- **Mission Parivar Vikas** improves access to contraception in **high-fertility** districts.
- **No-Scalpel Vasectomy (NSV)** is a minimally invasive male sterilisation method promoted in public health services.
- **Article 15(3)** allows **special provisions for women**, and **Article 39(d)** calls for **equal pay for equal work [S]**.

Significance

- Gender gaps hold back **growth**, as women's **workforce participation** remains low.
- **District-level data** allows **targeted** policy for women workers.
- The contraception gap shows how **gender norms** shape health outcomes.
- Gender equality is central to **SDG 5** and the **Viksit Bharat** goal.

Challenges

- **Economic participation** and **political empowerment** remain India's weakest areas.
- Most informal women workers lack **social security, fair wages** and **safe conditions**.
- **Male sterilisation** faces **myths** about masculinity and loss of strength.
- The fall in **modern methods** may raise **unintended pregnancies**.

Way Forward

- Raise women's **workforce participation** through **childcare, safe transport** and **flexible work**.
- Extend **social security** to informal women workers through **e-Shram** → See Tier B note.
- Promote **male participation** in family planning, including **NSV**.
- Expand the **basket of modern contraceptives** and counselling.
- Use **district-level data** for targeted **skilling and credit** schemes.

Conclusion

- India's gender gap is visible in the **labour market, politics and family**. Closing it needs **data-driven policy, social security** and a shift in **social norms**.

Notes - Prelims Relevance

Census 2027 and Caste Enumeration

Why in News

- In his **Mann Ki Baat** address, the Prime Minister called **Census 2027** a **national responsibility**.
- The **first phase** is nearly complete, covering **32+ crore families**, and **2.6 crore** people have used **digital self-enumeration**.

More on the News

- Census 2027 will be the **16th Census** of India and the **8th** after Independence.
- It was originally due in **2021**, but was **postponed** because of **COVID-19**.
- It is the **first fully digital** Census, with an option of **self-enumeration**.
- It will include a **full caste count** for the first time since **1931**.

Key Facts

Constitutional and legal basis

- The Census is a **Union subject**, under **Entry 69** of the **Union List**.
- It is conducted by the **Registrar General and Census Commissioner of India**, under the **Ministry of Home Affairs**.
- It is carried out under the **Census Act, 1948 [S]**.
- The decision to add caste enumeration was taken by the **Cabinet Committee on Political Affairs (CCPA)**.

Two phases

- **Phase I:** Houselisting and Housing Census (HLO).
- **Phase II:** Population Enumeration (PE).

Digital features

- Enumerators collect data through a **mobile app** on their own smartphones.
- The app and self-enumeration portal are available in **16 languages**.
- Field work is tracked through the **Census Management and Monitoring System (CMMS)** portal.

History of the Census

- The **first attempt** was in **1872** under **Lord Mayo**, but it was **non-synchronous**.
- The **first synchronous** Census was held in **1881** under **Lord Ripon**, and it has been held every **10 years** since.
- **1951** was the **first Census** after Independence.
- Until **2011**, every Census counted only **SCs and STs**. The **SECC 2011** was a **separate** exercise, not part of the regular Census.

Mains Angle

- Caste data can support **evidence-based** welfare and reservation policy.
- Critics fear it may **deepen caste identities** in politics.
- The **five-year delay** has left policy dependent on **outdated 2011** data.
- A **digital Census** raises questions of **data privacy** and the **digital divide**.

Conclusion ; Census 2027 will shape India's **welfare, representation and delimitation** for the next decade.

Women's Reservation, the 106th Amendment and the NCW Workshop

Why in News

- **Lok Sabha Speaker Om Birla** inaugurated a workshop on "**Gender-Responsive Governance**" by the **National Commission for Women (NCW)** in **Faridabad** (7 September 2026).
- He highlighted **33% reservation for women** in the **Lok Sabha and State Assemblies** as key to **women's political leadership**.

Key Facts

The 106th Amendment Act, 2023

- It inserts **Articles 330A and 332A**, which provide for women's seats in the **Lok Sabha and State Assemblies**. It also adds **Article 334A**, which links its start to delimitation.
- It provides **33% reservation** in the **Lok Sabha, State Assemblies** and the **Delhi Legislative Assembly** (under **Article 239AA**).
- It includes a **sub-quota** for **SC/ST women** within the existing **SC/ST seats**.
- The reservation lasts **15 years**, and can be **extended** by Parliament.
- It does **not** apply to the **Rajya Sabha** or **State Legislative Councils**.

Local bodies

- The **73rd and 74th Amendments (1992)** gave **one-third** reservation to women in **Panchayats and Municipalities (Articles 243D and 243T)**.
- Several States, including **Odisha [S] [OD]**, have raised this to **50%**.

About the NCW

- The NCW is a **statutory body** set up under the **National Commission for Women Act, 1990**.
- It safeguards women's **rights and interests**, and reviews laws affecting women.

Mains Angle

- Reservation can move women from **voters** to **lawmakers**.
- Linking it to **Census and delimitation** delays its benefits.
- Local-body experience shows the risk of **proxy representation** by male relatives.
- **Capacity building** is needed for women leaders to work effectively.

Conclusion ; The 106th Amendment promises a **historic shift** in political power, but its impact depends on **timely implementation**.

Pension Sakhis: SHG Women as Retirement Guides

Why in News

- The **Department of Rural Development (DoRD)** and the **PFRDA** signed an MoU to launch "**Pension Sakhis**".

- These community workers will spread **pension awareness** in rural areas through the women-led SHG network under DAY-NRLM.

More on the News

- The initiative uses the existing **SHG network of DAY-NRLM**, so **no parallel network** is created.
- It targets **SHG members, rural women and Lakhpati Didis** who lack **retirement advice**.
- Progress will be tracked through **dashboards** and **DoRD's LoKoS system**.
- The **MoU** was signed by **DoRD Joint Secretary Amit Shukla** and **PFRDA Executive Director Sumeet Kaur Kapoor**.

Key Facts

Functions of Pension Sakhis

- Spreading **awareness** on **retirement security**.
- Helping with **enrolment** in **pension schemes**.
- Giving **post-enrolment support** to subscribers.

Institutions

- **PFRDA** is the **statutory pension regulator** under the **PFRDA Act, 2013**. It regulates the **NPS** and **Atal Pension Yojana**.
- **DAY-NRLM** is the **rural livelihoods mission** of the **Ministry of Rural Development**.

Mains Angle

- **Bank access** does not automatically lead to **retirement planning**, especially for households with **irregular incomes**.
- The initiative shifts financial inclusion from **access** to **informed, long-term saving**.
- **Women-led** trust networks often work better than formal outreach in villages.
- It extends the role of **NRLM cadres** from **livelihoods** to **lifelong security**.

Conclusion ; Pension Sakhis turn **SHG trust** into a bridge for **rural old-age security**.

Social Security for Informal and Gig Workers

Why in News

- Only about **8.58 lakh gig workers** had registered on **e-Shram** by January 2026, despite a **Budget promise** of health cover for **over 1 crore**.

- The **Union Cabinet** raised the **EPFO wage ceiling** from **₹15,000 to ₹25,000** a month.
- The **PM Kisan Maandhan Yojana** completed **7 years**, and a **National BOCW Conference** was held in **Mumbai**.
- About **5 in 6 gig workers** remain outside the **welfare system**.

Gig Workers and e-Shram

- **Gig workers** do **short-term, task-based work** without a regular employer. **Platform workers** do so through **apps**.
- The **Code on Social Security, 2020** first legally defined gig and platform workers. The **labour codes** came into force in **November 2025**.
- **e-Shram (2021)** is a **National Database of Unorganised Workers**, **Aadhaar-seeded**, that issues a **UAN**.
- **Budget 2025–26** promised gig workers **AB-PMJAY cover (₹5 lakh per family a year)**.

EPFO

- A **statutory body** under the **EPF&MP Act, 1952**, under the **Ministry of Labour**, run by a **tripartite Central Board of Trustees**.
- It runs three schemes: **EPF, EPS (1995)** and **EDLI (1976)**, which gives **life insurance**.
- The **wage ceiling** is the salary up to which **EPFO membership is mandatory**.

PM Kisan Maandhan Yojana (2019)

- A **voluntary, contributory Central Sector pension scheme** for **small and marginal farmers** (up to **2 ha**, aged **18–40**).
- It gives **₹3,000 a month** after **60**, with a **50% family pension**. **LIC** manages the fund.

Mains Angle

- India's **informal and gig workforce** largely lacks **social protection**.
- **Low registration** reveals gaps in **awareness and outreach**.
- **Portability of benefits** is vital for **migrant and construction workers**.
- **Contributory schemes** need **regular incomes**, which informal workers often lack.

Conclusion ; India is building a **social security floor** for informal workers, but **registration and delivery** remain the weak links.

Mental Health as the Anchor of Public Health

Why in News

- As India moves towards **Viksit Bharat 2047**, the focus on **Ayushman Bharat, primary care** and **lower out-of-pocket costs** has highlighted a gap.
- Experts argue that **mental health** must move to the **core** of India's public health system, rather than remain a secondary concern.

More on the News

- Mental illness affects about **1 in 7 Indians**, and nearly **200 million** people live with a diagnosable condition.
- The **treatment gap** is about **84.5%**, so over **four in five** people who need care do not get it.
- India has only about **0.3–0.75 psychiatrists per lakh** people, against a WHO norm of about **3**. It has about **9,000** psychiatrists and needs about **36,000** more.
- Mental health receives only about **1%** of the **health budget**.

Key Facts

The scale of the challenge

- The **National Mental Health Survey (2015–16)** found a prevalence of about **10.6%**.
- The share of mental disorders in India's **disease burden** has **doubled** in three decades.
- Over **60%** of **primary-care** patients have a diagnosable mental disorder. **Anxiety and depression** are much higher among people with **diabetes, hypertension, TB and HIV**.
- Mental and physical health form a **two-way link**, so neglecting one weakens control of the other.

The economic case

- A **2025** study estimated that universal **depression screening** in primary care could save **₹291–482 billion** a year, up to **0.32% of GDP**.
- Mental illness may cost India over **\$1 trillion** across **two decades**.

Foundations already in place

- Ayushman Arogya Mandirs:** Over **1.73 lakh** centres include mental healthcare in their service package.
- District Mental Health Programme:** It covers over **90%** of districts (**750+**).

- Tele-MANAS** (October 2022): A **24×7** tele-mental-health service in **20 languages**, which has handled about **30 lakh** calls. Its helpline number is **14416** [S].
- Mental Healthcare Act, 2017:** It guarantees the **right to access** mental healthcare, mandates **insurance parity**, and follows a **rights-based** approach with **advance directives** and **nominated representatives**.

Community models

- Zimbabwe's Friendship Bench**, India's **Atmiyata** and **The Live Love Laugh Foundation** show how trained **lay workers** can close the care gap.
- India's **10 lakh ASHA workers** can be trained to **identify and refer** common mental disorders, as tried in **Madhya Pradesh**.

Mains Angle

- India's health system is **curative and specialist-centred**, while mental health needs **prevention and community care**.
- The treatment gap is worst among **rural, tribal and poor** people, and among **women, the elderly and youth**, which makes it a **social justice** issue.
- Stigma** is often a bigger barrier than infrastructure.
- Student stress, social media** and **workplace burnout** make it a **demographic dividend** concern.
- High **Tele-MANAS** call volumes show **unmet need**, not necessarily **recovery**.

Way Forward

- Add **mental health screening** to all primary care at **Arogya Mandirs**.
- Expand the **workforce**: more psychiatry seats, psychologists, counsellors and nurses.
- Scale **task-sharing** with **ASHAs and ANMs**, under supervision.
- Raise the **budget share**, and extend **PM-JAY outpatient** cover.
- Enforce **insurance parity** under the 2017 Act.

Conclusion ; A **mentally healthy** population is the foundation of a **productive and humane** Viksit Bharat.

Health Watch

AMR: Resistant Infections Cost More Lives and Money

- An ICMR study found that **antibiotic-resistant** infections cause **more deaths** and **higher costs** than normal infections.
- The death risk was higher by **41%** for *E. coli*, **33%** for *K. pneumoniae*, **16%** for *A. baumannii* and **43%** for *P. aeruginosa*.
- In **bloodstream infections**, mortality was **39.3–50.8%**, and over **85%** were **hospital-acquired**.
- Treating resistant *E. coli* costs nearly **twice** as much, even counting **antibiotics alone**.
- **Carbapenems** are **last-resort**, broad-spectrum antibiotics, and resistance to them is rising.
- **AMR** occurs when **bacteria, viruses, fungi or parasites** stop responding to medicines. Its main causes are **misuse** of antibiotics in humans and animals, and **poor hygiene**.

A Fungus Resists a Transplant Drug

- The fungus *Pneumocystis jirovecii* has developed resistance to **mycophenolic acid (MPA)**, an **immunosuppressant** used by **organ-transplant** patients.
- MPA blocks the enzyme **IMPDH** in human immune cells. The fungus has a **similar enzyme**, and **six mutations** in it allow it to survive the drug.
- This is a rare case of **AMR** driven by a **non-antifungal drug**, so **human-targeted** medicines can also create resistance.
- The fungus causes **Pneumocystis pneumonia (PCP)**, which mostly affects **transplant** recipients and people with **advanced HIV**. It is normally treated with **co-trimoxazole**.
- The **WHO Fungal Priority Pathogens List (2022)** names **19 fungi**. *P. jirovecii* is in the **medium** group, while the **critical** group includes *Candida auris* and *Aspergillus fumigatus*.
- India launched its first **National Action Plan on AMR** in **2017**, and **NAP-AMR 2.0 (2025–29)** in **November 2025**.

Drugs Rules Amendment: CCTV at Medical Stores

- The Health Ministry proposed amendments to the **Drugs Rules, 1945** (Draft G.S.R. 791(E), **8 September 2026**), including **mandatory CCTV** at medical stores.
- The aim is tighter oversight of **Schedule H, H1 and X** drugs.

- **Schedule H** drugs need a **prescription**. **Schedule H1** covers some **antibiotics** and **anti-TB** drugs, which need **stricter records** to curb AMR. **Schedule X** covers **narcotic and psychotropic** drugs under the strictest controls.
- The **DTAB** is the main **technical advisory** body on drug regulation, and the **DCC** ensures **uniform** enforcement across States.

Rare-Disease Drugs: A New Pharma Opportunity

- Researchers at the **Tata Institute for Genetics and Society** say **rare-disease drugs** could become a new pharma opportunity, backed by easier **regulation, PLI** and **government procurement**.
- There are about **8,000** rare diseases worldwide, and **1,004** rare genetic disorders have been reported in India. Drugs exist for only about **5%** of them.
- **Orphan drugs** are medicines for rare diseases, so called because small patient numbers deter industry.
- **Endogamy** raises the prevalence of some diseases, such as **beta-thalassemia**, which reaches **10.5%** in some groups.
- The **US Orphan Drug Act, 1983** gave **tax incentives** and **seven years of market exclusivity**.
- Under **Rule 101** of the **New Drugs and Clinical Trials Rules, 2019**, the **CDSCO** can waive fresh trials for drugs approved in **six specified countries**.
- India's generics fill **47%** of **US generic** prescriptions, which earns it the title "**pharmacy of the world**".

National HPV Vaccination Campaign Crosses 80 Lakh Doses

- India has given over **80 lakh** HPV vaccine doses under the campaign launched in **February 2026**.
- It targets **14-year-old girls** with a **free, single-dose, voluntary** vaccine, given with **parental consent**.
- About **1.2 crore** girls turn 14 each year.
- **HPV** spreads mainly through **sexual contact**, and is the leading cause of **cervical cancer**.
- Coverage is tracked on the **U-WIN** digital platform, and every site is linked to **24×7 care for AEFI** (adverse events).

Bhutan Eliminates Dog-Transmitted Rabies

- **Bhutan** is the **first** country in the **WHO South-East Asia Region** to eliminate

dog-mediated rabies as a public health problem. Its last rabies death was in **June 2023**.

- WHO validates elimination after **zero deaths** for at least **two years**, plus proven capacity to prevent a **comeback**.
- Rabies is a **viral zoonotic** disease, and is almost always **fatal** once symptoms appear.
- About **59,000** people die of rabies globally each year. **India** accounts for about **one-third** (about **20,000**), the highest of any country.
- About **96%** of cases are linked to **dog bites**. Rabies is endemic across India except **Andaman and Nicobar** and **Lakshadweep**.
- The strategy rests on **mass dog vaccination** and **Post-Exposure Prophylaxis**: wound washing, the vaccine course and immunoglobulins. The global goal is **"Zero by 30"**.

9th Rashtriya Poshan Maah

- The **9th Poshan Maah** began on **9 September 2026** in **Varanasi**, on the theme **"Hamari Anganwadi, Hamari Jimmedari"**.
- It marks **10 years** of the **PMMVY** maternity benefit scheme → See Part K.
- **Mission Poshan 2.0** (Budget **2021–22**) merged **POSHAN Abhiyaan**, **Anganwadi Services** and the **Scheme for Adolescent Girls**, under the **Ministry of Women and Child Development**.
- Over **85%** of brain development happens by **age six**, with the fastest growth in the **first 1,000 days**.

Urban India: Swachh Vayu Sarvekshan 2026

Why in News

- The **MoEFCC** announced the **Swachh Vayu Sarvekshan (SVS) 2026** results on **7 September 2026**.
- **Lucknow** ranked first among **million-plus cities**, followed by **Indore** and **Jabalpur**.

More on the News

- Awards were given on **Swachh Vayu Diwas**, observed with the **International Day of Clean Air for Blue Skies**.
- **Odisha cities** swept the smaller categories [OD]: **Rourkela** topped **3–10 lakh**, and **Kalinga Nagar, Angul and Talcher** took the top three below **3 lakh**.
- **Delhi** ranked **30th** and **Mumbai 37th**. The bottom five were **Chennai, Jamshedpur, Kota, Kolkata and Madurai**.

- For the first time, **municipal wards** that improved air quality were also honoured.

Key Facts

Results

- **Above 10 lakh: Lucknow, Indore, Jabalpur.**
- **3–10 lakh: Rourkela**, then **Firozabad and Guntur** (joint second), then **Amravati**.
- **Below 3 lakh: Kalinga Nagar, Angul, Talcher.**

City Achievements

- **Lucknow** used **electric waste vehicles, mechanised sweepers** and better **legacy-waste handling**. Its **PM10** fell **45.2%** (250 to **137 µg/m³**), but is still above the **60 µg/m³** standard.
- **Jabalpur** has a **waste-to-energy plant** and **100% waste collection**.

About SVS

- Started in **2022–23**, it ranks about **130 non-attainment cities** in **three population categories**.
- It assesses **waste, road dust, construction waste, vehicles and industry**. **PM10 improvement** has only **2.5% weightage**, so it rewards **action, not readings**.

About NCAP

- The **National Clean Air Programme (January 2019)** is India's first programme with **city-specific air targets**.
- It covers **131 non-attainment cities**, which failed to meet the **NAAQS** for **five years**.
- It targets a **40% cut in PM10 by 2025–26** (base **2017–18**), with **performance-linked funding**.

Mains Angle

- **Action-based rankings** may reward effort without proving **cleaner air**.
- Even **top cities** still exceed **national PM10 standards**.
- Air pollution needs **regional (airshed) action** beyond city limits.
- **Performance-linked funding** promotes **competitive federalism** among cities.

Conclusion ; SVS rewards effort, but India's real test is **meeting air-quality standards on the ground**.

PART K : ETHICS CASE STUDIES**Case 1: The Booth Level Officer and the Deletion Target**

You are a **Booth Level Officer (BLO)** during the **Special Intensive Revision**. Your supervisor asks you to mark 200 voters for deletion by Friday to meet the district target. Many of them are migrant workers who are away for work but still live in the area. Missing the target may affect your annual appraisal.

Question: What are the ethical issues, and what would you do?

Key Points

- **Dilemma:** Duty to obey a superior versus the **right to vote** of genuine citizens.
- **Stakeholders:** Voters, the BLO, the supervisor, the ECI and **public trust** in elections.
- **Values involved:** Integrity, impartiality, fairness and **courage of conviction**.
- **Action:** Verify each case on the ground, record reasons in writing, and report the target pressure to senior officers.
- **Guiding principle:** “Better to include than wrongly exclude.”

Case 2: The District Collector and Stubble Burning

You are the **District Collector** of a district in Punjab. Satellite data shows a sharp rise in farm fires. The State wants strict use of the new “**red entry**” rules. However, most offenders are **small farmers** who cannot afford **Happy Seeders**, and the wheat sowing window is only two weeks away.

Question: How would you balance enforcement with fairness?

Key Points

- **Dilemma:** **Public health** of millions versus the **livelihood** of poor farmers.
- **Stakeholders:** Farmers, Delhi-NCR residents, children and the elderly, the **CAQM** and the State government.
- **Values involved:** Compassion, rule of law, justice and **responsibility to future generations**.
- **Action:** Set up **custom hiring centres** for machines, spread awareness, link farmers to **biomass buyers**, and penalise only repeat offenders.

- **Guiding principle:** Persuasion first, punishment last.

Case 3: The Vice-Chancellor and the Convocation

You are the **Vice-Chancellor** of a **State-funded university**. At the last convocation, some students were asked to **bow during religious chants**. A group of students and faculty complained that this violated their **freedom of conscience**. Another group says it is only a **cultural tradition**.

Question: What steps would you take as head of the institution?

Key Points

- **Dilemma:** **Respect for tradition** versus **freedom of conscience** and **secularism**.
- **Stakeholders:** Students, faculty, the university's reputation and society.
- **Values involved:** Tolerance, inclusiveness, neutrality and **constitutional morality**.
- **Action:** Adopt a **written ceremonial protocol**, keep all gestures **voluntary**, and set up an **independent grievance cell**.
- **Guiding principle:** **Article 28(1)** and the **Bijoe Emmanuel (1986)** spirit, where respectful non-participation is not disrespect.

Case 4: The NGO Hospital and the FCRA Deadline

You are a **District Magistrate** in a **tribal district**. The only hospital within 60 km is run by an NGO. Its **FCRA registration** has ended because of a delay in renewal paperwork. Under the new rules, its **foreign-funded assets** may pass to the government. Patients and staff are worried that the hospital will close.

Question: How would you ensure both legal compliance and public welfare?

Key Points

- **Dilemma:** **Strict compliance** with the law versus **access to healthcare** for vulnerable people.
- **Stakeholders:** Tribal patients, hospital staff, the NGO, the **MHA** and the district administration.
- **Values involved:** Empathy, **accountability**, objectivity and **public service**.
- **Action:** Help the NGO apply for restoration, ensure **uninterrupted services** during the process, and give it a fair hearing.
- **Guiding principle:** The law should **regulate**, not **punish** service delivery.

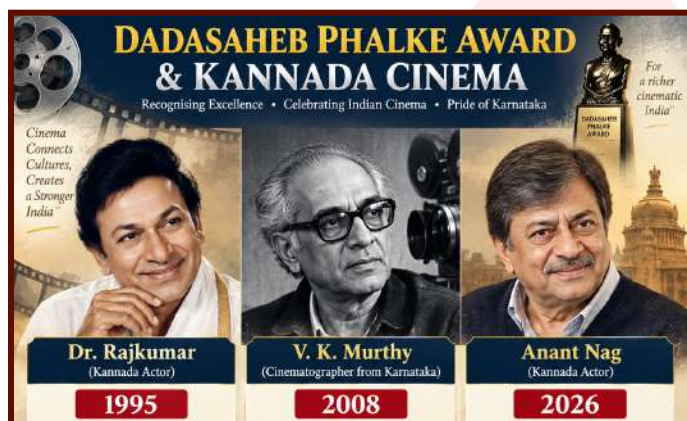
PRELIMS BOOSTER

GS PAPER I

Art, Culture & Personalities

Dadasaheb Phalke Award 2024

- Veteran Kannada actor **Anant Nag** received it at the **72nd National Film Awards** in Kevadia, Gujarat.
- He is only the **second artist from Karnataka** to win it, after **Dr. Rajkumar (1995)**. **V.K. Murthy (2008)** was from Karnataka but won for Hindi cinema.
- The award was **instituted in 1969** and is given by the **Ministry of Information and Broadcasting**.
- **Dadasaheb Phalke** made India's first full-length feature film, "**Raja Harishchandra**" (1913).



Ramon Magsaysay Award 2026

- It is often called the "**Nobel Prize of Asia**". It was established in **1957** and is given by a foundation in **Manila, Philippines**.
- It is named after **Ramon Magsaysay**, the **third President of the Philippines**.
- **Tommy Koh (Singapore)** won for promoting the rule of law. He presided over the conference that adopted **UNCLOS (1982)**.
- **Bo Kyi (Myanmar)**, a democracy activist, co-founded the **Assistance Association for Political Prisoners (2000)**.
- **Runa Khan (Bangladesh)** founded "**Friendship Bangladesh**" (2002), which works on climate, education and livelihoods.



Sir M. Visvesvaraya and Engineers' Day

- **National Engineers' Day** falls on **15 September**, his birth anniversary. It has been observed since **1968**.
- He was chief engineer of the **Krishna Raja Sagara (KRS) Dam** and designed **Hyderabad's flood protection system**.
- He served as **Diwan of Mysore (1912–1918)** and received the **Bharat Ratna (1955)**.
- The 2026 theme was "**Engineering Excellence for a Sustainable and Technologically Sovereign India**".

Geography

Mahanadi River

- It rises in the **Sihawa hills, Dhamtari (Chhattisgarh)** and flows east into the **Bay of Bengal near Paradip (False Point)**.
- Its length is about **851 km**, and its basin covers about **4.3% of India's area**.
- **Left-bank tributaries:** Seonath, Hasdeo, Mand, Ib. **Right-bank tributaries:** Ong, Tel, Jonk.
- **Hirakud Dam (Sambalpur)** is among the **longest earthen dams** in the world, about **26 km** including its dykes.
- It cuts through the **Eastern Ghats** at the **Satkosia Gorge**, which became a **Ramsar site in 2021**. It enters the delta at **Naraj, near Cuttack**.
- Its distributaries feed **Chilika Lake**. Historic floods earned it the name "**Sorrow of Odisha**".
- The **Mahanadi Water Disputes Tribunal (2018)** is hearing the **Odisha–Chhattisgarh** dispute. Odisha objects to **upstream barrages and anicuts**.
- An **anicut** is a small weir used to store or divert water, mainly for irrigation.
- **Article 262** deals with inter-State river disputes, while **Article 263** deals with the **Inter-State Council**. A tribunal decides the dispute, and the **CWC** only gives technical input.



Brahmani River

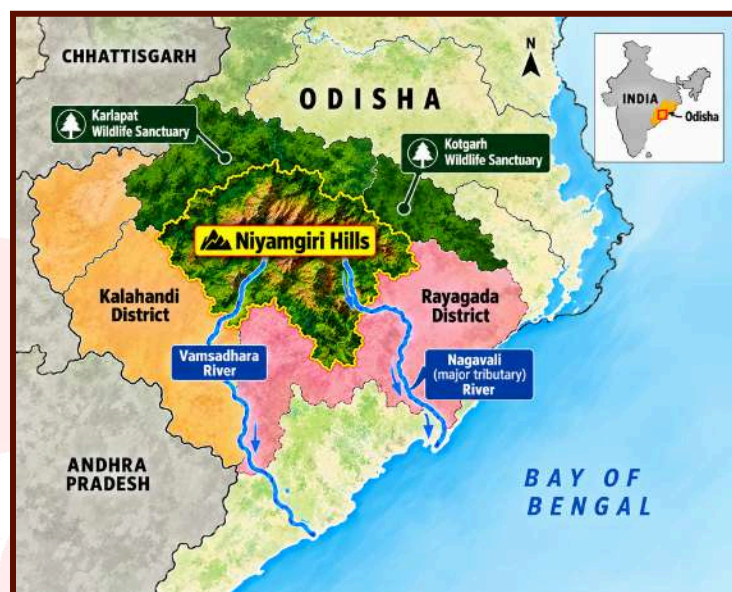
- It is the **second-largest river of Odisha**, after the Mahanadi.
- It is formed by the **South Koel** and **Sankh** rivers near **Rourkela**. Both rise in **Jharkhand**.
- The **Rengali Dam** on it serves hydropower, irrigation and flood control.
- It shares a **common delta with the Baitarani** and enters the sea near **Dhamra**.
- The delta holds **Bhitarkanika National Park**, a **Ramsar site** known for mangroves and the **saltwater crocodile**.
- Nearby **Gahirmatha** is a major **Olive Ridley turtle** nesting site.



Niyamgiri Hills and Bauxite

- The hills lie in **Kalahandi** and **Rayagada** districts, in the **Eastern Ghats**.
- The **Vamsadhara** is a major tributary of the **Nagavali** rise here.
- They are bordered by **Karlapat WLS** (north-west) and **Kotgarh WLS** (north-east).
- The **Dongria Kondh**, a **PVTG**, worship **Niyam Raja** here. "Dongar" means hill.

- Bauxite** is the main ore of **aluminium**. It forms through **intense chemical weathering** in tropical regions.
- Major bauxite States are **Odisha, Gujarat, Jharkhand, Maharashtra, Chhattisgarh** and **Madhya Pradesh**.



Falkland Islands (Islas Malvinas)

- They lie in the **South Atlantic**, about **480 km east of Argentina**, on the **Patagonian Shelf**.
- The two main islands are **East Falkland** (capital **Stanley**) and **West Falkland**, separated by the **Falkland Sound**.
- They are a **British Overseas Territory**. In the **2013 referendum**, islanders voted to stay British.
- Argentina claims them on the basis of **Spanish succession** and **geographical proximity**.



Nauru Renamed Naoero

- The new name was announced at the **81st UNGA**. The country code changes from **NRU to NRO**, and its people will be called **dei-Naoero**.
- It is the **smallest island nation and smallest republic**, at about **21 sq km**, located just south of the **Equator** in **Micronesia**.
- It has **no official capital**. Government offices are in **Yaren**, and it uses the **Australian dollar**.
- It became independent in **1968** and joined the **UN** in **1999**. Its economy was built on **phosphate mining**.
- **Other name changes:** Ceylon → Sri Lanka (1972), Burma → Myanmar (1989), Swaziland → Eswatini (2018), Macedonia → North Macedonia (2019) and Turkey → Türkiye (2022).



Society

Literacy: ULLAS and NIPUN Bharat

- A State/UT is **fully literate** at **95% literacy**. **10 States/UTs**, including **Ladakh, Mizoram, Goa, Sikkim and J&K**, declared full literacy in **2024–26**.
- **ULLAS (Understanding of Lifelong Learning for All in Society)** is a **Centrally Sponsored Scheme** for adults aged **15+**. It targets **5 crore learners (2022–27)**, who are certified through the **FLNAT (Foundational Literacy and Numeracy Assessment Test)**.
- **NIPUN Bharat (National Initiative for Proficiency in Reading with Understanding and Numeracy)**, **2021** works under **Samagra Shiksha** to achieve **foundational literacy and numeracy** by **2026–27**.
- Literacy rose from **18.32% (1951)** to **74.04% (2011)**. **Kerala** was highest and **Bihar** lowest in 2011.
- The **PLFS (Periodic Labour Force Survey) 2025** puts literacy at **81.1% (age 7+)**.
- The **86th Amendment (2002)** added **Article 21A**. The **RTE (Right of Children to Free and**

Compulsory Education) Act, 2009 came into force on **1 April 2010**.

- **International Literacy Day: 8 September**.

Adoption and CARA

- **CARA** is a **statutory body** under the **JJ Act, 2015**, working under the **Ministry of WCD**.
- It is India's **Central Authority** under the **Hague Convention on Inter-Country Adoption (1993)**, which India ratified in **2003**.
- A **Child Welfare Committee** declares a child **"legally free for adoption"**. Adoption runs through the **CARINGS portal**.
- The **2021 amendment** empowered **District Magistrates** to issue adoption orders.
- The 2026 theme is **"Legal Adoption. Safe Childhood. Secure Future."**

GS PAPER II

Polity & Constitution

Bail

- **Section 479** allows bail after **half the maximum sentence**, or **one-third for first-time offenders**. It does not apply to offences punishable with **death or life imprisonment**.
- **Anticipatory bail** is granted only by a **High Court or Court of Session**.
- **Stricter bail rules** apply under **PMLA (Section 45)**, **UAPA (Section 43D)** and **NDPS (Section 37)**.

Special Investigation Team (SIT)

- An **SIT** is a **case-specific team** formed by a **court or government** when the original probe is doubtful.
- Unlike the permanent **CBI**, an **SIT** is **temporary** and may draw officers from several agencies.
- The Supreme Court ordered a **new SIT** for the **2012 Dharmasthala case**, excluding officers from the earlier probe.
- The **SIT on black money**, set up on the Supreme Court's direction, later got a legal basis under the **Black Money Act**.

Lieutenant Governor and Union Territories

- Under **Article 239**, UTs are administered by the **President through an administrator**, called a **Lieutenant Governor** in some UTs.

- An L-G holds office **at the President's pleasure**, so the President can give **additional charge** of another UT.
- Ladakh's L-G **Vinai Kumar Saxena** was given additional charge of **J&K**.
- The **J&K Reorganisation Act, 2019** created **J&K (with a legislature)** and **Ladakh (without one)**.

DISHA 2.0 and Access to Justice

- **DISHA** stands for **Designing Innovative Solutions for Holistic Access to Justice**. It is a **Central Sector Scheme** of the **Department of Justice**.
- **DISHA 2.0 (2026–31)** has an outlay of **₹255 crore**, fully funded by the Centre.
- Its four components are **Tele-Law**, **Nyaya Bandhu (pro bono help)**, **legal literacy (LLLAP)** and the **VIDHI-Sanjeevani** dashboard.
- The **Nyaya Setu AI chatbot (March 2026)** gives legal information in **22 languages**.
- **Article 39A** (free legal aid) was added by the **42nd Amendment, 1976**.
- The **Legal Services Authorities Act, 1987** backs legal aid, and **NALSA** was constituted in **1995**. **Lok Adalat awards** are final and binding.

Governance & Welfare Schemes

PM-AJAY (Anusuchit Jaati Abhyuday Yojana)

- It is a **100% Centrally Sponsored Scheme** of the **Ministry of Social Justice**, running since **2021–22**.
- It merged **PMAGY, SCA to SCSP** and **BJRCY**.
- It has three components: **Adarsh Gram**, **Grant-in-Aid** and **Hostels**.
- Villages with **40% or more SC population** and **500 or more people** qualify for infrastructure grants.
- So far, **16,022 villages** have been declared **Adarsh Gram**.
- **Article 341** lets the President specify SCs. **Article 338** sets up the **National Commission for SCs**.

PMAY-Urban 2.0

- **PMAY-U** was launched in **June 2015**. **PMAY-U 2.0 (2024–29)** targets **1 crore more families**.
- It gives assistance of up to **₹2.50 lakh per house**.
- Its four verticals are **Beneficiary-Led Construction (BLC)**, **Affordable Housing in Partnership (AHP)**, **Affordable Rental Housing (ARH)** and the **Interest Subsidy Scheme (ISS)**.

- So far, **1.25 crore houses** have been sanctioned, and about **1 crore** have been allotted to **women** (sole or joint owners).

PM Vishwakarma

- Launched on **17 September 2023**, it is a **Central Sector Scheme** of the **Ministry of MSME**.
- It covers **18 traditional trades** with an outlay of **₹13,000 crore (2023–28)**. It has reached its target of **30 lakh registrations**.
- Its three pillars are **Samman, Samarthya and Samriddhi**.
- It offers a **₹500 daily training stipend** and a **toolkit worth ₹15,000**.
- It gives **collateral-free loans of up to ₹3 lakh at 5% interest**, in two tranches of **₹1 lakh and ₹2 lakh**.

PMMVY and the Poshan Framework

- **PMMVY** is the flagship **maternity benefit scheme**, giving **cash through DBT** to pregnant and lactating women. 2026 marks **10 years**, with a **100% saturation drive**.
- **PMMVY 2.0** gives **₹5,000 for the first child** and **₹6,000 for a second girl child [S]**.
- **POSHAN Abhiyaan** began in **March 2018**. The **Poshan Tracker** was launched on **1 March 2021**.
- **Poshan Pakhwada** is held every **April**. Its **8th edition (2026)** focused on **brain development in the first six years**.

NAMASTE Scheme

- **NAMASTE** stands for **National Action for Mechanised Sanitation Ecosystem**. It is run by the **Ministry of Social Justice** with **MoHUA**.
- **NSKFDC** implements it. It replaced the earlier **SRMS** for manual scavengers.
- It aims to end **hazardous manual entry** into sewers and septic tanks. Workers are called **Safaimitras**.
- Workers get **PPE kits**, safety training and **Ayushman Bharat** health cover.
- **Manual scavenging** is banned under the **Prohibition of Employment as Manual Scavengers Act, 2013**.

Skilling and Recruitment Schemes

- **PM-SETU (MSDE)** upgrades **ITIs** through an **industry-led hub-and-spoke model**. **₹2,171 crore** has been sanctioned across **9 clusters**.

- **DDU-GKY** was launched on **25 September 2014** by the **Ministry of Rural Development**. It gives **placement-linked training** with at least **75% placement**.
- DDU-GKY reserves coverage for **SC/ST (50%), minorities (15%) and women (33%)**. It has special components **HIMAYAT (J&K)** and **ROSHNI (LWE areas)**. DDU-GKY 2.0 covers **2026–28**.
- **Rozgar Mela** was launched on **22 October 2022** to fill **10 lakh posts**. It has crossed **12.75 lakh appointment letters**.
- **NSDC (2008)** is a **not-for-profit PPP company**, with the government holding **49%**. **PMKVY** was launched on **15 July 2015**, **World Youth Skills Day**.

PM SHRI Schools

- It is a **Centrally Sponsored Scheme (2022–23 to 2026–27)** to upgrade **14,500+ existing schools** as **NEP 2020 models**. **13,092 schools** have been selected so far.
- Schools are chosen through a **“Challenge Mode”**, using **UDISE+ data** and inspection. The minimum score is **70% for urban** and **60% for rural schools**.
- They follow the **5+3+3+4** curricular structure of **NEP 2020**.

Health Infrastructure: PM-ABHIM

- **PM-ABHIM** builds pandemic-ready health systems, shifting from a **hospital-centric** to a **health-system approach**.
- **631 Critical Care Blocks** have been sanctioned nationwide.
- **Integrated Public Health Labs** strengthen **district-level disease surveillance**.
- **Andhra Pradesh** received **₹1,271.80 crore**. Its **Sanjeevani** programme tests **41 health parameters** at the doorstep.

Water: Jal Sanchay, Jan Bhagidari and JJM

- **JSJB** was launched on **6 September 2024** by the **Ministry of Jal Shakti**. It has built over **1.58 crore recharge structures**.
- It is guided by the **3Cs: Community, CSR and Cost**. In **June 2026**, it merged with **“Catch the Rain”**.
- **Odisha** uses the **CHHATA** scheme for rooftop rainwater and the **ARUA** scheme for aquifer recharge.

- Other State models are **Aawa Paani Jhoki (Chhattisgarh)** and **Kalajathas folk theatre (Andhra Pradesh)**.
- **Jal Jeevan Mission** was launched on **15 August 2019** for **“Har Ghar Jal”** tap connections.
- **JJM funding** is **100% for UTs, 90:10 for Himalayan and NE States** and **50:50 for others**.

International Relations

India–UAE CEPA and BRICS

- The **UAE joined BRICS in January 2024**.
- Under the **CEPA (2022)**, **non-oil trade grew 17% in 2025** to over **\$76 billion**. The target is **\$200 billion by 2032**.
- **Non-oil sectors** make up about **79% of UAE GDP**. Its sovereign wealth assets exceed **\$2.9 trillion**.
- The **New Development Bank** has approved over **\$40 billion** in financing.

New Delhi Declaration:

- It is a **140-paragraph declaration**. **India holds the Kimberley Process Chair** in 2026, the global scheme against **conflict diamonds**.
- **BRICS meeting venues in 2026:**
 - **Agra** hosted the first **SME Forum**.
 - **Nagpur** hosted the **Transport Ministers**.
 - **Chandigarh** hosted the **Health Ministers**.
 - **Indore** hosted the **Agriculture Ministers**.
 - **Kochi** hosted the **Women Ministers**.
 - **Bhubaneswar** hosted the **Education Ministers [OD]**.
 - **Bhopal** gave its name to the **Bhopal Declaration** on culture.
- The **Jaipur Consensus** will study **invoice discounting for MSMEs**.
- **BRICS** backed **Ethiopia’s COP32 presidency** and the **expansion of the ICAO Council**.
- The declaration criticised the **US blockade on Cuba**, citing **UNGA Resolution A/RES/80/4**.

India–China: Leaders’ Meeting and the Shaksgam Issue

- **Modi and Xi** met in **New Delhi**, on the sidelines of the **BRICS Summit**, on **12 September 2026**. Their previous meeting was in **Tianjin (August 2025)**.

- Modi set out the “**Three Mutuals**”: **mutual respect, mutual sensitivity and mutual interest**.
- India rejected the **Pakistan–China Boundary Joint Commission**, whose first meeting was held in **Islamabad**.
- Pakistan ceded the **Shaksgam Valley** to China under the **1963 Sino–Pakistan Agreement**, which India calls **illegal and invalid**.
- **CPEC** links **Gwadar Port** with **Xinjiang** and passes through **PoK**, so India opposes it.

New Trade Agreements and Tools

- **India–New Zealand FTA**: It has been ratified and aims to **double trade to ₹35,000 crore** in 4–5 years. **Dairy** has been kept protected.
- **India–MERCOSUR**: The **First Additional Protocol** to their PTA gives **electronic Certificates of Origin** the same validity as paper ones. MERCOSUR members are **Argentina, Brazil, Paraguay and Uruguay**.
- **DGFT Open API**: Exporters can now file **Certificates of Origin** directly through the **Trade Connect** platform (**Trade Notice 25/2026-27**).
- A **Preferential CoO** gives tariff benefits under FTAs, while a **Non-Preferential CoO** only proves origin.

BIMSTEC Traditional Medicine Conference

- The **3rd BIMSTEC Conference** on traditional medicine and IPR was held in **Goa**, hosted by the **All India Institute of Ayurveda**.
- BIMSTEC has **7 members**: **Bangladesh, Bhutan, India, Myanmar, Nepal, Sri Lanka and Thailand**.
- At the **6th Summit (Bangkok, April 2025)**, India proposed a **BIMSTEC Centre of Excellence in Traditional Medicine**.
- The **Traditional Knowledge Digital Library (TKDL)** documents traditional medicinal knowledge to prevent **biopiracy**.

Global Indices and Their Publishers

Index / Report	Publisher
Global Gender Gap Index	World Economic Forum (Geneva)
Gender Inequality Index, HDI	UNDP
Global Hunger Index	Concern Worldwide and Welthungerhilfe

Corruption Perceptions Index	Transparency International
Democracy Report (EDI, LDI)	V-Dem Institute, University of Gothenburg
Democracy Index	Economist Intelligence Unit (UK)
Freedom in the World	Freedom House (USA)
World Press Freedom Index	Reporters Without Borders (Paris)

- **V-Dem** rated India’s **electoral democracy** at its lowest since **1975**. The government has questioned the methodology.
- **UN CERD** monitors the **ICERD**, adopted in **1965** and in force from **1969**. Its review of India was the first since **2007**.

GS PAPER III

Economy

Industrial and Port Indicators

- In the **Index of Core Industries, Electricity (30.93%)** and **Refinery Products (22.57%)** carry the highest weights. Together, the eight core industries make up about **40% of the IIP**.
- In August 2026, **electricity grew 12.3%**, a **27-month high**, and **capital goods grew 16.9%**.
- **Kandla, JNPA and Paradip** were declared Mega Ports under **Section 73(2)** of the **Indian Ports Act, 2025**, as major ports.
- **Mundra**, a non-major port run by **Adani Ports**, was notified under **Section 73(3)**.
- The **Mega Port criteria** were notified on **30 July 2026**, after consulting the States.

ECLGS 5.0

- It was approved on **5 May 2026** and is run by the **National Credit Guarantee Trustee Company (NCGTC)**.
- It targets credit of up to **₹2.55 lakh crore**. It covers **MSMEs**, eligible **non-MSMEs** and **scheduled airlines**, through the **Jan Samarth Portal**.
- It gives **100% guarantee for MSMEs** and **90% for non-MSMEs**, with **no guarantee fee**. It runs until **31 March 2027**.
- Borrowers get up to **20% extra working capital**, capped at **₹100 crore**. Loans run for **5 years**, including a **1-year moratorium**.

- The original ECLGS began in **2020**, under **Atmanirbhar Bharat [S]**. The **Kamath Committee** had identified **26 stressed sectors**.

EPF Scheme 2026 Amnesty and the Labour Codes

- The amnesty is a **one-time window**, open until **28 December 2026**. It lets **PF Trusts** regularise their exemption status **with backdated effect**.
- It relates to **Section 17 of the EPF&MP Act, 1952** and **Section 143 of the Code on Social Security, 2020**.
- The four **Labour Codes** are the **Code on Wages (2019)**, the **Industrial Relations Code (2020)**, the **Code on Social Security (2020)** and the **OSH Code (2020)**.

Critical Minerals Framework

- The **Ministry of Mines** identified **30 critical minerals in 2023**.
- **KABIL** is a joint venture of **NALCO, HCL and MECL**. It acquires mineral assets abroad, such as **lithium blocks in Argentina**.
- The **MMDR Amendment Act, 2023** removed six minerals from the atomic list, opening them to private mining [S]. The six are **lithium, beryllium, niobium, titanium, tantalum and zirconium**.
- India's first major **lithium find** is at **Salal-Haimana (Reasi, J&K)**, reported by the **GSI**.

Tourism: World Tourism Day 2026

- It is observed on **27 September** and marks the adoption of the **UNWTO statutes (1970)**. It was first celebrated in **1980**.
- The **2026 host** was **El Salvador**, and India celebrated at **Bharat Mandapam**. The theme was the **Digital Agenda and AI in tourism**.
- India's **e-Visa (2014)** covers **172 countries**. Tourism schemes include **Swadesh Darshan 2.0**, **PRASHAD (pilgrimage sites)**, **NIDHI+** and **Dekho Apna Desh 2.0**.

Steel Slag Road Record

- A **1.85-km road** at **Raigarh, Chhattisgarh** set a **Guinness World Record** for the longest road built with **processed steel slag**.
- It was developed by **CSIR-CRRI** and **Jindal Steel** under the "**Steel Grit**" brand.

- Such roads cost about **40% less**, are about **four times stronger**, and need major repairs only after about **15 years**.

Agriculture

MSP and Cropping Seasons

- MSP covers **22 crops**:
 - **14 Kharif crops**: paddy, jowar, bajra, ragi, maize, arhar, moong, urad, groundnut, sunflower, soybean, sesamum, nigerseed and cotton.
 - **6 Rabi crops**: wheat, barley, gram, masur, rapeseed-mustard and safflower.
 - **2 commercial crops**: jute and copra.
- **Sugarcane** gets an **FRP**, not an **MSP**. **MSP** is recommended by the **CACP** and approved by the **CCEA**.
- **Rabi crops** are sown in **October–December** and harvested in **March–April**.
- **Kharif crops** are sown in **June–July** and harvested in **September–October**.
- **Zaid crops**, such as **watermelon** and **cucumber**, grow between the rabi and kharif seasons and depend on **irrigation**.

PM-RKVY and Khet Bachao Abhiyan

- **PM-RKVY** is a **Centrally Sponsored Scheme** that gives States flexible farm funds. It grew out of **RKVY (2007–08)**.
- The Centre released over **₹1,200 crore** to **10 States** for the **Rabi Campaign 2026**.
- **Khet Bachao Abhiyan** runs from **22 October** to **30 November 2026**. It promotes **balanced fertiliser use** based on **Soil Health Cards**.
- **Agriculture** falls under **Entry 14 of the State List**.
- The **Soil Health Card** scheme began in **2015**, **PMFBY** in **2016** and **KCC** in **1998**.

PM Dhan-Dhaanya Krishi Yojana and KVKs

- **PM-DDKY** was launched on **11 October 2025** for **100 districts** with low productivity, low cropping intensity and low credit.
- It is modelled on the **Aspirational Districts Programme**. It brings together **36 schemes of 11 Ministries**.
- It has an outlay of **₹24,000 crore a year** for **6 years** and expects to benefit about **1.7 crore farmers**.
- Progress is tracked through **121 indicators**. The average district score rose from **22.54 to 38.85** between **April and July 2026**.

- KVKs work under ICAR, and the first KVK opened in Puducherry (1974). The plan is to upgrade 300 KVKs by March 2027.

Sugarcane Agronomy

- It needs 21–27°C temperatures, 75–150 cm of rainfall and well-drained loamy soil.
- It takes 10–18 months to mature. It is grown from stem cuttings (setts), and a second harvest is called a ratoon crop.
- UP, Maharashtra and Karnataka lead production, and Brazil is the world's largest producer.
- The sugar season runs from October to September. Bagasse is used for power through cogeneration.

Tea: Static Facts

- The Tea Board was set up under the Tea Act, 1953, under the Ministry of Commerce.
- GI teas include Darjeeling (India's first GI, 2004), Assam Orthodox (2007), Nilgiri Orthodox and Kangra [AS].
- Camellia sinensis (China variety) has smaller leaves, while Camellia assamica (Assam variety) has broader ones.
- Orthodox tea uses traditional processing, unlike the CTC (Crush, Tear, Curl) method.

Fisheries and Aquaculture

- India is the second-largest fish producer, with about 8% of world output. It is also the largest shrimp producer and exporter.
- Fish production was about 195–198 lakh tonnes in 2024–25. Seafood exports reached ₹73,890 crore in 2025–26.
- PMMSY was launched in September 2020 with ₹20,050 crore and extended to 2025–26. Its forerunner was the Blue Revolution (2015–16).
- FIDF (2018–19) gives up to 3% interest subvention for fisheries infrastructure. KCC has been extended to fishers.
- PM-MKSSY (February 2024) pays up to 40% of the aquaculture insurance premium, capped at ₹1 lakh. SC, ST and women get an extra 10%.
- Recirculatory Aquaculture Systems (RAS) reuse 90–95% of water. Biofloc uses microbes to treat water and feed fish.
- Fisheries fall under Entry 21 of the State List. Fishing beyond territorial waters falls under Entry 57 of the Union List.

Environment & Ecology

Nandankanan Zoological Park and Rescued Orangutans

- Five baby orangutans smuggled into the country were rescued in Balasore and taken to Nandankanan.
- Nandankanan lies near Bhubaneswar, beside Kanjia Lake, and was set up in 1960. It became a sanctuary in 1979.
- It was the first zoo in the world to breed white tigers in captivity (1980) and also the first to breed melanistic tigers.
- It runs the world's only conservation breeding centre for the Indian pangolin. It was the first Indian zoo to join WAZA (2009).
- It is one of only two zoos in India with orangutans, the other being Kanpur.
- All three orangutan species (Bornean, Sumatran and Tapanuli) are Critically Endangered and listed in CITES Appendix I. They are native only to Borneo and Sumatra.

Access and Benefit-Sharing: NBA Crosses ₹200 Crore

- The National Biodiversity Authority (Chennai) works under the Biological Diversity Act, 2002.
- It released ₹8.23 crore to 27 SBBs and 5 UTBCs from the commercial use of bitter melon, okra, chilli and onion. MP and Maharashtra were the largest recipients.
- The law has a three-tier structure: NBA → State Biodiversity Boards → Biodiversity Management Committees (BMCs). BMCs prepare People's Biodiversity Registers.
- India's ABS system follows the CBD, the Nagoya Protocol and Target 13 of the Kunming–Montreal GBF.

NGT Jurisdiction

- The NGT hears cases under 7 laws:
 - Water Act (1974)
 - Water Cess Act (1977)
 - Forest (Conservation) Act (1980)
 - Air Act (1981)
 - Environment (Protection) Act (1986)
 - Public Liability Insurance Act (1991)
 - Biological Diversity Act (2002)
- The Wildlife (Protection) Act, Forest Rights Act and Indian Forest Act fall outside its jurisdiction.

India–Japan Forest Cooperation

- The **India–JICA forest project (2025–32)** has an outlay of **₹537.10 crore**, of which **JICA gives ₹440.42 crore**. It trains frontline forest staff.
- The **7th Joint Working Group on Forests** met in **Bengaluru** under a **2015 Memorandum of Cooperation**. It endorsed a **2027–31 Roadmap**.
- The talks covered **Trees Outside Forests**, **forest genetics** and the **“Forest Stack”** digital monitoring system.
- Field visits included **IWST Bengaluru**, **sandalwood farms in Mysuru** and **Nagarhole Tiger Reserve**.

Coastal and Sanitation Campaigns

- **“Swachh Sagar, Surakshit Sagar” 5.0** runs from **12–19 September 2026**, led by the **Ministry of Earth Sciences** and **NIOT**.
- **Swachhata Hi Seva** has been held every year since **2017**, except **2020**.
 - **2023**: “Garbage-Free India”.
 - **2024**: “Swabhav Swachhata, Sanskaar Swachhata”.
 - **2025**: “Swachhotsav”.
 - **2026**: “Swachhata Mein Sahbhag”.
- Villages move through three **ODF Plus** stages: **Aspiring → Rising → Model**.
- Public toilets are rated on **FACES: Functional, Accessible, Clean, Eco-friendly and Safe**.

Natural Gas Transition

- The **Army** plans to move **41 stations** to **Piped Natural Gas** in **FY 2026–27**.
- **PNGRB**, a statutory body under the **PNGRB Act, 2006**, regulates **City Gas Distribution** networks.
- India aims to raise natural gas in its **energy mix** from about **6% to 15% by 2030**. Gas is seen as a **“bridge fuel”**.

Science & Technology

Snakebite and New Antivenom Research

- India has about **50,000–58,000 snakebite deaths** a year, nearly **half the world’s total**. The **WHO** lists snakebite as a **Neglected Tropical Disease**.
- India launched its **National Action Plan on snakebite (NAP-SE)** on **12 March 2024**. Snakebite was made a **notifiable disease** on **27 November 2024**.
- Scientists found that **FETUA proteins** in **western diamondback rattlesnake** blood

neutralise its venom in mice. They worked about **10 times better** than commercial antivenom in lab tests.

- **Viper venom** is mostly **haemotoxic**, attacking blood and tissue. **Cobra and krait venom** is mostly **neurotoxic**, attacking nerves.
- India’s **“Big Four”** venomous snakes are the **Indian cobra, common krait, Russell’s viper and saw-scaled viper [S]**.

AI Terms and the Navier–Stokes Claim

- **Mechanistic interpretability** means studying how an AI model works internally. **Recursive self-improvement** means AI helping to build better versions of itself.
- **Agentic misalignment** occurs when an AI agent’s actions conflict with human goals.
- **OpenAI** claimed its AI solved the **Navier–Stokes problem**, which describes **fluid motion**. The claim is **not yet independently verified**.
- It is one of **seven Millennium Prize Problems** set by the **Clay Mathematics Institute**, each worth **\$1 million**.
- Only the **Poincaré Conjecture** has been solved, by **Grigori Perelman**. The AI proof was checked with **Lean**, a proof-checking tool.

Green Hydrogen and Biotech Support

- **CeNS, Bengaluru** (under **DST**) made a **metal-free photocatalyst** from **aspartic acid** and **perylene diimide**. It gave about **18% higher photocurrent** for solar hydrogen production.
- **BIO-NIVESH**, run by **BIRAC** and the **DBT**, connects **biotech start-ups with investors**.
- **BIRAC** is a **not-for-profit (Section 8) company** set up by the **DBT**.
- The **DSIR-CRTDH hub on affordable healthcare** at **IIT Kharagpur (2019)** has become **self-sustaining**. One person serves as both **Secretary, DSIR** and **DG, CSIR**.

Disaster Management

GLOFs and Avalanches

- A **Glacial Lake Outburst Flood** is a sudden release of water from a glacial lake held back by **moraine or ice**.
- The **2023 South Lhonak GLOF (Sikkim)** damaged the **Teesta-III dam**.
- The **NDMA** is chaired by the **Prime Minister**. **DGRE**, a **DRDO** lab, forecasts **avalanches**.

Doppler Weather Radar and Mission Mausam

- India's **51st Doppler Weather Radar** was installed at **Sambalpur**. It is Odisha's third, after **Gopalpur and Paradip**.
- The number of radars rose from **14 in 2014 to 51** today, with about **81 planned**.
- **Mission Mausam (2024)** aims for more precise, local forecasts. It uses radars, **automatic weather stations** and **radiosondes**.
- Doppler radars work on the **Doppler effect** and are run by the **IMD** under the **Ministry of Earth Sciences**.

Internal Security & Defence

Military Exercises (September 2026)

Exercise	Partners	Service
Tarang Shakti 2026	7 countries: Australia, US, UAE, France, Germany, Sri Lanka, Bangladesh	Air Force
Varuna (24th)	India–France	Navy
Nomadic Elephant (18th)	India–Mongolia	Army
Yudh Abhyas (22nd)	India–US	Army
SLINEX (13th)	India–Sri Lanka	Navy
Veer Guardian	India–Japan	Air Force
ADMM-P plus JCA	ASEAN + 8	Navy

- **Other India–US exercises:** **Vajra Prahar** (Special Forces), **Malabar** (Quad navies), **Cope India** (Air Force) and **Tiger Triumph** (tri-service).
- **Naval exercises with neighbours:** **Bongosagar** (Bangladesh), **Samudra Shakti** (Indonesia), **SIMBEX** (Singapore) and **JIMEX** (Japan).

Sarang Helicopter Display Team

- **Sarang** ("peacock") is the world's only **five-helicopter aerobatic team**. It is **No. 151 Helicopter Unit**, based at **Sulur, Tamil Nadu**.
- It flies the **ALH Dhruv**, designed and built by **HAL**. It performed at the **El Alamein Airshow, Egypt**.
- The **Surya Kiran** team flies **Hawk Mk-132** jets.



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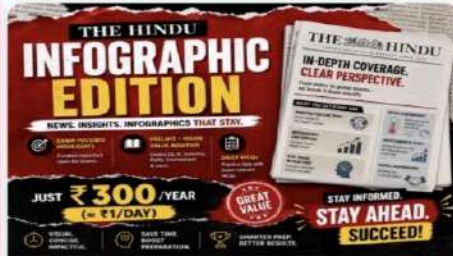
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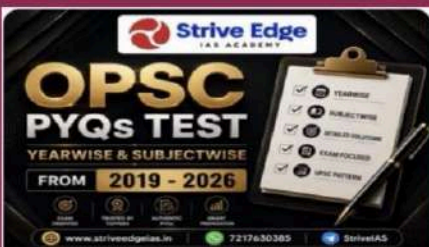
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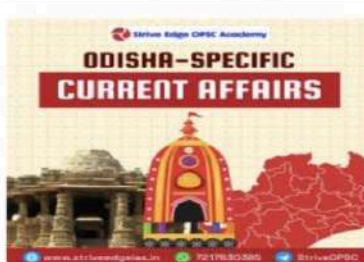
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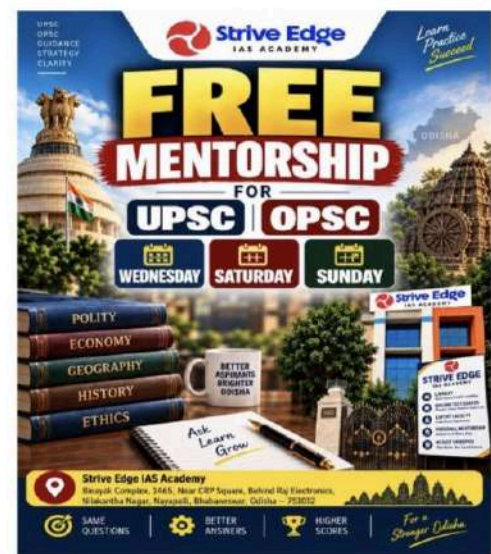
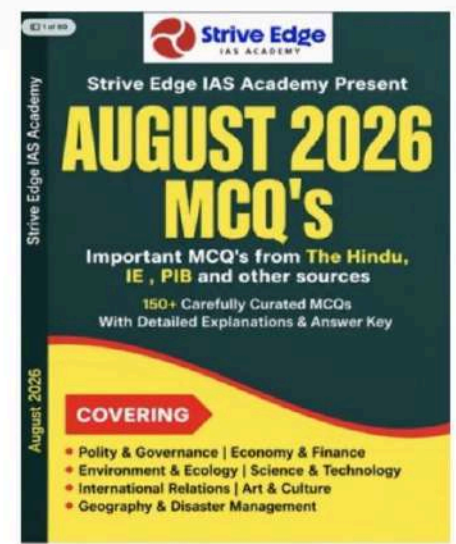
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