CURRENT AFFAIRS

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THE HINDU

The Indian EXPRESS

1. Is India the world's fourth largest economy?
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Mains Daily Analysis

1. Indian summers are getting hotter, but have we lost the ability to adapt?

- **Mains:**
  - **GS Paper I:** Urbanization and associated problems,
  - **GS Paper III:** Disaster management, environmental degradation, climate change, inclusive development

Summary of the Article

The article discusses the **intensifying heatwaves across India**, **questioning whether Indians have lost their traditional ability to adapt to summer heat**. Earlier, Indians lived in mud homes or sandstone structures with natural cooling systems like courtyards, stepwells, shaded verandahs, and adapted their routines accordingly—working at sunrise, pausing during peak heat, and resuming work in the evening.

Now, with urban expansion, **climate change, and disjointed planning, India faces a rising number of heatwave days (a 20% increase from 2010–2022).** Additionally, the lack of standardised, mandatory heat-related mortality data, especially outside formal healthcare setups, underreports deaths caused by extreme heat. **Labourers, informal workers, and rural residents** remain the most affected due to lack of access to cooling infrastructure, healthcare, and awareness.

Efforts to address the crisis remain fragmented. While **urban master plans include resilience measures in theory, in practice, these are poorly implemented**. The article emphasizes the need to re-integrate traditional wisdom, adapt inclusive urban and rural planning, and implement clear protocols for data, early warnings, and local governance coordination.

Analytical Insights for Mains

- Heatwaves are **not just a meteorological issue but a governance and developmental crisis**. Poorly planned urban areas and exclusionary infrastructure amplify heat stress impacts, especially on vulnerable populations.
- Traditional knowledge systems (like **mud architecture, shaded courtyards, and lifestyle rhythms)** provided passive adaptation mechanisms which need revival alongside modern solutions.
- **Lack of granular data on heat-related deaths and morbidity limits** targeted interventions. Public health reporting needs standardisation and transparency.
- **Inclusive and contextual urban planning (e.g., not relying on digital apps alone for warnings) is critical**. Smart cities and rural plans must incorporate local socio-ecological knowledge.
- Empowering Panchayats and local bodies with **clear heat action mandates, budgets, and decision-making authority** is essential to implement resilient micro-level adaptation strategies.

2. Regulating India's Virtual Digital Assets Revolution

Relevance to UPSC:

- **Mains:**
  - **GS Paper II:** Governance – Government policies and interventions,
  - **GS Paper III:** Economy – Mobilization of resources, Challenges of cryptocurrency regulation

Summary of the Article:

- India is a **global leader in crypto adoption**, with significant retail investment and a booming Web3 developer base.
- The **Supreme Court (May 2025**) highlighted a **lack of comprehensive VDA regulation**, warning of the dissonance between policy and on-ground realities.
- **RBI raised early concerns (2013) about crypto's risks to monetary policy**, leading to restrictions and circulars banning VDA-related financial activities, which were later overturned by the courts.

- Current taxation measures, including 1% TDS and 30% capital gains tax, aimed at curbing speculation, have had limited success. Offshore trading dominates due to regulatory loopholes.
- Between July 2022 and October 2024, over **₹3.6 trillion worth of VDAs were traded on non-compliant or offshore platforms,** causing massive revenue losses (~₹60 billion).
- Technical restrictions like **URL blocking have failed**, as users adapt using VPNs, mirror platforms, and non-compliant exchanges.
- **VASPs (Virtual Asset Service Providers) play a key role** and are guided by international bodies **like FATF, IMF, and FSB**. However, Indian regulations lag behind and need harmonization.
- Indian exchanges are improving compliance, especially **post-2024 hack (~$230 million loss), by enhancing cybersecurity,** creating dedicated insurance funds, and uniting for industry-wide standards.
- A **balanced, future-proof legal framework** is necessary to unlock the economic potential of VDAs while safeguarding national interests.

Analytical Insights for Mains:

- India faces a **policy-reality disconnect** due to outdated regulatory frameworks.
- There is a **need to align Indian VDA policy with global standards**, especially FATF recommendations.
- **Tax revenue leakage and capital flight** to offshore exchanges highlight the ineffectiveness of partial regulatory measures.
- A comprehensive VDA legislation must address **user protection, tax compliance, cybersecurity, and ecosystem development.**
- Collaboration with industry players and VASPs can help build a credible and innovative digital asset economy under Indian oversight.

3. Is India the world's fourth largest economy?

Relevance to UPSC:

Mains: GS Paper 3: Indian Economy - Issues relating to growth and development, Inclusive growth, Government budgeting and macroeconomic indicators, Challenges of economic data interpretation

Summary of the Article:

- The article critically examines the claim that **India is the world's fourth-largest economy based on nominal GDP projections for 2025** by the International Monetary Fund (IMF).
- As per IMF estimates, **India's nominal GDP is projected to be $5.42 trillion in 2025**, surpassing Japan's GDP of $5.41 trillion, thus making **India the 4th largest economy in nominal dollar terms.**
- GDP (Gross Domestic Product) is a key economic measure but tells us very little about the **well-being, education, health, or income distribution of the people of a country.**
- **GDP estimates vary depending on the method used:**
  - **Nominal GDP** (based on current exchange rates)
  - **GDP at Purchasing Power Parity (PPP)** (adjusts for cost of living)
- The article argues that **PPP is a more meaningful comparison tool than nominal GDP** as it reflects **relative cost of living and inflation**, especially for developing countries.
- Under the **PPP method, India had already become the third-largest economy in 2008**, surpassing Japan and remaining so till 2025.
- **Limitations of Nominal GDP:**
  - Skewed by **market exchange rate volatility**
  - Fails to account for domestic purchasing power
  - **Undervalues poorer economies due to lower currency values**
- **PPP-adjusted GDP provides a better measure of real economic capacity and citizen welfare**. For instance, India's GDP in PPP terms in 2024 was $15.4 trillion vs just $3.7 trillion for Japan.

- **Per capita GDP remains low for India:**
  - **In nominal terms:** ~$3,650
  - **In PPP terms:** ~$8,300
  - Far below the per capita GDP of developed economies
- The article concludes that while India's economy is growing rapidly, claims of being the fourth-largest economy require careful context. Using nominal GDP alone gives a distorted view, especially when comparing across countries with diverse cost structures and currencies.

Analytical Insights for Mains:

- Economic ranking should not be seen in isolation; qualitative indicators like **health, education, and income equality are crucial.**
- Nominal GDP rankings may be **politically motivated but often mislead public discourse.**
- **India's large population dilutes per capita income**, so macro-level growth does not necessarily translate to higher living standards.
- For meaningful policy-making, **composite indicators and PPP-adjusted metrics** offer better insights into development levels.
- Focus should be on **sustainable and inclusive growth, not just GDP rankings.**

4. A Rain Check for Our Cities

Relevance to UPSC

- **Mains:**
  - **GS Paper 1:** Urbanization, problems, and remedies,
  - **GS Paper 3:** Environment (Disaster Management), Infrastructure (urban planning), Climate Change

Summary of the Article

Urban centres like **Mumbai, Delhi, Kolkata, and Hyderabad** are facing frequent and intense flooding due to a combination of poorly designed drainage systems, urban expansion, and climate change.

Key highlights:

- **Traditional drainage systems were designed for lower rainfall and to carry stormwater to natural drains or water bodies**. However, these systems cannot handle increased runoff due to urbanisation and extreme weather events.
- Volume of runoff depends not just on rainfall, but also on the **nature of land use**. Urbanisation leads to more paved, concretised surfaces, which reduces groundwater recharge and increases surface runoff.
- **Drain design capacity is often based on average rainfall, but now extreme rainfall events**—which previously occurred once in two years—are becoming more frequent.
- **Choked or undersized stormwater drains, encroachments,** and poor maintenance further reduce carrying capacity and contribute to flooding.
- Vertical stacking of multiple drains (i.e., water flowing from smaller drains to main ones) leads to backflow if the main drain is not big enough.
- Many **stormwater drains are mixed with sewage systems**, making it difficult or impossible to clean (desilt) them regularly.
- **Desilting is crucial, but in many cities, it is not done properly or at all due to lack of access or poor management.**
- Cities need dedicated drains for stormwater, with regular maintenance, desilting, and real-time drainage planning using GIS tools.

Analytical Insights for Mains

- Urban floods are no longer just a result of high rainfall but are deeply rooted in inadequate **urban planning, poor infrastructure, and climate vulnerabilities.**
- **Integrated water management, including revival of water bodies, groundwater recharg**e, and scientifically designed drain systems, is essential to reduce flood risk.
- The article underscores the **need for GIS-based simulation tools to dynamically plan drainage** in accordance with changing land use and population.
- It highlights the **need for a separate stormwater network, apart from sewage systems, to ensure efficient drainage**.

5. Strengthening the U.S.-India Subsea Cable Agenda

Relevance to UPSC:

- **Mains:**
  - **GS Paper II:** International Relations – India-U.S. strategic partnership,
  - **GS Paper III:** Science and Technology – Subsea cables, digital infrastructure, cyber resilience, technological sovereignty

Summary of the Article:

- India-U.S. bilateral engagement is intensifying across sectors including **technology, defense, and trade.**
- **Subsea cables are emerging as a strategic area**, carrying over 95% of international data traffic, making them critical for digital services.
- The **TRUST framework is identified as the successor to the U.S.-India iCET initiative** and aims to build resilient digital infrastructure.
- The U.S. and India are exploring cooperation on subsea cables in the **Indo-Pacific via the Digital Silk Road Initiative** to counter China's dominance in this domain.
- India is becoming a **potential connectivity hub, with advantages like a long coastline, strategic location** in the Indo-Pacific, and a growing digital economy.
- However, India's landing stations are concentrated in just five cities (**Mumbai, Chennai, Kochi, Tuticorin, Thiruvananthapuram**), making the system vulnerable to disruptions.
- **Need for redundancy**: A spread-out network is necessary to re-route data during crises like sabotage or natural disasters (e.g. 2024 Houthi attacks on Red Sea cables).
- India sits near key **global maritime choke points, making it ideal as a transit hub for global cable networks.**
- Yet, India's licensing regime is prohibitive – cables need up to 50 clearances from multiple ministries, and reliance on foreign-flagged cable repair ships adds delays.
- **Recommendations include:**
  - Lowering entry barriers for investment
  - Easing regulatory clearances
  - Developing a domestic cable repair ecosystem
  - Encouraging U**.S. firms to invest in Indian cable infrastructure**
- Meta's planned 50,000-km undersea cable project across five continents (highlighted in the India-U.S. Joint Leaders' Statement, 2023) is cited as a major example.
- A **robust U.S.-India subsea cable collaboration also complements broader digital cooperation and trust-based technology alliances.**

Analytical Insights for Mains:

- **Strategic implications:** Subsea cables are not merely digital infrastructure but **tools of geopolitical leverage in the Indo-Pacific.**
- **Economic diplomacy:** India must position itself as a **secure, reliable digital partner to the U.S**. and other democracies.

- **Security concerns: Redundancy and diversification in cable infrastructure** are essential for national security and data sovereignty.
- **Domestic reform imperative:** Without simplifying regulatory hurdles and building indigenous capacity, India's role in the global digital order will remain constrained.

6. How do heatwaves gripping India impact country's labour productivity?

Relevance to UPSC:

Mains:

GS Paper I: Urbanisation, climate change,

GS Paper III: Indian Economy (Employment, productivity), Disaster Management, Environmental challenges, GS Paper II: Government policies and interventions

Summary of the Article:

The article discusses the **increasing frequency and intensity of heatwaves in India and their adverse impact on labour productivity**, especially in the informal sector. In **2024, the International Labour Organization (ILO) reported that over 70% of global workers are at risk of heat exposure**, and India alone lost $100 billion in productivity due to heat stress.

- Monsoon arrived early this year, giving a short respite, but **heatwaves gripped India as early as April,** with some states experiencing soaring temperatures from February.
- **Informal sector workers, small businesses, construction workers, farmers, and delivery personnel** are among the worst affected due to outdoor work and limited access to cooling.
- A recent CEEW report showed that **nearly 76% of India's population lives in 57% of districts highly susceptible to heat risks.**
- The **urban heat island effect worsens the situation in** cities, where urbanisation has led to warmer nights, reduced relief from daytime heat, and increased heat stress-related illnesses.
- Studies show that a **1°C rise in temperature reduces weekly labour productivity by 2%,** severely affecting those with no cooling access.
- Informal workers in Delhi experienced 40% lower earnings on hotter days due to fatigue, sleeplessness, and decreased ability to work.
- **Heat stress has also caused 34 million global job losses**, with India bearing a significant burden.
- **Construction and road-laying jobs** are more heat-prone, especially in summer months with lean work seasons.
- Heat-related distress is compounded by **illness, lower income, and lack of medical access** for low-income groups.

Analytical Insights for Mains:

- **Climate resilience and labour:** The link between climate events and economic productivity is now direct; India must adopt **climate-resilient infrastructure and labour safety nets.**
- **Urban planning and heat management:** Unregulated urbanisation without heat-mitigating planning exacerbates heatwave impacts. Urban policies need to integrate climate adaptation mechanisms.
- **Policy intervention needed:** The article suggests that **governments (central & state) need to urgently enforce climate action plans**, improve working conditions, and protect vulnerable workers.
- **Example:** The **National Disaster Management Authority in collaboration with Ministry of Home Affairs** has issued guidelines for urban heat risk reduction, but enforcement and scale-up remain challenges.
- Public health and productivity are now closely tied to climate policy, necessitating **multi-sectoral governance including labour, urban development, health, and environment ministries.**

7. A Resilience Test

Relevance to UPSC

Mains (GS Paper III): Indian Economy and issues relating to planning, mobilization of resources, growth, development

Summary of the Article

This article explores the causes behind India's recent GDP rebound and emphasizes that sustained growth will require new drivers as older ones fade.

- **India's growth trajectory has seen a swing — from 16.5% to 4.8% to 7.4%** — driven not by deep structural shifts but short-term factors like election-year fiscal impulses and a resurgent agriculture sector due to a strong monsoon.
- **Key growth drivers identified:**
  - Government spending was heavily backloaded—just 2% growth in H1 vs. 15% in H2.
  - Subsidies frontloaded, boosting GDP in Q4.
  - **Agriculture grew from 3% in H1 to 6% in H2,** supported by a favorable monsoon.
- After adjusting for these "exogenous" factors, underlying growth is closer to 6.5%, which is below the full-year GDP growth of 8% (suggesting temporary boost effects).
- Global economic uncertainty—due to **events in the US, trade policies, and a possible US-China trade tension**—adds further complexity to India's outlook.
- Domestic consumption shows signs of weakening in urban areas as **pandemic-driven excess savings, small-firm wages, and unsecured lending fade.**
- While rural consumption is showing promise, there's a **need for corporate investment to step in and sustain recovery,** especially as real estate and public investment impulses fade.
- **The policy recommendation is a pivot to new growth sources:**
  - Seize opportunities from **trade deals (e.g., UK).**
  - Address **uncertainties in the global environment.**
  - Avoid over-reliance on **past growth impulses like monsoons or fiscal pushes.**

Analytical Insights for Mains

- **India's recent growth spike is not purely structural**; it is driven by cyclical and one-off factors, raising questions about sustainability.
- The **transition from consumption-led to investment-led growth is critical**, but private investment still remains weak.
- The article stresses the **need for policy agility, including proactive trade diplomacy** and resilience amid global uncertainties.
- Economic resilience in a post-pandemic world demands **structural reforms and innovation**, not merely riding the tailwinds of temporary booms.

8. Strengthening India's Critical Mineral Supply Chain

Relevance to UPSC:

Mains (GS-3): Infrastructure – Energy, Ports, Roads, Airports, Railways, etc., Science and Technology – Developments and their applications, Environmental Pollution and Degradation, Economic Development and Planning

Summary of the Article:

- India is heavily dependent on imports of critical minerals like **lithium, cobalt, graphite, and rare earths**, especially from China, which poses **economic and geopolitical risks.**
- These minerals are essential for **renewable energy, electric mobility, semiconductors, national defence, and high-tech manufacturing.**
- Despite having reserves, **India lags in domestic exploration, processing infrastructure, and human capital development, resulting in poor value addition.**
- Recent government efforts include the National Critical Mineral Mission, strategic auctions, and international partnerships to secure supply chains.

Analytical Insights for Mains:

1. Why Critical Minerals Matter to India's Growth:

- **Renewable Energy:**
  - Solar and wind capacity expansion relies on minerals like **silicon, tellurium, and rare earths.**
  - **Target: 50% non-fossil fuel power by 2030**; solar capacity already at 64 GW (2024).
- **Electric Vehicles (EVs):**
  - India imports 100% of **lithium and cobalt needed for EV batteries.**
  - China accounts for **70%+ of lithium imports.**
- **Electronics & Semiconductor Sector:**
  - **Gallium, germanium, indium** are vital for chips, displays, and AI hardware.
  - India is part of **Minerals Security Partnership** to reduce Chinese dependence.
- **National Security:**
  - **Titanium, rare earths, nickel crucial** for aerospace, defence electronics.
  - Over **50% titanium still imported.**
- **Economic and Employment Potential:**
  - Mission aims to **train 10,000 workers and initiate 1,200 exploration projects by 2031.**
  - Companies like **Vedanta and Ola Electric** are joining mining auctions.

2. Key Issues in India's Critical Mineral Supply Chain:

- **Import Dependence on China:**
  - India imports **82% lithium, 85.6% bismuth, 76% silicon from China**.
  - Rare earth export curbs by China expose supply vulnerabilities.
- **Inefficiencies in Auctions & Exploration:**
  - Many auctions remain unsuccessful due to **lack of private interest and complex mineral geology.**
- **Underdeveloped Processing Infrastructure:**
  - India's processing capacity is inadequate (e.g., IREL's 600,000 tons/year is insufficient).
  - **China dominates with 87% rare earth and 58% lithium refining.**
- **Environmental and Social Opposition:**
  - Mining projects face delays due to **tribal rights and ecological concerns** (e.g., Rajasthan rare earth blocks).
- **Global Price Volatility:**
  - **Lithium prices fell 75% in 2023, cobalt down two-thirds since 2022.**
  - Unpredictable pricing discourages investment.
- **Tech & Skill Deficits:**
  - India lacks **hydrometallurgical tech for lithium-from-clay extraction (e.g., Reasi in J&K).**
  - Shortage of skilled manpower despite mission goals.
- **Weak Circular Economy:**
  - **Recycling of e-waste and spent batteries** is underdeveloped.
  - China & Europe have export bans on battery scrap, worsening the situation.

Way Forward:

1. Regulatory Reforms:

- **Single-window clearances, flexible auction formats, and digitization** can attract investment.

2. Mineral Processing Parks:

- Integrated mining-processing-manufacturing hubs via PPP and tech transfers.

3. Invest in R&D:

- Develop **eco-friendly extraction technologies and alternative materials.**
- Focus on **India's geology-specific solutions.**

4. **Strategic Stockpiling & Import Diversification:**

- Build strategic mineral reserves and strengthen ties with non-China countries.

5. Skilling and Capacity Building:

- **Use AI/IoT** in training for precision mining.
- Collaborate with global centres of excellence.

6. Recycling Incentives:

- **₹1,500 crore plan to recycle 24 critical minerals.**
- Mandate minimum recycled content in production.

7. Digital Supply Chain Management:

- Use **blockchain and AI for transparency** and efficient inventory management.

9. India's Road to Universal Health Coverage (UHC)

Relevance to UPSC:

Mains:

- **GS Paper II:** Issues relating to health, development of the health sector, government policies and interventions,
- **GS Paper III:** Science & Tech: Digital health ecosystem, Pharmaceutical & medical device industry

Summary of the Article:

India is progressing steadily towards **Universal Health Coverage (UHC) by 2030,** driven by initiatives such as **Ayushman Bharat,** rapid digital transformation, and growing private sector investment. However, nearly 400 million people remain uninsured, and **out-of-pocket expenditure (OOPE) continues to be high**, particularly in outpatient care, which forms two-thirds of total health spending.

Key developments include:

- Strengthening Primary Healthcare via **Ayushman Arogya Mandirs (AAMs**), transforming over 1.7 lakh Health & Wellness Centres, growing at a CAGR of 46.6%.
- **Public Hospital Expansion**: From 7,008 (2005) to 60,621 (2021), with CAGR of 14.4%, improving rural access.
- **Digital Health Revolution:** Tools like **ABDM, CoWIN, e-Sanjeevani, and Aarogya Setu** have expanded reach and transparency.
- **PM-JAY Expansion**: Covers 15 crore families, authorizing 6.5 crore admissions worth ₹81,979 crore so far.
- **Increased Surveillance & Preventive Focus**: Through IDSP and maternal health schemes.
- **Public Healthcare Trust Gains**: Share of government facilities in OPD/IPD rising by 25% since 2014.
- **Pharma and Medical Device Growth**: Pharma sector to reach $130 billion by 2030; new 2023 Medical Device Policy boosts domestic capacity.
- **Healthcare Workforce Rise**: Registered nurses increased from 14.81 lakh (2005) to 36.14 lakh (2022); doctors doubled to 13.08 lakh.

Analytical Insights for Mains:

Key Challenges:

- **Low Public Health Expenditure**: At 2.1% of GDP, below the 2.5% recommendation.
- **High OOPE (39.4%),** mostly on outpatient and medicine costs (drugs = 67% of OOPE).
- **Insufficient Insurance Coverage**, especially for outpatient and chronic care.
- **Workforce Disparity**: Urban-rural imbalance despite improved doctor-population ratio (1:854).
- **Infrastructure Gaps**: Hospital bed density remains 0.5 per 1,000 vs WHO standard of 3.
- **Weak Preventive & Primary Care**: NCDs cause >60% of deaths, but preventive services are underdeveloped.
- **Data Privacy Issues:** Over 1.9 million cyberattacks in 2022, including major hospitals.

Reforms Needed:

- **Strengthen Primary Care**: Fully integrate AAMs with sanitation, nutrition, and education.
- **Build Health Workforce for Rural Areas**: Use incentives, bonds, AYUSH integration, and NHM-based training.
- **Redesign Health Insurance**: Extend PM-JAY to include OPD and preventive services, especially for the vulnerable.
- **Create Unified Regulatory Framework**: Monitor private providers, ensure ethical pricing, and link with digital systems.
- **Enhance Digital Health with Data Security**: Enable interoperable records with AI analytics, while enforcing privacy laws.
- **Promote Innovation in Health Sector**: Encourage R&D, fast-track approvals, and foster self-reliance in pharma and medical devices.

Global Best Practices for India:

- **Brazil:** Community-based primary care through Family Health Strategy.
- **Thailand:** Universal Coverage Scheme for reduced OOPE.
- **Estonia:** Nationwide E-health records for seamless integration.
- **Germany:** Public-private health collaboration with regulated insurance.
- **Finland:** NCD prevention focus via North Karelia Project.

Conclusion:

India's health sector has made notable strides, but **achieving Universal Health Coverage by 2030 demands a shift from reactive to preventive care, stronger public investment, and inclusive digital transformation**. A resilient, equitable, and patient-centric system that integrates public and private sectors will be key to realizing **SDG-3: Good Health and Well-being for all.**

10. Census Set to Trigger NPR Update

Relevance to UPSC

- **Prelims: Census** – Constitutional and legal basis, National Population Register (NPR) – Legal rules, linkage with NRC, National Register of Citizens (NRC) – Legal framework and implications, Citizenship Act, 1955 & its amendments
- **Mains:**
  - **GS Paper 2:** Governance, Government Policies & Interventions,
  - **GS Paper 1:** Population & Demographics

Summary of the Article

- The **next Census will be conducted in two phases across 2026 and 2027**, and will have far-reaching implications beyond population count, such as: **Delimitation of constituencies and Implementation of the Women's Reservation Bill**
- **NPR Update Likely:** The National Population Register (NPR) is likely to be updated during the house listing phase. However, no official decision has been taken yet on conducting a nationwide NRC.
- **Political Sensitivities:**
  - **NPR and NRC** have been politically controversial, especially after the 2019 CAA protests.
  - **10 states and 2 UTs passed resolutions against NPR/NRC in 2020.**
  - Although NPR and NRC were approved in 2019 with a ₹4,000 crore budget, the process was stalled due to the COVID-19 pandemic.

Legal Framework Governing NPR and NRC

- NPR is governed by the **Citizenship (Registration of Citizens and Issue of National Identity Cards) Rules, 2003**, under Section 18 of the Citizenship Act, 1955.

- **NPR is the legal basis for NRC, and the rules lay down a clear process:**
  - **Rule 3(4):** Central Government can order preparation of the Population Register.
  - **Rule 3(5):** The NRC will be created using verified NPR data.
  - **Rule 4(4):** Individuals with "doubtful citizenship" may be flagged during verification.
  - **Rules 7 & 17:** Head of family must provide correct data or face a fine of up to ₹1,000.
- **Historical Timeline:**
  - **NPR was first collected in 2010 and updated in 2015.**
  - NPR revival in 2019 involved digitisation of previous data.
- **NRC Legal Basis:**
  - **Section 14A, inserted in 2003**, empowers the Centre to register every citizen and issue national identity cards.
  - It designates the **Registrar General of India (RGI) as the National Registration Authority.**

Analytical Insights for Mains

- Census 2026–27 could become a tool for **multiple governance reforms—not just in representation (delimitation) but also in gender justice (Women's Reservation Bill).**
- The NPR update may rekindle concerns over NRC, especially in light of unresolved anxieties from the CAA-NRC debate.
- The **legal provisions of the Citizenship Act and 2003 Rules allow for extensive data collection and verification**, but lack of clarity and transparency may lead to public distrust and political opposition.
- Any move toward NRC must balance national security with individual rights and federal consensus, especially given past protests.

11. Reimagining India's Manufacturing Future

Relevance to UPSC:

Mains: GS Paper 3 (Economy): Industrial growth, infrastructure, innovation, R&D

Summary of the Article:

India's manufacturing sector is at a turning point as it a**ims to generate employment, increase productivity, and ensure sustainability.** Rather than following China's manufacturing-heavy model, India must develop a diversified economic framework that combines smart manufacturing with its natural advantage in services and skilled labour.

Key Drivers of Growth:

1. Policy Support and Government Push:
  - Schemes like **PLI and Atmanirbhar Bharat** aim to build capacity in sectors such as **electronics, textiles, and semiconductors.**
  - PLI attracted ₹1.03 lakh crore in investment by Nov 2023; FDI in manufacturing rose 69% from 2014–2024.

2. Demographic Dividend:
  - **India's 900 million working-age population supports labor-intensive sectors.**
  - The gig economy is projected to reach 230 million workers by 2030.

3. Technological Advancements:
  - Industry 4.0 technologies **(AI, IoT**) are improving productivity.
  - Firms like L&T and Siemens are adopting AI-driven production systems.

4. Export Growth and Global Supply Chains:
  - India benefits from the **China+1 strategy.**
  - Apple's production in India hit $14 billion (2023); exports rose to $450 billion (2023-24).

5. Infrastructure Development:
  - The NIP plans to invest $1.4 trillion in infrastructure.
  - **Gujarat leads with 45% of its GDP from manufacturing, supported by logistics and industrial parks.**

6. Rising Domestic Demand:
- India's middle class and consumption boost manufacturing demand.
- **India to become 3rd-largest consumer market by 2026.**

7. Sustainability and Green Manufacturing:
- Focus on **green energy, EVs, and the Green Hydrogen Mission**.
- EV exports expected to touch $1 billion by 2025.

Challenges Hindering Growth:

1. Inadequate Infrastructure:
- India ranks **38th in the Logistics Performance Index (2023).**
- Infrastructure gaps increase manufacturing costs by 20–30%.

2. Regulatory and Bureaucratic Hurdles:
- Despite reforms, delays in clearances and policy uncertainty persist.
- **India ranked 63rd in Ease of Doing Business (2020).**

3. Skill Gap:
- **Only 42.6% of graduates are employable (Graduate Skill Index 2025).**
- Labor productivity lags behind China in key sectors.

4. High Energy Costs:
- Industrial electricity rates at ₹8/kWh in 2025, 10–60% higher than regional peers.

5. Import Dependence and Low R&D:
- Semiconductor imports hit ₹1.71 lakh crore (FY24).
- R&D investment in manufacturing is just 0.64% of GDP.

6. Land Acquisition Issues:
- **LARR Act is slow and bureaucratic**, raising project delays and land costs.
- Even Maharashtra faces land-related delays despite being a top industrial state.

7. Environmental Regulations:
- Stringent norms increase costs, especially for SMEs in sectors like textiles.

8. Global Competition and Low Share in Global Manufacturing:
- India's share is 2.87%, far behind China's 31%.
- Slower adoption of cutting-edge tech weakens competitiveness.

9. External Trade Vulnerabilities:
- **Trade wars and protectionist policies** in global markets limit export growth.
- Export stagnation seen at $450 billion (2023-24).

Measures to Enhance Productivity and Sustainability:

1. Smart Manufacturing and Digital Adoption:
- Promote **AI, IoT, predictive analytics, especially for SMEs.**
- Create tech hubs and PPPs for technology dissemination.

2. Sector-Specific Skill Development:
- Build training institutes aligned with industry needs in **robotics, automation, and green manufacturing.**

3. Regulatory Simplification:
- Adopt a single-window clearance system, streamline labor laws, and expedite approvals for key sectors.

4. Develop Industrial Clusters:
- Focus on **greenfield industrial zones, logistics hubs, and shared utilities for economies of scale.**

5. Promote Green R&D:
- **Offer tax incentives and R&D grants** for sustainable tech.
- Encourage **eco-certification, renewable integration, and waste-to-energy systems.**

6. Implement Circular Economy Strategy:
- **Promote reuse, recycling, and waste minimization.**

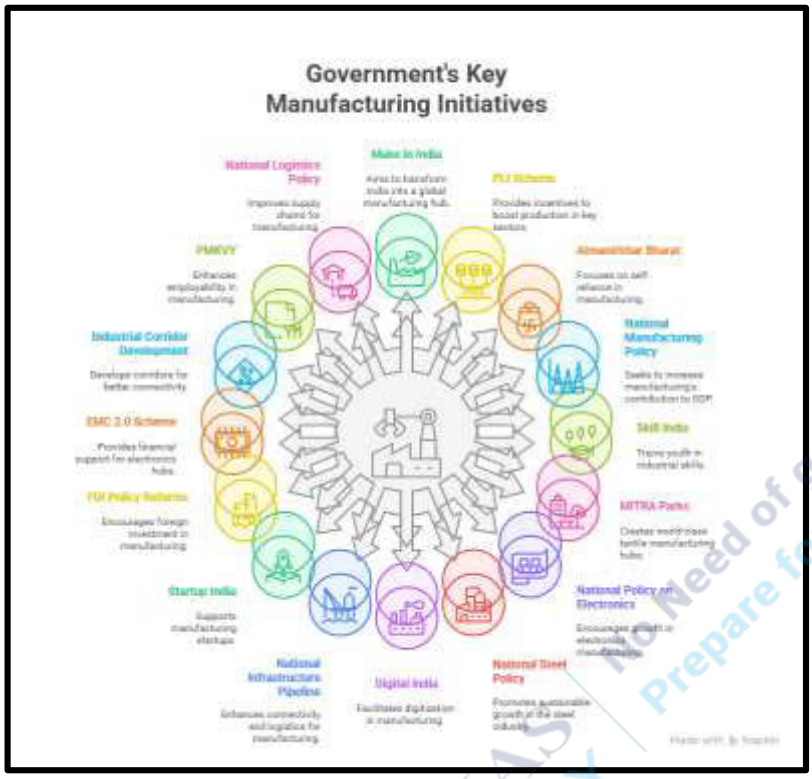
- Support **closed-loop manufacturing and eco-design practices.**

7. Foster Innovation and Startup Ecosystems:

- Incubate startups in **3D printing, robotics, etc**., and connect them with established industries.

8. Enhance Export Competitiveness through FTAs:

- Align manufacturing with global trade agreements, focus on **standards compliance and duty-free access.**



Analytical Insights for Mains:

- India's demographic dividend must be complemented with **skill development to drive labour-intensive manufacturing.**
- A **balanced approach combining green technology, digitization, and policy coherence** is critical to long-term growth.
- India must shift from being an assembly base to an **innovation-driven manufacturing ecosystem.**
- **Integrating Make in India** with global supply chains and sustainable production models can make India a resilient manufacturing hub.

12. Strengthening Judicial Accountability in India

Relevance to UPSC:

Mains: GS Paper II: Polity & Governance – Separation of Powers, Judiciary, Transparency & Accountability

Current Judicial Accountability Mechanisms:

- **Impeachment under Judges (Inquiry) Act, 1968:**
  - Requires support from **100 Lok Sabha or 50 Rajya Sabha MPs**.
  - Investigated by a **three-member committee.**
  - Needs **two-thirds majority in both Houses for removal.**
- **In-house procedure (non-statutory):**
  - Managed by the **Chief Justice of India.**
  - Lacks statutory backing and transparency.
- **Judicial Standards and Accountability Bill (2010, Lapsed):**
  - Proposed a **National Judicial Oversight Committee.**
  - Passed in Lok Sabha but lapsed in Rajya Sabha.
- No **independent statutory body exists to ensure external accountability.**

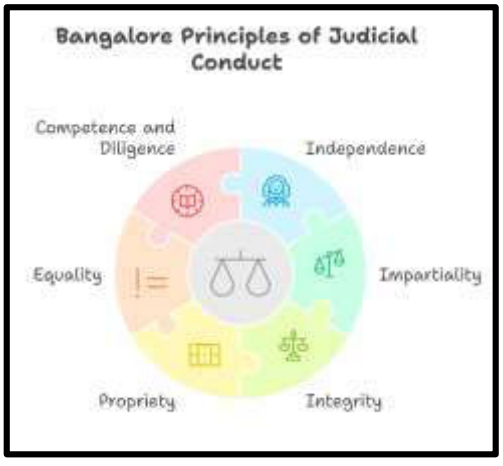
Key Factors for Rising Judicial Accountability Demands:

- Ineffectiveness of existing laws like the **Judges (Inquiry) Act—no judge impeached since 1993.**
- **Judicial independence turning into impunity**, limiting scrutiny and damaging public trust.
- **Opaque collegium system**—no defined eligibility or selection criteria.
- **Lack of external oversight**, with failure to revive lapsed reforms (like 2010 Bill).
- **Judicial overreach in executive matters** raising concerns about checks and balances.
- **Global practices (UK, US)** show stronger models with independent oversight bodies.

Risks in Enforcing Judicial Accountability:

- **Threat to judicial independence**—risk of executive overreach if accountability is politicized.
- **Political interference in impeachment proceedings** (e.g., Justice Ramaswami case).
- **Erosion of public trust** if judiciary is seen as persecuted or retaliatory.
- **Contempt of court** used to suppress criticism, highlighting need for transparent review.
- **No uniform accountability standards**—in-house procedures differ across courts.

Suggested Measures for Robust Judicial Accountability:



1. Independent Judicial Oversight Body:
  - Must include **retired judges, legal experts, and eminent citizens.**
  - Statutorily empowered to investigate misconduct impartially.

2. Reform of Impeachment Process:
  - Introduce **fixed timelines, public disclosure, and accessible complaints.**

3. Annual Public Disclosure of Judicial Assets:
  - Similar to civil servants, judges should declare assets and liabilities.
  - Ensure **third-party verification or media scrutiny.**

4. Transparent In-House Mechanism:
  - Create a reporting system and publicize outcomes to the extent possible.

5. National Judicial Conduct Code:
  - **Codify ethical norms and disciplinary standards for judges.**
  - Enforced by an independent body.

6. Judicial Performance Review:
  - Periodic, transparent review of judgments and ethical conduct.

7. Whistleblower Protection:
  - Safeguards for court employees and others reporting judicial misconduct.

13. Impact of Chinese Dams on Brahmaputra in India

Relevance to UPSC:

Mains:

GS Paper II: India-China relations, bilateral treaties, regional cooperation,

GS Paper III: Disaster Management (floods), Environment and Ecology, Water resource management

Summary of the Article:

Proposed Chinese Interventions on the Brahmaputra:

- Most Chinese projects on the **Brahmaputra are hydropower-based** and located far upstream with minimal water storage, currently posing no significant threat to India.
- The **Medog Hydropower Project (60,000 MW) near the Great Bend** is a potential game-changer, possibly the world's largest, but expected to have limited water storage.
- The **South-North Water Diversion Project (Western Route) is speculative and unconfirmed**, with no official documentation on water diversion from the Yarlung Tsangpo.

Water Yield of the Brahmaputra: India's Dominant Contribution:

- Though India covers only 34.2% of the basin, it contributes over **80% of the river's total water yield.**
- This is due to **high monsoonal rainfall** (avg. 2,371 mm annually) and numerous Indian tributaries.
- Tibet contributes much less due to its low rainfall (~300 mm annually).
- Snowmelt from the Indian Himalayas further adds to the river's volume.

Impact of Upstream Interventions:

- Chinese dams are unlikely to significantly reduce flow due to the **dominance of Indian monsoon-fed tributaries**.
- However, **seasonal variations could impact dry-season hydropower generation.**
- Sudden flooding risks exist from dam failure, **reservoir mismanagement, or seismic activity in Tibet.**
- Changes in flow may impact river morphology, biodiversity, and aquatic ecosystems.

India's Utilisation of Brahmaputra Water:

- The **Brahmaputra and tributaries account for over 30% of India's water resources and 41% of hydropower potential.**
- Development is centered in Arunachal Pradesh, but is hindered by land and environmental concerns.
- Two inter-basin water transfer proposals exist:
  - **Manas-Sankosh-Teesta-Ganga Link**
  - **Jogighopa-Teesta-Farakka Link**
- These are not significantly threatened by China's upstream activities.

Impact of Chinese Dams on the Indus and Sutlej:

- Chinese hydropower projects **on Indus and Sutlej** have limited impact.
- **Bhakra Dam provides a buffer for Sutlej.**
- India's use of Indus is mostly non-consumptive, keeping risks minimal.

India's Strategic Approach:

- Strengthen **scientific monitoring and impact assessment capabilities.**
- Enhance diplomatic engagement to secure hydrological data from China.
- Push for formal data-sharing mechanisms for early warnings and flood management.

Analytical Insights for Mains:

- **India's hydrological self-reliance on the Brahmaputra challenges alarmist narratives**.
- However, risks from uncoordinated upstream interventions, especially in **seismic zones, necessitate proactive disaster management frameworks.**
- India's approach should be technologically robust, diplomatically active, and environmentally conscious.
- The Brahmaputra issue exemplifies the importance of transboundary river cooperation in international relations and climate resilience.

14. Bridging the Gap in Indian Agriculture: Towards Resilient, Tech-Driven, and Inclusive Reforms

Relevance to UPSC

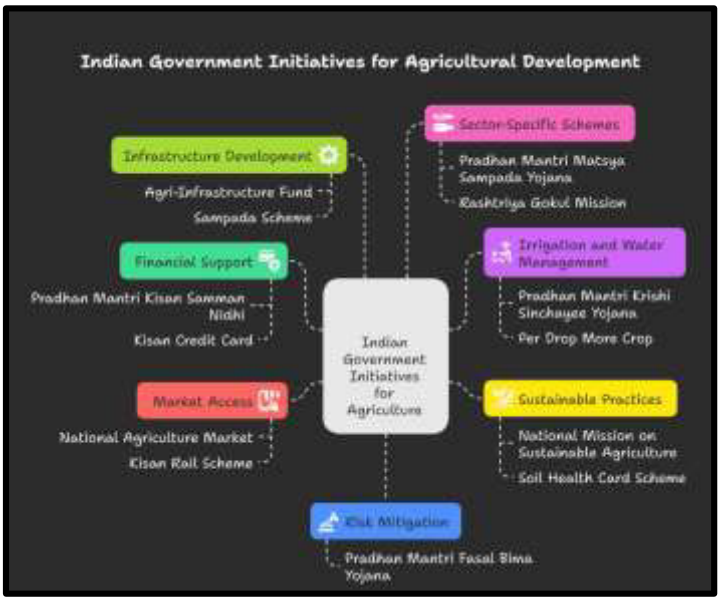
Prelims: Indian agriculture sector, Pradhan Mantri Kisan Samman Nidhi (PM-KISAN), Pradhan Mantri Fasal Bima Yojana (PMFBY), Soil Health Card Scheme, Pradhan Mantri Krishi Sinchai Yojana (PMKSY), e-National Agriculture Market (e-NAM), National Mission on Sustainable Agriculture, Digital Agriculture Mission, National e-Governance Plan in Agriculture (NeGP-A)

Mains:

- **GS Paper 1:** Population & Resources – Rural economy and agricultural systems
- **GS Paper 2:** Government policies and interventions in the agriculture sector
- **GS Paper 3:** Issues related to agriculture, food security, irrigation, technology missions, e-governance, sustainable development

Summary of the Article

- **Top-down vs Ground Reality Disconnect**: Indian agri-policy has focused heavily on **infrastructure-led development**. However, farmers often take decisions based on immediate needs, climate variability, and available local resources. **This gap highlights the need for decentralised, adaptive, and real-time policy responses.**
- **Key Drivers of Agricultural Reform:**
  - **Digital & Technological Advancement**: AI, GIS, remote sensing, and drone tech are facilitating precision farming and boosting productivity.
  - **Climate Resilience & Water Efficiency**: Schemes like "**Per Drop More Crop**" and increased irrigation intensity highlight focus on climate-resilient agriculture.
  - **Diversification:** A shift toward high-value crops and allied sectors (fisheries, livestock) is fueling growth. E.g., fisheries grew at 13.67% CAGR (FY13–23).
  - **Financial Inclusion:** PM-KISAN and KCC have enhanced farmers' access to credit. ₹3.7 lakh crore disbursed under PM-KISAN.
  - **Market Reforms & Digital Access:** Platforms like e-NAM and initiatives like One Nation One Ration Card improve price discovery and market integration.
  - **Organic and Sustainable Farming:** NMSA, millet revolution, and the growing organic market are pushing for long-term sustainability.
- **Persistent Challenges:**
  - Inadequate **water management, especially in rainfed areas.**
  - Climate uncertainty and its adverse effects on crop yields (e.g., rice yield loss up to 15% with 1.5°C temp rise).
  - **Fragmented land holdings – 96% are small or marginal farmers.**
  - Uneven access to **modern technology and weak digital penetration (30% still excluded).**
  - Inefficient policy implementation and narrow MSP coverage.
  - **Soil degradation** – 30% of soils are degraded; limited sustainable practice adoption.
  - **Inadequate post-harvest and storage infrastructure—₹92,000 crore of annual food wastage**.
  - **Credit gap** – 31% of rural loans still sourced informally.



Analytical Insights for Mains

- **From Infrastructure to Intelligence**: Real transformation requires shifting focus from delayed, large-scale infrastructure to real-time, tech-based, and farmer-centric support.
- **Strengthening Ground-Level Capacities**: **Empowering FPOs, improving digital extension services**, and decentralising decision-making are crucial for inclusive reform.
- **Climate-Smart Imperative**: With rising climate risks, precision irrigation, biofortified and resilient crop varieties, and integrated nutrient management must be scaled urgently.
- **Bridging the Policy-Implementation Gap**: Effective reforms demand bottom-up planning, targeted subsidies (e.g., for organic transition), and universalised tech access.
- **Enhancing Market Power**: Digital markets (e-NAM, mobile-based trading) and blockchain for traceability can significantly improve farmer incomes and reduce exploitation.
- **Private Sector & Agri-Tech Collaboration**: Public-private partnerships can improve infrastructure, cold chain logistics, and innovation in agri-startups.
- **Resilient, Responsive Governance:** A flexible, tech-enabled approach with farmer feedback loops will drive sustainability, productivity, and food security in the long run.

15. Reviving Growth Through Monetary Easing: RBI's Policy Pivot

Relevance to UPSC

- **Prelims:** Monetary Policy Committee (MPC), Repo Rate, CRR, Inflation Targeting, Fiscal Deficit
- **Mains:**
  - **GS-3:** Indian Economy – Growth, Resource Mobilization, Monetary Policy, Investment Trends
  - **GS-2:** Role of Statutory Bodies – RBI's role in economic management

Summary of the Article

- **Key Development**: RBI cut repo rate by 50 bps and CRR by 100 bps in June 2025, completing a cumulative 100 bps cut this year.
- **Rationale:**
  - **Inflation at 3.16% (April 2025) is below RBI's tolerance band.**
  - Growth forecast reduced to 6.5% for FY26 despite 7.4% in Q4 FY25.
  - Limited fiscal space due to high deficit (~5.1%) and global uncertainties.
- **Policy Shift:**
  - **Shift from accommodative to neutral stance** suggests near-term pause in rate cuts.
  - RBI now emphasizes **supporting consumption and investment over pure inflation targeting.**
- **Governor's Justification:**
  - Focus on stimulating private demand and investment cycles through lower rates and improved liquidity.

Analytical Insights for Mains

- **For Growth and Investment:**
  - Easier credit to revive **private capex and MSME lending.**
  - Sectoral boost expected in housing, auto, banking, capital goods.
- **For Liquidity and Transmission:**
  - CRR cut **improves banks' lending capacity.**
  - Real challenge lies in ensuring full transmission to end-users, especially SMEs.
- **For Inflation Management:**
  - Despite easing, RBI remains cautious — neutral stance signals flexibility.
  - Risk of reversal exists if external shocks (oil, food prices) emerge.
- **For Fiscal-Monetary Coordination:**
  - With fiscal tools limited, **monetary policy is the front-line lever.**
  - Coordinated reforms (**ease of business, startup support**) needed to sustain growth momentum.
- **Risks and Constraints:**
  - Credit pick-up still slow due to weak private sentiment and high debt overhang.
  - If inflation rebounds, RBI may be forced to recalibrate.

Conclusion

RBI's policy pivot **reflects a strategic recalibration — using monetary tools to support a slowing economy while maintaining inflation discipline**. It underscores the need for a data-sensitive, flexible, and synergistic approach in steering India's growth amid fiscal constraints and global uncertainty.

16. Revamping India's Pharmaceutical Landscape

Relevance to UPSC

Mains:

- **GS Paper 2:** Health sector regulation, Public-Private Partnerships, Government schemes,
- **GS Paper 3:** Indian Economy – Pharmaceuticals, Innovation, R&D, Biotechnology, Environment,
- **Essay/GS Paper 4:** Healthcare access, sustainability, and technological ethics

Summary of the Article

- India's pharmaceutical industry, valued at $50 billion (2024), is projected to reach $130 billion by 2030.
- Despite global trade tensions, **pharma exports remain exempt, emphasizing India's strategic role in global healthcare.**

Current Regulatory Framework:

- **CDSCO (under Ministry of Health):** Regulates drug approval, trials, GMP compliance.
- **Drugs and Cosmetics Act, 1940:** Governs manufacture, sale, and distribution.
- **NPPA:** Regulates prices of essential medicines and ensures affordability.
- **State Drug Authorities**: Enforce drug laws at regional levels.
- **Clinical Trials:** Regulated by CDSCO, guided ethically by ICMR.
- **Advertising**: Controlled by Drugs and Magic Remedies Act, 1954.
- **Recent Reforms**: Include National Medical Devices Policy, 2023 and Pharma Tech Upgradation Scheme.

Key Growth Drivers:

- Low manufacturing cost (30-35% lower than US/EU).
- **PLI Scheme and PMBJP driving expansion and affordability.**
- **Global demand for generics**: India supplies 40% of US generics.
- **Biotech and biologics**: Biosimilars market to hit $12 billion by 2025.
- **Export growth**: $27.82 billion in FY24, reaching over 200 countries.
- **FDI-friendly policies**: Attracted $23.04 billion FDI since 2000.
- **Medical tech & digital health**: Medical tech market to reach $50 billion by 2030.
- **Ayushman Bharat Digital Mission (ABDM) promoting digital transformation.**

Key Challenges:

- **Quality control issues:** Recent WHO alerts raise concerns despite high USFDA compliance.
- **IP and patent disputes**: Especially around compulsory licensing for critical drugs.
- **API dependency**: 70–80% of APIs imported from China, causing supply chain vulnerability.
- **Over-reliance on generics**: Limits innovation and profit margins.
- **Skill gaps**: Especially in biologics, digital transformation, and R&D.
- **Environmental impact**: Poor waste treatment contributing to AMR (Antimicrobial Resistance).

Analytical Insights for Mains

- **Structural Reforms are needed to shift from volume to value** — moving from generics to innovative therapeutics.
- **Self-reliance in APIs is vital for strategic autonomy**, especially in light of geopolitical risks.
- Sustainability must become core to pharmaceutical manufacturing to meet global ESG norms.
- **Skilling and talent development in emerging tech like AI, biosimilars**, and personalized medicine will be essential to maintain competitiveness.
- Digital integration and public-private collaboration can help leapfrog infrastructure bottlenecks.

17. India's Declining Fertility Rate and Its Demographic Implications – UNFPA State of World Population Report 2025

Relevance to UPSC:

Prelims:

- **Syllabus: Indian Society –** Population and associated issues; Health
- **Key areas:** Fertility rate, Demographic dividend, NFHS-5, UNFPA Report 2025, Replacement level, Ageing population

Mains:

- **GS Paper I:** Salient features of Indian Society; Population and associated issues,
- **GS Paper II:** Issues relating to development and management of Social Sector/Services relating to Health, Education,
- **GS Paper III:** Inclusive growth and issues arising from it; Demographic dividend

Summary of the Article:

- **India's fertility rate has declined to 1.9, below the replacement level of 2.1,** as per UNFPA's State of World Population 2025 Report.
- India's population stands at 146.39 crore (April 2025) and is projected to peak at 170 crore in the next 40 years, post which it will decline.
- The **fall in fertility rate is attributed to improved access to reproductive healthcare, women's empowerment, and educational outreach**, not coercive measures.
- NFHS-5 (2022) had already indicated this trend, with urban fertility at 1.6 and rural at 2.1.
- Some states like **Bihar (2.98), Meghalaya (2.9), and Uttar Pradesh (2.35) still show high fertility**.
- **Financial stress is a leading cause of lower fertility:** 38% of Indian respondents cited economic constraints; 21% cited job insecurity.
- There is a **growing gap between ideal and expected number of children**, with 41% considering two as ideal, but many expect fewer due to socio-economic reasons.
- **Family dynamics also play a crucial role: 19**% said their partner preferred fewer children, and 15% cited lack of household support.
- 14% reported pressure from health workers to have fewer children, indicating gaps in reproductive rights.
- **Despite the fertility decline, India's demographic dividend continues, with 68% in the working-age group (15-64 years).**
- However, the **elderly population (currently 7%) is expected to increase**, requiring investments in health, social security, and workforce reforms.
- The real issue, according to UNFPA, is not overpopulation or underpopulation but **unmet fertility intentions and lack of reproductive agency.**
- **The report calls for a shift to rights-based population governance, focusing on:**
  - Workforce participation of women
  - Support for childcare and eldercare
  - Workplace reforms to ease parenting burden
  - Universal access to contraception and fertility counselling
- The **delayed Census 2027 will provide critical data for policy planning.**

Analytical Insights for Mains:

- **The demographic transition offers both opportunities and challenges.** While a falling fertility rate stabilizes population growth, it demands proactive policy adaptations in health, employment, and elderly care.
- The erosion of reproductive rights through **institutional pressures contradicts India's commitment to individual choice in family planning, demanding stronger oversight and rights-based healthcare delivery**.
- **India's demographic dividend is time-bound**, and without strategic investment in human capital, especially skilling youth and integrating women into the economy, it may become a liability.
- The **shift from population control to population governance aligns with global demographic trends and the Sustainable Development Goals (SDGs),** particularly SDG 3 (Good Health), SDG 5 (Gender Equality), and SDG 8 (Decent Work and Economic Growth).

18. India's Path to Inclusive Economic Growth

Relevance to UPSC:

Mains:

- **GS Paper 1:** Poverty, Regional Disparities, Women Issues,
- **GS Paper 2**: Welfare schemes, Rights-based approach, Governance challenges,

- **GS Paper 3:** Inclusive growth, Employment, Infrastructure, Informal sector, Financial inclusion, Sustainable development

Summary of the Article:

India, despite its $3.9 trillion GDP and position as the 4th-largest global economy, faces extreme income inequality and low human development outcomes. **The top 1% controls over 40% of the nation's wealth, while large segments of the population live in deprivation.**

Trajectory of Inclusive Growth:

- **Post-Independence Era (1947–1970s):**
  - Socialist-oriented model, **state-led industrialization, Green Revolution, and land reforms.**
  - **Five-Year Plans**, especially the 11th and 12th, emphasized inclusion.
- **Economic Reforms (1991–2000s):**
  - **Liberalization led to high growth**, but widened inequality and urban-rural divide.
  - Growth boosted FDI, trade, and industrial output.
- **Rights-Based Approach (2005–2015):**
  - **Introduction of MGNREGA, RTE**, focusing on guaranteed employment and education.
  - Implementation challenges remained.
- **Current Era (2015–Present):**
  - **Focus on digital and financial inclusion via PMJDY, Digital India, and Ayushman Bharat.**
  - Renewable energy, Startup India, infrastructure boost broad-based growth.

Analytical Insights for Mains:

Key Issues Hindering Inclusive Growth:

1. Persistent Poverty and Inequality:
  - 1% of population owns 53% of wealth; bottom 50% owns just 4.1%.
  - Welfare schemes like **NFSA** help, but structural inequality persists.

2. Large Informal Workforce:
  - 90% in informal sector, lacking social security, fair wages, healthcare.
  - Need to **formalize employment and improve labor protections.**

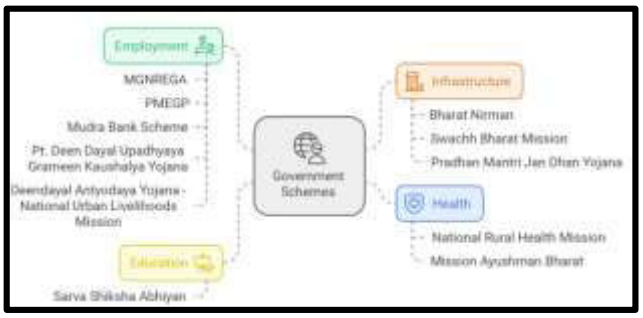
3. Regional Disparities:
  - **Bihar's GSDP is 1/5th of Maharashtra's**, highlighting severe inter-state inequality.
  - Impacts infrastructure and service delivery.

4. Gender Inequality:
  - **Women earn only 18% of men's income**.
  - **India ranks 135th on the Global Gender Gap Index (2022).**

5. Low Financial Literacy:
  - Only 27% financially literate.
  - Hampers access to credit, savings, investment, especially in rural India.

6. Infrastructure Gaps:
  - 25% still lack electricity; poor healthcare and education in rural areas.
  - Initiatives **like PM Saubhagya and Ayushman Bharat** need better reach.

Measures to Promote Inclusive Growth:



1. Expanding Employment via MSMEs and Skill Development:
- **Support MSMEs through credit, tech, infra.**
- Scale up **PMKVY** and vocational training.

2. Strengthening Social Security:
- Extend universal social security to informal workers.
- Use **JAM Trinity (Jan Dhan, Aadhaar, Mobile) for effective DBTs.**

3. Bridging Regional Disparities:
- Focus **infra development in lagging states via Gati Shakti, National Logistics Policy.**

4. Promoting Gender Equity:
- **Ensure equal pay, access to credit**, and safe work environments.
- Encourage women's entry into formal sectors.

5. Digital and Financial Inclusion:
- Expand digital literacy via PMGDISHA.
- **Strengthen credit access via PM MUDRA Yojana.**

6. Public-Private Partnerships (PPPs):
- PPPs in health, education, infrastructure to boost service delivery.

7. Sustainable and Climate-Smart Growth:
- Incentivize green technologies, renewable energy, circular economy.

8. Transparent Governance:
- Promote **accountability through Jan Vishwas Bill, digitized services.**
- Improve public service delivery and reduce corruption.

19. Drone Warfare and India: A New Era of Asymmetric Threats

Relevance to UPSC GS Paper III: Internal Security: Challenges to internal security through communication networks, role of media and social networking sites in internal security challenges, Security challenges and their management in border areas., Role of technology in internal security.

Summary of the Article

- **Low-Cost Drones Have Changed Warfare:** Former Army Chief General M.M. Naravane's warning about low-tech warfare is proven right as Ukraine uses $500 drones to damage Russian airbases and Pakistan deploys drone swarms post-Operation Sindoor
- **Drone Swarms as Strategic Game-Changers:** Drone swarms, powered by AI, are capable of real-time adaptation, coordinated attacks, and saturation strikes. These are cheap but devastating, and difficult to intercept.
- **Massive Market Growth:** The global military drone market is projected to triple from $14.14 billion in 2023 to $47.16 billion by 2032, showing rapid militarization.
- **India's Unique Vulnerabilities:** Porous borders, dense population, and urban clutter make early detection and prevention challenging.
- **Multi-Layered Defence Strategy Required:**
  - **Detection Systems:** AESA radars, infrared & electro-optical sensors, AI-based fusion, acoustic sensors.
  - **Kinetic Kill Options:** Missiles, C-RAM, Phalanx guns, Interceptor drones.
- **Emerging Tech:**
  - **Directed Energy Weapons (DEWs)** like lasers & microwaves.
  - **Electronic Warfare (EW):** Jamming, spoofing.
  - Cyber attacks to hack and crash drones.

- **The Cost Asymmetry Challenge:** A $1,000 drone may require a $1 million missile to intercept — making cost-effective, AI-based solutions essential.

India's Anti-Drone Capabilities

- **Akashteer (Bharat Electronics):** Links with IAF network to provide real-time airspace control.
- **Bhargavastra (Solar Defence):** Launches 64 micro-rockets in rapid bursts to destroy drone swarms.
- **DRDO Anti-Drone System:**
  - **Soft kill:** Jamming GPS and communication.
  - **Hard kill:** Laser targeting.
  - **Detection up to 4 km,** neutralisation within 1 km.
- **Indrajaal (Startup in Hyderabad):**
  - AI-based defensive grid.
  - Secures up to **4,000 sq km**.
  - Used at **naval installations in Gujarat & Karnataka.**

Analytical Insights for Mains

- Drone warfare introduces a **paradigm shift from traditional warfighting to tech-driven, asymmetric conflict.**
- **Cost asymmetry favors attackers;** thus, India needs scalable, AI-integrated, and indigenous defence tech.
- **Coordination between defence, intelligence, and civilian agencies** (e.g., local police spotting drones) is critical for success.
- **India must accelerate R&D in areas like AI, DEWs, and electronic warfare** to stay ahead in this new arms race.

20. Reforming Electoral Practices in India

Relevance to UPSC:

Mains: GS Paper II: Salient features of the Representation of People's Act, issues in electoral reforms, role of ECI, political funding, democratic reforms

Summary of the Article:

India conducts the **world's largest democratic exercise with nearly 97 crore voters, governed by a constitutional and legal framework.** Despite progress, challenges such as criminalisation, money power, voter fraud, and weak regulatory enforcement threaten electoral integrity.

Key Provisions Regulating Elections in India:

- **Article 324:** Empowers ECI to supervise and conduct elections.
- **RPA, 1950:** Deals with electoral rolls and constituencies.
- **RPA, 1951:** Regulates qualifications, disqualifications, and election conduct.
- **Electors Rules, 1960:** Ensures uniform electoral roll management.
- **Delimitation Act, 2002:** Provides for redrawing boundaries based on Census data.
- **Model Code of Conduct (MCC):** Ethical code, not legally binding but partly backed by RPA & BNS.
- **Judicial Oversight**: Supreme Court interpretations bolster electoral integrity.
- **ERONET**: A centralised digital platform to manage electoral rolls and prevent duplication.

Major Issues in the Electoral Process:

- **Limited VVPAT Matching:** Verification restricted to 5 machines per Assembly segment.
- **Electoral Roll Manipulation**: Allegations of duplicate and fake EPIC numbers.
- **Violation of MCC**: Hate speech and communal rhetoric by campaigners go unpunished.

- **Unregulated Party Expenditure**: Parties spent approx ₹1.35 lakh crore in 2024 elections.
- **Criminalisation of Politics**: 46% of MPs elected in 2024 had criminal cases.
- **Digital Misinformation**: Use of deepfakes, fake news, and social media manipulation.
- **Multiple Seats Contestation**: Leads to costly bye-elections and voter fatigue.
- **High Electoral Cost**: EC spent ₹6,931 crore (excluding candidate/party spending).
- **Weak Internal Party Democracy**: Opaque leadership and no term limits.
- **Underrepresentation in FPTP:** Winners often get less than 50% vote share.
- **Delimitation Disparities**: Concerns over bias towards populous states.

Electoral Reforms Needed:

- **Scientific VVPAT Sampling**: Broader verification and mandatory full count on mismatch.
- **Use of Totaliser Machines**: To protect voter anonymity and prevent booth targeting.
- **Aadhaar-EPIC Linking**: For removing duplicate entries with privacy safeguards.
- **MCC Enforcement**: Revoke star campaigner privileges on repeated violations.
- **Cap on Party Spending:** Amend RPA to limit party-level expenditure.
- **One Nation, One Election**: To reduce election frequency and cost.
- **Disclosure of Criminal Records**: Strict ECI monitoring and publicising.
- **Fast-track Political Crime Cases**: Dedicated courts for speedy trial before elections.
- **Restrict Multiple Seats**: Resignation before filing nominations, cost burden on candidates.
- **Constituency Switching Regulation**: Cooling-off period and restrictions on frequent shifting.
- **Internal Party Democracy**: Mandatory elections and term limits within parties.
- **RTI for Political Parties**: To ensure transparency in funding and operations.
- **Voter Education**: Expand SVEEP for fake news and ethical voting awareness.
- **Regulate Digital Campaigning**: Pre-emptive moderation and content tracing.
- **State Funding of Elections:**
  - **Indrajit Gupta Committee**: Recommended partial state funding.
  - **T.S. Krishnamurthy**: Proposed National Election Fund for public financing.

Analytical Insights for Mains:

- Democratic legitimacy depends on **transparent, fair, and representative elections**.
- **Money and muscle power** distort public choice and undermine citizen trust.
- **Criminalisation and misinformation** weaken the foundation of democratic accountability.
- Need for a **multi-pronged approach involving legal, institutional, and technological reforms.**
- Electoral reforms must **balance efficiency, inclusion, and integrity, ensuring true representation.**

21. MSMEs as Pillars of Economic Prosperity

Relevance to UPSC

Mains: GS Paper 3 – Indian Economy - Mobilization of Resources, Inclusive Growth, Infrastructure and Industrial Policy, Government Budgeting and Employment Generation, Role of MSMEs in Economic Development

Summary of the Article

India's Micro, Small and Medium Enterprises (MSME) sector is witnessing robust growth, with increasing credit penetration and government support. MSMEs contribute significantly to employment generation (60% workforce), exports (45.79%), and regional development. Key government initiatives like **PMEGP, Mudra Yojana, CGTMSE, and SFURTI have empowered millions of enterprises.**

Despite this progress, the **sector faces chronic challenges such as limited access to formal credit, compliance burdens, technological gaps, and gender disparities**. Infrastructure deficits and lack of skilled labour also impede productivity.

However, transformative solutions like **digital lending, skill development, e-commerce integration, and green technology adoption** can enhance MSMEs' global competitiveness and sustainability.

Analytical Insights for Mains

How MSMEs Drive Economic Growth:

- **Employment Generation**: Employ 60% of India's workforce; 7.1 lakh jobs via PMEGP in 2023–24.
- **Export Performance:** Contribute 45.79% to total exports; aided by Public Procurement Policy.
- **Financial Inclusion**: ₹5.41 lakh crore disbursed under MUDRA loans in FY24.
- **Digital Adoption**: 72% of MSMEs use digital payments; UPI transactions worth ₹23.48 lakh crore in 2024.
- **Policy Support**: ₹23,168 crore budget allocated (FY26); schemes like PM Vishwakarma aid rural artisans.
- **Regional Inclusivity**: J&K created 3.56 lakh jobs under PMEGP, reducing regional disparities.
- **Sustainability Focus**: Green initiatives under Atmanirbhar Bharat and National Manufacturing Mission.

Key Challenges Faced by MSMEs:

- **Limited Access to Credit**: Only 2.5 crore MSMEs have accessed formal credit out of 6.3 crore.
- **High Compliance Costs**: Tax and labour regulations remain burdensome, especially in manufacturing.
- **Skill Deficit**: 25% cite labour shortage; PMEGP aims to bridge the gap.
- **Tech Lag**: Only 18% use digital lending, 13% use e-commerce/digital marketing.
- **Market Constraints**: Limited global market access despite high export share.
- **Poor Infrastructure**: Logistics cost at 14–18% of GDP, double global average.
- **Gender Disparities**: Women-run enterprises at 26.2%, yet face higher financing barriers.

Reform Measures Suggested:

- **Regulatory Simplification**: One-click compliance, digital clearances, tax ease.
- **Digital Lending Expansion**: More NBFCs, collateral-free loans, wider credit coverage.
- **Skill Development**: Vocational training integrated with Industry 4.0 needs.
- **Digital & E-commerce Push:** Promote online platforms, GeM onboarding, digital literacy.
- **Infrastructure Investment**: Rural logistics hubs, power, CFCs for productivity.
- **Support for Women Entrepreneurs**: Dedicated financial products, mentorship, networking.
- **Green Incentives**: Subsidies for clean-tech, import substitution in green goods.
- **Sector-Specific Finance**: Tailored credit for textiles, defense, food processing.
- **Export Intelligence**: Training, support cells, real-time market data tools.
- **Innovation Boost:** R&D hubs, public-private R&D collaboration, tax incentives.
- **IPR Awareness:** Legal and registration aid for MSMEs, IPR training modules.

22. Reclaiming Reproductive Autonomy in a Changing Demographic Landscape

Mains (GS Paper II & GS Paper I):

GS II: Health, Governance & Policy, Welfare Schemes,
GS I: Population and Related Issues, Social Empowerment, Gender

Summary of the Article:

- **Global Fertility Trends:**
  - **Global fertility rate dropped from 5 (1960) to 2.2 (2024).**
  - Over 50% of countries now have fertility rates below replacement level (2.1).
  - By 2054, all **countries are projected to have fertility rates below 4.**
  - Demographic anxiety is on the rise due to **ageing populations and shrinking workforces.**
- **India's Demographic Shifts:**

- India's TFR declined from 2.9 (2005) to 2.0 (2020) (SRS 2020).
- **Population under age 5 peaked in 2004, and under 15 in 2009.**
- India's population is expected to peak mid-century due to demographic momentum and longer life spans.
- Inter-state fertility differences remain significant.

- **Reproductive Aspirations vs Reality:**
  - **UNFPA–YouGov survey across 14 countries (including India):**
    - 36% Indian respondents had unintended pregnancies.
    - 30% couldn't conceive when desired.
  - This indicates **both overachieved and underachieved fertility.**
  - **Key barriers**: Financial insecurity, unemployment, housing issues, childcare gaps.
  - Indian women face reproductive constraints due to **patriarchal norms and lack of work-life balance policies.**
- **Barriers to Reproductive Autonomy:**
  - **Infertility stigma remains high**; treatment is expensive, unregulated, and private-sector dominated.
  - **Over-reliance on female sterilisation**; need to shift to modern, reversible contraception.
  - **Spacing is neglected**: 4% of married women (15–49 yrs) report unsatisfied need for spacing (NFHS-5).
  - **Son preference and cultural aversion to contraception persist.**
- **Policy & Justice Framework:**
  - Demographic anxiety misplaces blame on women; actual issue is policy failure.
  - **Shift required**: From controlling numbers to enabling choices.
  - Policies must centre on **reproductive agency, not numeric targets.**

Analytical Insights for Mains:

- India must abandon coercive or target-driven family planning approaches and adopt a **rights-based, choice-enhancing model.**
- **Intersectionality matters**: Socio-economic conditions, gender roles, and access disparities must inform reproductive health policies.
- Population discourse should stop **villainizing women's choices and instead enable equitable access to services, information, and financial support.**
- Policymaking must integrate workplace reforms, childcare access, and insurance for infertility treatment to fulfill fertility aspirations.
- India's demographic dividend can only be reaped if **reproductive autonomy is upheld across all social groups.**

23. West Asia Conflict & India's Interests

Relevance to UPSC

Mains: GS Paper II – International Relations India and its neighbourhood & West Asia relations, Bilateral, regional, and global groupings

Summary of the Article

The ongoing Israel-Iran escalation has raised concerns **of regional war, threatening to close the Strait of Hormuz, a vital chokepoint for global oil trade**. This has already led to a 7% surge in oil prices, posing serious economic risks globally, especially for energy-importing countries like India. **India faces multiple challenges—rising oil prices, threats to trade and expatriates, and strategic balancing between rivals Israel and Iran**. The region's sectarian conflicts, proxy wars, nuclear tensions, and rising Chinese influence further complicate India's foreign policy and economic stability.

Analytical Insights for Mains

Key Drivers of Conflict in West Asia

- **Israeli-Palestinian conflict remains the central flashpoint**, worsened by military operations in Gaza and involvement of Hamas and Hezbollah.
- Iran-Israel rivalry intensifies due to **ideological divides and proxy warfare**, exemplified by Iran's missile retaliation in 2024.
- **Sectarian divide**, notably between Saudi Arabia and Iran, fuels proxy wars in Yemen, Syria, and Iraq.
- **Great power rivalry:** U.S. support for Israel vs China's mediation (e.g., 2023 Saudi-Iran peace deal) signals a geopolitical shift.
- **Energy competition**: West Asia's oil reserves are both a resource and a liability, making it a geopolitical hotspot.
- **Economic instability:** High unemployment and inflation (e.g., Lebanon 200%, youth joblessness in Iraq/Saudi 30–35%) contribute to radicalization.
- **Nuclear ambitions:** Iran's uranium enrichment to 60% has triggered fears of a regional arms race.

Implications for India

- **Strategic Dilemma:** India's balanced relations with both Israel and Iran complicate its foreign policy; Chabahar port is especially at risk.
- **Energy security**: India imports 80% of its oil; instability threatens supply and raises costs.
- **Economic impact**: Disrupted trade routes like Red Sea have raised freight costs by 20%, impacting Indian exports.
- **Decline in trade**: Exports to Israel dropped by 63.5% in H1 2024; trade with Iran also declined sharply.
- **Expatriate risk**: Millions of Indians in the Gulf face job and security threats, affecting remittance flows (~3% of GDP).
- **Inflation and slowdown**: A $10 oil price hike = $10 billion CAD increase for India; global slowdown affects India's growth outlook (WB forecast: 2.3% in 2025).
- **China's growing role:** Beijing's deeper West Asia engagement (e.g., BRI, Iran deals) challenges India's strategic presence.

Suggested Measures for India

- **Strengthen diplomacy with both Iran and Israel, and enhance ties with GCC nations.**
- Expand **counterterrorism cooperation with West Asian nations (e.g., Israel, Jordan, Egypt).**
- Diversify energy imports from **Africa, Latin America, and build strategic reserves.**
- Secure maritime trade routes in Strait of Hormuz and Red Sea through naval deployments and multilateral cooperation.
- **Use economic diplomacy:** Promote Chabahar, sign new trade and investment agreements.
- **Leverage soft power**: Promote diaspora ties, education and **cultural exchange for goodwill and regional influence.**
- Boost connectivity projects like **INSTC** to ensure secure trade alternatives.
- **Establish humanitarian engagement**: Provide medical and relief aid to conflict-affected populations to enhance India's global image.

24. Reimagining India's Global Integration – Trade, Finance, and the Road Ahead

Relevance to UPSC

Mains:

GS Paper 3: Indian Economy – Growth, Development, External Sector, Infrastructure,

GS Paper 2: Government Policies and Interventions, Effect of policies of developed countries on Indian interests

Summary of the Article

- India's economic performance has historically improved during periods of strong global integration.
- The **2000–2010 decade saw robust export growth, lower tariffs, and alignment with global growth trends.**
- In contrast, **2010–2020 was marked by protectionism, raised import duties, and reduced export performance**.
- Post-COVID, there's been a surge in financial integration (via capital inflows), but trade integration remains weak.
- **The article presents a sector-wise integration analysis:**
  - **Consumption**: Highly integrated (95% correlation with global growth), but skewed toward the top-income groups.
  - **Investment**: Moderate integration (70%); corporate capex more globalized than household investment.
  - **Exports**: Low integration (35%); labour-intensive mid-tech exports like textiles are underperforming, while high-tech sectors show promise.
- **A two-speed integration model has emerged:**
  - **Financially integrated**: Large firms, professionals.
  - **Trade-disconnected**: MSMEs, low-skilled labour in mid-tech sectors.

Analytical Insights for Mains

1. Why Global Integration Matters:
  - Boosts growth, employment, and competitiveness.
  - Counterbalances domestic demand shocks and deepens market access.

2. Trade–Finance Imbalance:
  - Policy bias toward financial integration has benefited elite firms and investors.
  - Neglect of trade integration has hurt employment-intensive sectors.

3. Mid-Tech Export Revival is Key:
  - Sectors like textiles, furniture, footwear, and electronics can generate jobs, mass consumption, and GDP growth.
  - India risks missing out on supply chain realignments if reforms are delayed.

4. Policy Recommendations:

- **External reforms:**
  - Reduce import tariffs
  - Accelerate FTAs with the EU, UK, and others.
- **Domestic reforms:**
  - Simplify state-level regulations and boost infrastructure, especially logistics and energy.
- **Opportunity Amid Global Shifts:**
  - Potential Trump 2.0 presidency may reconfigure global trade again.
  - India must replicate Vietnam's success in capturing supply chains.

25. Rise of AI and Influencers in India's News Landscape: Insights from 2025 Digital News Report

Mains (GS II & III):

- GS II: Role of Media and Social Networks in Indian Democracy, Governance challenges with misinformation
- GS III: Use of Artificial Intelligence in media, Digital Economy, Ethics in Technology

Summary of the Article

- The **2025 Reuters Digital News Report reveals that generative AI and social media influencers are transforming India's news consumption.**
- India is witnessing a decline in traditional media like print, TV, and standalone news websites, especially among youth (18–34 age group).
- Generative AI tools like **ChatGPT and Perplexity AI** are widely used in India to summarise news, simplify topics, and provide personalised updates.
- **India leads globally in AI adoption for news:**
  - 44% of respondents are comfortable using AI tools.
  - ~20% use chatbots weekly, the highest among surveyed nations.
- These tools offer **interactive, bias-averse summaries**, but also raise concerns about authenticity and editorial responsibility.
- **Social media influencers on YouTube and Instagram are emerging as new, non-traditional news voices, blending journalism, entertainment, and public commentary.**
- Video is the dominant medium now, especially in **India, Thailand, and Kenya.**
  - Indians increasingly consume news via YouTube, particularly explainers, political talk shows, and ideological debates.
- **Among 18–34-year-olds in India:**
  - Only 24% rely on news websites, whereas
  - **41% prefer social media and video platforms.**
- This decline in **trust and engagement with legacy media affects the economics and sustainability of journalism.**
- **Misinformation remains a key concern:**
  - **WhatsApp, despite being a closed platform**, has triggered mob violence due to fake videos.
  - 11% of respondents blame friends and family for spreading fake news, showing a trust deficit in personal networks.
- The future lies in **personalised, AI-driven, video-first, and vernacular content**.
- There is a **need for critical thinking, digital literacy, and regulatory oversight** to ensure journalistic ethics and public trust.

Analytical Insights for Mains

- **Democratisation of News**: AI and influencers are reshaping access to information, making it more inclusive but also fragmented.
- **Challenges to Regulation**: With decentralised information networks, **conventional models of media regulation are becoming obsolete.**
- **Ethics and Integrity**: There is a growing tension between **algorithmic content generation and editorial accountability.**
- **Youth Engagement:** Platforms like YouTube are becoming the primary source of news for the younger population, altering political socialisation and opinion-building.
- **Sustainability of Traditional Journalism**: As revenue declines, traditional media must innovate—possibly integrating AI, short-form content, and influencer partnerships.

26. Clean Technology and India's Economic Development

Relevance to UPSC

- **Prelims:** Clean-tech, National Manufacturing Mission, Green technology, Electric vehicles, India's solar module capacity, National Critical Mineral Mission, Alkaline Seawater Electrolyzer
- **Mains:**
  - **GS Paper II:** Government policies, Industrial policy, Environmental governance

- **GS Paper III:** Environment and Sustainable Development, Infrastructure, Science & Tech (Clean Energy), Employment, and Industrial Growth

Summary of the Article

India is at a pivotal stage to emerge as a global clean-tech hub through strategic initiatives such as the **National Manufacturing Mission,** which emphasizes green technology, and innovations like **Alkaline Seawater Electrolyzer.** Clean-tech can transform India's economy, create employment, reduce import dependency, and enable leadership in sustainable industries.

Key Roles Clean-Tech Can Play in India's Economic Development:

- Job Creation: Estimated 5–6 million jobs by 2030, growing to 9–10 million by 2047 in sectors like EVs, solar, and battery storage.
- **Energy Security**: Domestic manufacturing (solar, battery, wind) reduces reliance on fossil fuel imports**. India's solar module capacity expanded 4x in 2023.**
- **R&D and Innovation:** Growth in green hydrogen, energy storage, and solar R&D, supported by the **Bharat Cleantech Manufacturing Platform and PLI schemes.**
- **Global Supply Chain Hub**: With rising clean-tech exports (5 GW solar modules in 2023), India leverages the "China+1" strategy.
- **Circular Economy**: Recycling of clean-tech products (solar panels, EV batteries) under **National Critical Mineral Mission** to reduce critical mineral dependency.
- **Green Urban Development**: Adoption of green construction, electric mobility, and sustainable cities using **GRIHA and LEED frameworks.**
- **Environmental & Health Benefits**: Reduced air pollution (EVs tackle 30% of transport emissions) improves public health.

Key Challenges in India's Clean-Tech Sector:

- **Import Dependency**: 80% solar components and ~85% batteries still imported; risk worsened by China's rare earth export restrictions.
- **Tech & Innovation Gaps**: Limited domestic capacity in **electrolyzers, high-efficiency solar cells, and green hydrogen.**
- **Infrastructure Deficits**: Grid readiness and energy storage (require 336 GWh by 2030) are bottlenecks despite 209 GW RE capacity.
- **High Capital Requirements**: $12.4 trillion needed for net-zero by 2070; FY24 saw only $2.4 billion in clean-tech investments.
- **Skill Gaps:** 1.2 million workforce shortage in renewable energy; need will rise to 1.7 million by 2027.
- **Waste Management Deficiency**: Projected 600 kt of solar waste by 2030; lacks proper recycling ecosystem.
- **Low Market Demand**: High upfront costs and limited awareness hinder domestic demand for EVs and solar products.

Measures to Accelerate Clean-Tech Development:

- **Public-Private R&D Ecosystems**: Encourage clean-tech innovation through PPPs and tax incentives; promote institutions like IIT-M's seawater electrolyzer.
- **Circular Economy Push**: Mandatory recycling quotas and eco-design regulations for solar, EV, wind sectors.

- **Skill Development**: Sector-specific certifications and vocational programs for solar, battery, and hydrogen workforce.
- **Clean-Tech Financing Mechanism**: Green Banks, sovereign funds, and dedicated clean-tech VC funding to bridge the investment gap.
- **Green Procurement Policies**: Government and corporate mandates for buying clean-tech products to ensure domestic market creation.
- **Tier-2 Innovation Hubs**: Clean-tech incubators and support for startups in smaller cities to broaden industrial base.
- **Global Trade Partnerships**: FTAs and joint ventures in clean-tech with EU, US, Japan to boost market access and tech transfer.
- **Energy Storage & Smart Grids**: Invest in grid-scale batteries, hydro-pumped storage, and AI-enabled energy systems.
- **National Certification System**: Ensure quality assurance and global compliance through clean-tech product certification.
- **Low-Carbon Construction R&D:** Innovate with eco-friendly materials like bamboo, bioplastics, and green cement.

Analytical Insights for Mains

- Clean-tech is central **to India's green growth model, bridging economic, energy, and environmental policy goals.**
- Job-rich sectors like **EVs and solar can absorb India's demographic dividend while reducing urban-rural inequalities.**
- Technological sovereignty is essential to **reduce strategic vulnerabilities in minerals and equipment imports.**
- India's regulatory and financing ecosystem must evolve to attract large-scale investment and ensure equitable distribution of clean-tech benefits.
- Integration of clean-tech into urban planning and industrial policy will shape India's SDG trajectory, especially **Goals 7, 8, 9, 11, and 13.**

27. Implications of West Asian Conflict on India and Key Strategic Responses

Relevance to UPSC

- **Prelims:** West Asian region, Chabahar Port, Belt and Road Initiative (BRI), Organization of Islamic Cooperation (OIC), Non-Aligned Movement (NAM), Red Sea, Strait of Hormuz, Cape of Good Hope, International North-South Transport Corridor (INSTC)
- **Mains:**
  - **GS Paper II:** International Relations – India and its neighborhood, Effect of policies and politics of developed/developing countries on India's interests
  - **GS Paper III:** Energy security, Strategic mineral resources, International trade routes, Maritime security

Summary of the Article

The **escalating West Asian conflict, particularly between Israel and Iran, has created major geopolitical ripples impacting global energy markets, trade routes, and diplomatic alignments.** For India, the implications are multifaceted—ranging from oil price shocks and inflation to strategic dilemmas over balancing ties with both Iran and Israel. Key interests like the Chabahar Port and maritime trade through the Strait of Hormuz are under pressure.

Key Drivers of Conflict in West Asia:

- **Israeli-Palestinian Dispute**: Continued hostilities in Gaza and expanding regional involvement by Hezbollah and Hamas.
- **Iran-Israel Proxy Conflict**: Missile strikes, support to militant groups, and territorial retaliations deepen instability.
- **Sectarian Divide**: Sunni-Shia tensions—Saudi Arabia and Iran backing opposing factions in Yemen, Syria, and Iraq.
- **Geopolitical Rivalries**: U.S. military role vs. China's diplomatic push (Saudi-Iran peace deal 2023) shift regional dynamics.
- **Oil and Resource Competition**: Global stakes in oil-rich zones; Iran's 3.4 million bpd output makes it a critical player.
- **Economic Breakdown**: High inflation and unemployment fueling radicalism (e.g., Lebanon, Iraq, Saudi Arabia).
- **Nuclear Tensions**: Iran's uranium enrichment (60%) and Saudi Arabia's potential counter-nuclear ambitions fuel an arms race.

Implications of West Asian Conflict on India:

- **Diplomatic Dilemma**: India's multi-alignment strategy is tested as it balances strategic partnerships with both Israel and Iran.
- **Energy Security at Risk**: Disruption in West Asian oil exports (India imports >80% of its oil); Strait of Hormuz blockade risk.
- **Shipping Costs and Trade Routes**: Red Sea tensions force detour via **Cape of Good Hope**, raising shipping times and freight by 20%.
- **Trade Disruption**: India's exports to Israel dropped by 63.5% in H1 2024; Iran trade also declining.
- **Threat to Expatriates and Remittances**: Over 8 million Indians in Gulf; rising conflict threatens safety and remittance flows (3% of India's GDP).
- **Rising Inflation**: $10 increase in oil = $10 billion jump in current account deficit; inflationary pressures likely.
- **Geopolitical Realignments:** China's growing West Asia role via BRI and energy deals with Iran shifts power equations; India must safeguard INSTC.

Analytical Insights for Mains

- **India's energy security, trade resilience, and diaspora welfare** are intricately linked with West Asia's stability.
- The conflict tests India's multi-alignment strategy, demanding nuanced diplomacy amid polarized global politics.
- Strategic chokepoints like the **Strait of Hormuz and Red Sea** reveal India's vulnerability in maritime logistics and highlight the need for naval assertiveness.
- The conflict underlines the importance of economic diversification, strategic reserves, and infrastructure diplomacy to ensure national resilience.

Measures India Can Adopt to Safeguard Interests in West Asia:

1. Diplomatic Balancing:
- Strengthen dialogue with **Israel, Iran, and GCC states**.
- Uphold **India's image as a peace-seeking neutral power**.

2. Security and Counterterrorism:
- Intensify intelligence-sharing with **Israel, Jordan, Egypt**.
- Establish joint security platforms to monitor regional threats.

3. Energy Diversification:
- Source **oil from Africa, Central Asia, Latin America.**

- Expand **Strategic Petroleum Reserves (SPR)** to absorb shocks.

4. Maritime Security:
- Enhance Indian Navy's presence in the Persian Gulf and Red Sea.
- Collaborate with global powers to secure sea lanes.

5. Economic Diplomacy:
- Push infrastructure projects like **Chabahar Port and INSTC.**
- Strengthen trade and investment partnerships with Gulf and Central Asia.

6. People-to-People Ties and Soft Power:
- Promote **Indian culture, education, healthcare expertise.**
- Build goodwill with regional societies to secure diaspora interests.

7. Connectivity and Regional Integration:
- Fast-track INSTC and alternative supply corridors to avoid chokepoints.
- Use infrastructure as a stabilizing tool for regional cooperation.

8. Humanitarian Engagement:
- Develop rapid response units for evacuations and aid.
- Coordinate with UN agencies for refugee and post-conflict support.

Conclusion:

West Asia's escalating conflicts pose serious threats to India's energy security, trade, and diaspora. **A proactive, multi-pronged strategy—balancing diplomacy, economic resilience, and maritime security—is essential**. By leveraging soft power and regional integration efforts, India can emerge not only as a strategic balancer but also as a constructive force for regional peace and stability.

28. India's Road to Gender Parity

Relevance to UPSC:

Mains (GS Paper II and GS Paper III):

GS II: Welfare schemes, Role of women in governance, Gender issues.

GS III: Inclusive growth, Employment, Women entrepreneurship, Skill development.

Summary of the Article:

India has made notable strides in its journey toward gender parity, particularly in education, financial inclusion, and grassroots political empowerment. However, challenges persist **in labor force participation, political representation at higher levels, and economic empowerment.**

Key Achievements:

- **Education:**
  - **Female Gross Enrolment Ratio at elementary (94.32%) and secondary (81.32%) levels exceeds that of boys.**
  - Female literacy increased from 9% in 1947 to 77% in 2025.
- **Financial Inclusion:**
  - **56% of PMJDY accounts held by women.**
  - DBT and schemes like **Ladli Behna Yojana** empower rural women with direct access to subsidies.
- **Legal Reforms:**
  - **Criminal Law (Amendment) Act, 2013:** Stronger laws on sexual harassment.
  - **26 weeks of paid maternity leave (since 2017).**

- **Leadership & Representation:**
  - Women heading CRPF sectors, **judiciary (Justice Nagarathna), military (Col. Sofiya),** and corporate boards (97% NSE firms with at least one woman director).
  - **Women's Reservation Act 2023**: Reserves 1/3rd of seats in Parliament & Assemblies (effective 2029).
- **Health Improvements:**
  - **Maternal Mortality Rate reduced by 50%**, increased access via Ayushman Bharat (49% women beneficiaries).
- **Rural Workforce Participation:**
  - **57.47% of MGNREGA workers are women**, earning independent income.
- **Entrepreneurship:**
  - **68% of Stand Up India loans go to women.**
  - SHGs play a key role in financial literacy and micro-entrepreneurship.

Analytical Insights for Mains:

Challenges Hindering Gender Parity:

- **Political Underrepresentation:**
  - Only **13.8% in Parliament**, 5.6% in ministerial roles.
  - Delayed implementation of Women's Reservation Act until 2029.
- **Low Labor Force Participation:**
  - **Women's LFPR ~41.7%,** often in informal sector with wage gaps and no social security.
  - ₹19 lakh crore worth of unpaid work (Oxfam India).
- **Cultural & Patriarchal Barriers:**
  - 59% women do not take financial decisions independently.
  - **Gender norms affect career choices, mobility, and leadership roles.**
- **Gender Pay Gap:**
  - Urban women earn 30-40% less than men for similar jobs.
- **Education-Employment Disconnect:**
  - Only 27% of STEM jobs held by women despite high female STEM graduation.
- **Inadequate Childcare:**
  - 73% of Indian women leave jobs after childbirth due to poor support infrastructure.
- **Inactive Bank Accounts:**
  - 32% of women's PMJDY accounts remain inactive.

Measures Suggested:

- **Skill Development**: Focus on digital, green, and non-traditional sectors, especially in rural areas.
- **Stronger Labor Laws**: Enforce equal pay, maternity benefits, workplace safety, and childcare support.
- **Leadership Mentorship Programs**: Train women in governance, public administration, especially from Panchayati Raj level upward.
- **Gender-Responsive Budgeting**: Institutionalize gender impact assessments and targeted fund allocation.
- **Support for Women Entrepreneurs**: Create a dedicated financial ecosystem, relaxed collateral norms, and a national women entrepreneurs' registry.
- **Gender-Sensitive Education**: Curriculum reform to challenge stereotypes, encourage girls in STEM, boys in caregiving.
- **Robust Data & Monitoring**: Gender-disaggregated data collection for evidence-based policymaking.
- **Protection for Informal Workers**: Unions, fair wages, social security for domestic and informal sector women workers.
- **Gender Impact Bonds (GIBs):** Attract private capital for outcomes-based women-centric projects.

Conclusion:

"Gender equality is not a women's issue, it's a human issue. It affects us all."

India's journey to gender parity has seen remarkable progress, but to achieve true equality, it must address deep-rooted cultural norms, ensure equal economic opportunities, and implement targeted, inclusive policies. The road ahead **calls for systemic reforms, social awareness, and active involvement** of both genders to build an equitable future.

29. The Real Challenges of Foreign Campuses in India

Relevance to UPSC:

Mains: GS Paper 2: Issues relating to education sector, Government policies and interventions,
GS Paper 2/3: Role of international institutions, public trust in education, regulation of private players

Summary of the Article:

The UGC (2023) regulations have allowed foreign universities to set up campuses in India, such as **Deakin University and University of Wollongong in GIFT City, and University of Southampton in Gurugram**. This move aims to internationalise Indian higher education, offer **global-quality education domestically, and introduce global pedagogical practices.**

However, early implementation shows **signs of haste and lack of preparedness, with some institutions beginning admissions without curriculum or faculty details**. Many of these foreign institutions are not top-tier in their home countries and often focus on market-oriented disciplines already well-served in India.

Concerns include:

- Overreliance on **marketing without academic depth**
- Lack of physical campus identity
- Narrow academic offerings
- Potential to be seen as 'diploma mills'
- Risk of undermining trust in internationalisation

The article stresses that unless quality, transparency, and contextual relevance are prioritised, this policy could become counterproductive.

Analytical Insights for Mains:

1. Opportunities:

- Enhanced academic quality through **global curricula and teaching standards**
- Reduced **outflow of Indian students seeking education abroad**
- Healthy competition for Indian private universities to improve quality

2. Core Challenges:

- Lack of regulatory oversight over curriculum, faculty, and infrastructure
- **Foreign universities focusing on revenue rather than research and local needs**
- Absence of long-term commitment to the Indian education ecosystem
- Reputational risks if quality is compromised in the name of globalisation

3. Strategic Way Forward:

- Adopt a **criteria-driven approval system** focusing on **faculty quality, academic vision, and research potential**
- Ensure alignment with **local socio-economic goals and national educational priorities**
- **Avoid over-incentivisation**; instead, focus on developing a robust academic-regulatory ecosystem
- Encourage development of full-fledged campuses with libraries, extracurricular spaces, and research labs to build an academic community, not just a learning space

30. Building a Credible Carbon Market in India

Relevance to UPSC:

Mains: GS Paper 3: Environment: Conservation, Environmental Pollution and Degradation, Environmental Impact Assessment, Economic Development: Infrastructure – Energy; Industrial Policy; Investment Models, Science & Technology: Indigenization of Technology and Developing New Technology

Summary of the Article:

India's Carbon Credit Trading Scheme (CCTS), launched in 2023 and operational by 2026, is **aimed at helping the country meet its climate commitments under the Paris Agreement, notably a 45% reduction in emission intensity by 2030 and net-zero emissions by 2070.** The scheme is designed to be a market-based tool to cap and reduce emissions, incentivize clean technology, and allow trading of surplus carbon credits.

Key growth drivers include:

- **India's international climate obligations**
- Pressures from global mechanisms like the **EU's Carbon Border Adjustment Mechanism (CBAM)**
- Promotion of **cleaner technologies and green investments**
- Financial opportunities for industries through **carbon credit trading**
- **Sector-specific accountability**, especially in energy-intensive sectors
- **Rising stakeholder engagement**, both domestic and international

Analytical Insights for Mains:

Key Challenges Identified:

- **Limited scope**: Major emitters like steel and thermal power are excluded
- **Weak emission targets for included sectors** (e.g., only 3.4% for cement over two years)
- MSME exclusion due to **high compliance costs and lack of financial/technical support**
- **Poor MRV (Monitoring, Reporting, Verification) systems**, affecting credibility
- Fragmentation with **existing schemes like PAT (Perform, Achieve, Trade)**
- Risk of market dilution from voluntary offsets and double counting
- **Unstable carbon pricing**, deterring long-term investment
- **Lack of direct sectoral incentives** for adopting green tech

Way Forward / Recommendations:

- Promote green finance (**green bonds, tax incentives, international partnerships**)
- **Set long-term, sector-wise decarbonization roadmaps**
- Digitize and **strengthen MRV systems using AI and blockchain**
- **Build capacity and awareness**, especially for MSMEs
- Introduce **market stabilization mechanisms like price floors and carbon banks**
- Include all **major emitting sectors under the CCTS ambit**
- Enable **cross-border carbon trading** for competitiveness and liquidity
- Incentivize **carbon capture and utilization (CCU) technologies**
- Develop a credible offset framework with strong certification and transparency

31. Building India's Ecological Resilience

Relevance to UPSC:

Mains (GS Paper 3): Conservation, environmental pollution and degradation, environmental impact assessment, Disaster management, sustainable development, climate change and mitigation strategies

Summary of the Article:

India's revised Green India Mission **marks a shift from plantation-driven afforestation to landscape-level ecological restoration in fragile regions like the Western Ghats, Himalayas, and Aravallis**. These biodiversity hotspots are increasingly under threat from deforestation, illegal mining, urban expansion, and climate-induced disasters. The mission seeks to balance ecological security with the livelihoods of local communities, a challenge that previous conservation efforts have often failed to address.

The article outlines key mechanisms of environmental governance, including:

- **MoEFCC**, as the central policymaking body
- **NGT for environmental litigation**
- **CPCB and SPCBs** for pollution control
- EIA process for project approvals
- **Forest Advisory Committee under Forest Conservation Act**
- Wildlife Protection Act and NBWL for habitat protection
- Climate change response through **NAPCC, SAPCC, and NAFCC**

It highlights India's major environmental challenges such as:

- Air pollution, with **Delhi topping global PM2.5 levels**
- Water scarcity and contamination, affecting over 600 million people
- **Rapid deforestation**, with a loss of 1.49 million hectares of forest between 2013–2023
- **Climate change-induced disasters, like floods and heatwaves**
- **Waste mismanagement**, especially in plastic and e-waste
- **Human-wildlife conflicts**, with over 6,000 human deaths due to elephant attacks
- Soil degradation, threatening 60% of India's arable land
- **Invasive species, disrupting native ecosystems**

Analytical Insights for Mains:

1. Strengthening Environmental Governance:

- Repeal or review diluting amendments like the **Forest Conservation Amendment Act 2023**
- Ensure effective enforcement by **MoEFCC, CPCB, and SPCBs**
- Enhance **transparency and accountability** in decision-making

2. Transition to Sustainable Economic Practices:

- **Promote circular economy**, especially for plastic and e-waste
- Encourage **organic and agroforestry-based farming** to curb soil degradation

3. Climate Adaptation and Disaster Preparedness:

- **Integrate climate risk assessments in national planning**
- Promote nature-based solutions like **watershed management, urban green spaces, and native reforestation**

4. Participatory Conservation Models:

- Empower local communities through **decentralized water and forest governance**
- **Promote eco-tourism** to align livelihoods with conservation goals

5. Restoring Ecological Balance:

- Prioritize **natural forest restoration over monoculture plantations**
- Establish and protect wildlife corridors to mitigate human-animal conflict

32. Food Processing Sector in India – Ensuring Inclusive Growth and Global Integration

Relevance to UPSC:

Mains (GS Paper 2 & 3): GS2: Government schemes, Inclusive growth, Governance, GS3: Agriculture, Food processing industry, Infrastructure, Employment, MSMEs, Innovation

Summary of the Article:

- Over the past 11 years, **India's food processing sector has witnessed transformative growth, supported by government policies, infrastructure, and innovation.**
- Schemes like **PMFME, PMKSY, and PLI** have led to formalisation of **micro-enterprises, employment generation, and agri-value chain enhancement.**
- A grassroots food revolution is underway, with micro-entrepreneurs like **Gyanish Kumar Mishra** exporting flavoured **Makhana globally — a success story supported by PMFME.**
- There's a structural transformation linking rural entrepreneurship with national and global value chains.

Key Government Schemes and Achievements:

PMKSY:

- **250 LMT annual processing capacity created**
- Attracted ₹22,000 crore private investment
- Benefitted 53 lakh farmers and generated 7.6 lakh jobs

PMFME:

- ₹10,000 crore outlay under **Atmanirbhar Bharat**
- 1.41 lakh loans (~₹11,205 crore) sanctioned
- 3.3 lakh SHG members supported with seed capital

PLI Scheme:

- ₹8,900 crore committed investments
- 3.3 lakh jobs created
- 67 LMT processing capacity added

Infrastructure and Quality Control Initiatives:

- **Union Budget 2024–25 proposed:**
  - 50 irradiation units to reduce post-harvest losses
  - 100 NABL-accredited food labs to improve quality
  - A **dedicated National Makhana Board** for branding and value addition
- **Innovation and Research:**
  - **NIFTEM-Kundli, NIFTEM-Thanjavur**, and upcoming NIFTEM-Bihar driving food-tech research
  - Over 5,000 startups working on AI traceability, plant-based products, sustainable packaging, etc.
- **Global Integration**:
  - World Food India is emerging as a global investment and collaboration hub in food processing
  - It projects India as a key player in the global food economy
- **Grassroots Transformation Examples:**
  - A **tribal kitchen in Bastar, under PMFME, has commercialised Mahua-based products** (chocolates, teas, energy bars) – preserving tradition while scaling business.

Analytical Insights for Mains:

- **Inclusive Growth**: Food processing empowers rural entrepreneurs, integrates SHGs, and strengthens women's participation.
- **Value Addition**: Encourages transition from raw commodity sale to processed goods, increasing farmer incomes.

- **Innovation Ecosystem**: Establishment of **NIFTEMs and food-tech startups fosters R&D**, making India a food-tech hub.
- **Export Potential**: Branding indigenous products like **Makhana and Mahua opens up niche global markets.**
- **Challenges:** Need for sustained cold chain infrastructure, access to markets, and compliance with international quality standards.

33. Growth-Employment Disconnect in India

Relevance to UPSC

Mains GS Paper III: Indian Economy – Growth, Employment, Inclusive Development, Skill Development, Infrastructure

Summary of the Article

Despite India's inflation falling to 2.8% in May 2025, unemployment rose to 5.8%, revealing a disconnect between economic growth and employment generation. While the agricultural sector performed well, the growth was not job-generative in other key sectors. To address this growth-employment paradox, India must adopt policies that embed job creation into the core of economic planning.

Key Strides in Curbing Unemployment

- **Skill Development Initiatives:**
  - Skill India and **Pradhan Mantri Kaushal Vikas Yojana (PMKVY)** have trained 13.7 million candidates, enhancing employability.
  - However, only 18% of those trained were placed, indicating room for improvement.
- **Make in India & PLI Scheme:**
  - **Boosted domestic manufacturing and foreign investment**, increasing manufacturing employment from 57 million (2017-18) to 62.4 million (2019-20).
- **Digital Literacy Expansion:**
  - **Digital India and PMGDISHA** aim to digitally empower 60 million rural citizens, expanding access to online job markets.
- **Public-Private Partnerships (PPP):**
  - Projects like the **National Infrastructure Pipeline** (Rs. 111 lakh crore) are designed to stimulate employment across sectors.
- **Youth-Specific Job Schemes:**
  - Union Budget 2024-25 allocated Rs. 2 lakh crore over 5 years for youth employment and first-time employee incentives.
- **Labor Market Reforms:**
  - **Introduction of Labor Codes (Wages, IR, Social Security**) to improve formalization and job security in the informal sector.

Factors Contributing to the Disconnect

- **Capital-Intensive Growth Model:**
  - Between 2014–2023, capital stock rose 74%, but employment only by 36%, leading to a rising capital-labor ratio.
- **Informal Workforce Expansion:**
  - Over 80–90% of India's workforce remains in the informal sector, often in low-quality, insecure jobs.
  - 57.3% self-employed, and 18.3% unpaid family workers as per Economic Survey 2023–24.
- **Skill Mismatch:**
  - Despite PMKVY's outreach, **a skills-job mismatch persists; only 2.4 million out of 13.7 million trained were placed.**
- **Sluggish Manufacturing Growth:**

  - Though employment rose, manufacturing is not expanding fast enough to absorb surplus labor, especially from agriculture.
  - MSE sector faces 25–30% failure rate within 5 years due to inadequate support.
- **Agricultural Overdependence:**
  - 45.76% of workforce still depends on seasonal, low-productivity agriculture, limiting employment quality.
- **Preference for Government Jobs:**
  - Strong socio-cultural preference for secure government jobs reduces private sector labor participation.

Analytical Insights for Mains

- **Fostering Labor-Intensive Manufacturing:** Prioritize sectors like textiles, apparel, food processing; strengthen MSEs/SMEs through tax breaks, subsidies, and credit access.
- **Promoting Rural Entrepreneurship**: Enable credit, infrastructure, and training to create local job ecosystems and curb rural-urban migration.
- **PPP in Education-Skills Alignment**: Industry-aligned curricula and joint vocational training can address employability gaps, especially in AI, automation, data sciences.
- **Green Job Creation**: Invest in renewable energy, EVs, waste-to-energy to create sustainable employment while addressing climate goals.
- **Sector-Specific Employment Policies**: Frame customized hiring and training incentives for healthcare, technology, construction, etc.
- **Speedy Labor Code Implementation**: Ensure inclusivity, provide gig workers and contractual labor with social security and legal rights.
- **Public Infrastructure Push:** Invest in transport, healthcare, logistics to create direct and indirect jobs and improve business productivity.
- **Facilitate Transition from Agriculture**: Provide targeted skilling, promote agro-processing, and rural SMEs to shift workers to higher productivity sectors.
- **Tax Incentives for Job-Creating Enterprises**: Encourage firms to hire more by offering tax relief, subsidized loans, and job-linked grants.

34. The Sorry State of South Asian Economic Integration

Relevance to UPSC

Mains: GS Paper 2 – Regional groupings, India's neighbourhood policy

Summary of the Article

- **South Asia remains one of the least economically integrated regions** despite housing nearly 25% of the world's population.
- **Economic and security domains, though interlinked, are addressed in isolation by South Asian countries.**
- Intraregional trade under SAFTA is only 5–7%, far below EU's 45%, ASEAN's 22%, and NAFTA's 25%.
- UNESCAP estimates SAARC's trade potential at $67–172 billion, while current trade is only about $23 billion.
- Countries like **Bangladesh (93%), Maldives (88%), and Pakistan (86%)** have high untapped trade potential within the region.
- **India-Pakistan trade has drastically declined**, with Pakistani exports to India dropping from $547.5 million in 2019 to just $480,000 in 2024.
- Trade-to-GDP ratio has fallen from 47.3% (2022) to 42.94% (2024), and trade deficit has grown to $339 billion.
- **Regional trade costs are extremely high (114%)**, even higher than trade with the US (109%), and Indian firms face 20% higher costs trading with Pakistan than Brazil.
- Structural issues such as **terrorism, insurgencies, historical animosities, and political mistrust** have paralysed SAARC and undermined regional cooperation.

- ASEAN's success contrasts South Asia, where lower trade costs and strategic value chains enable integration.
- **Lack of trust has blocked integration not only in goods but also in services and investments, stifling job creation, innovation, and FDI.**

Analytical Insights for Mains

1. Causes of Poor Economic Integration

- **Historical and political mistrust**, especially between India and Pakistan.
- **Inefficient trade logistics, high tariffs, and poor customs infrastructure**.
- Underperforming regional institutions like **SAARC**, which lack enforcement mechanisms.
- Absence of regional value chains, unlike in East Asia and ASEAN.

2. Impact on Regional Development and Security

- **High trade costs discourage economic interdependence.**
- **Economic stagnation fosters internal unrest**, which in turn deters infrastructure and investment.
- Lost opportunities in trade and employment, especially for small economies in the region.
- Failure to integrate hampers collaborative response to shared challenges (e.g., climate change, pandemics, terrorism).

3. Way Forward

- Lower trade barriers, **reduce NTBs (Non-Tariff Barriers), and enhance customs/logistics.**
- **Prioritise diplomatic trust-building, especially between rival states.**
- Revive SAARC with enforceable commitments, and align it with modern economic frameworks.
- Encourage **sectoral cooperation (e.g., digital trade, energy grids, education exchange).**
- Promote economic interdependence as a peace-building strategy.

35. Promoting Public-Private Synergy in India's Space Sector

Relevance to UPSC:

Mains (GS Paper III): Science and Technology - Developments and their applications, Indigenization of technology and development of new technology

Summary of the Article:

India's space sector is undergoing a transformative shift with growing private sector involvement complementing the efforts of ISRO. The government has enabled this synergy through initiatives like the Indian National Space Promotion and Authorization Center (IN-SPACe) and increased collaboration with private startups and industry players.

Key developments include:

- ISRO's outsourcing of launch vehicle manufacturing to HAL, allowing ISRO to focus on advanced technologies like reusable launch vehicles (RLVs) and orbital security.
- The **rise of startups such as Skyroot Aerospace (launched Vikram-S), Agnikul Cosmos (developed Dhanush mobile launchpad), and Pixxel.**
- Establishment of space parks and Small Satellite Launch Vehicles (SSLVs) for affordable, on-demand services.
- Public-**private partnerships in manufacturing with entities like HAL, L&T, and Godrej Aerospace.**

Analytical Insights for Mains:

How is the Private Sector Contributing?

- **IN-SPACe:** Acts as a single-window facilitator for non-governmental entities; over 300 applications received.
- **Startups & Innovation**: $68 million invested in startups in 2021; Agnikul and Skyroot lead in low-cost launch systems.

- **Manufacturing Synergy**: Over 60 PSLV launches supported by HAL; vital for self-reliance in space tech.
- **Global Outreach**: 42 foreign satellites launched in 2023 via NSIL, enhancing India's commercial space footprint.
- **Green Propulsion**: Bellatrix Aerospace is pioneering eco-friendly propulsion, aligning with sustainability goals.
- **Sectoral Impact**: Satellite services projected to contribute 36% of the space economy by 2025.

Key Challenges and Concerns:

- **Regulatory Ambiguity**: Lack of a comprehensive space law delays private participation; only 51 MoUs signed.
- **IP Restrictions**: Existing ISRO partnerships limit IP ownership of private players.
- **Funding Gaps**: Despite government VC funds, startups face issues in raising risk capital.
- **Security Risks**: Dual-use tech increases national security concerns with private access.
- **Tech Gaps:** Startups lack capability in deep-space missions, in-orbit refueling, etc.
- **Industry Fragmentation:** Over 200 fragmented startups, lacking an integrated supply chain.
- **Skilled Workforce Shortage**: Insufficient space-tech training infrastructure.

Way Forward – Measures to Promote Public-Private Partnership:

1. Streamlining Regulatory Framework:
- Develop transparent space policies on **satellite licensing, debris management, and IP rights.**
- Implement a **single-window clearance system via IN-SPACe.**

2. Creating a Unified Innovation Ecosystem:
- Establish space innovation hubs with shared infrastructure and public-private funding.
- Facilitate ISRO-private sector knowledge transfer.

3. Financial Incentives for Innovation:
- Provide **low-interest loans, grants, tax breaks for R&D-intensive space tech**.
- Create joint R&D funds with matched industry contributions.

4. Government Contracts as Catalysts:
- Offer long-term service contracts to private players in satellite services and launch vehicles.
- **Make the government a major customer to ensure predictable revenues.**

5. Skilling and Talent Development:
- Create specialized institutions and training programs in space tech.
- **Promote industry-academia collaboration for curriculum development.**

6. PPP in Space Infrastructure:
- Invite private investment in spaceports, testing facilities, and research centers.
- **Adopt revenue-sharing or shared ownership models.**

7. Clear IP and Tech Transfer Policy:
- Enable private IP ownership in public-private collaborations.
- **Foster R&D autonomy for startups** while ensuring ISRO's strategic oversight.

8. Promoting Global Commercialization:
- Facilitate foreign partnerships for satellite launches and services.
- Position India as a global provider of cost-effective space solutions.

Conclusion:

To fully harness its space potential, India must build a seamless public-private partnership ecosystem. **This requires regulatory clarity, financial support, IP protection, and a skilled workforce.** Aligning policies with global standards like the **Outer Space Treaty (1967) and Space Debris Mitigation Guidelines (2007)** will further ensure responsible and competitive space advancement.

36. The Need for Gender Equity in Urban Bureaucracy

Relevance to UPSC

Mains: GS Paper 1: Role of women and women's organizations,
GS Paper 2: Functions and responsibilities of ULBs; Issues relating to women and gender

Summary of the Article:

- India is projected to have over 800 million urban residents by 2050, making it central to global urban growth.
- **Urban spaces are not just about infrastructure but about democratic and developmental transformation, which must be inclusive.**
- Gender equity in urban governance is both a moral and structural necessity, not just an ideal.

Rise of Women in Politics:

- **33% reservation for women mandated by 73rd and 74th Amendments in local governance**; some states increased it to 50%.
- Resulted in 46% women among elected local representatives, building a pipeline of grassroots women leaders.

Persistent Gaps in Bureaucracy:

- **Only 20% of IAS officers are women**; even fewer in urban planning, engineering, and transport.
- In policing, **only 11.7% personnel are women, mainly in desk roles.**
- **Urban planning remains largely male-centric**, favouring large-scale infrastructure over neighbourhood-level needs, affecting women disproportionately.
- Women's urban mobility involves complex, **multi-stop journeys and reliance on public transport, yet policies do not reflect these realities.**

Gender-Responsive Budgeting (GRB):

- Introduced in India in 2005–06 as a method to integrate gender considerations in budgeting.
- **Though adopted in cities like Delhi, Kerala, and Tamil Nadu, it remains largely symbolic, lacking monitoring and institutional capacity.**
- Issues such as **pedestrian safety, lighting, and childcare are often neglected.**
- In contrast, **Rwanda, South Korea, Mexico, and the Philippines** have shown transformative use of GRB through participatory governance and result-based frameworks.

Successful Models:

- **Kerala's Kudumbashree programme** showcases participatory planning and community-driven development.
- **International models include:**
  - **Rwanda** – investments in maternal health and education
  - **Brazil** – sanitation and primary healthcare
  - **South Korea** – gender-responsive transit planning
  - **Philippines** – funding for gender-based violence shelters

Analytical Insights for Mains:

- **Urban governance reforms must go beyond quotas**: Political representation alone is insufficient if administrative, technical, and financial decision-making remains male-dominated.
- **Structural barriers need dismantling through:**
  - Affirmative recruitment policies
  - Scholarships/reservations in technical education
  - Gender audits and GRB tied to performance
- **Gendered urban design improves governance:**

- Better street lighting, safe public spaces, efficient transport, and childcare facilities directly improve women's participation in the economy and public life.

- **Local Gender Equity Councils can ensure accountability and inclusion in municipal decision-making.**

Conclusion:

- As India aspires for a $5 trillion economy, it must ensure its **urban spaces are inclusive, safe, and gender-sensitive.**
- Building cities for women begins with building them with women—through their active participation in urban governance, planning, budgeting, and service delivery.
- **Gender equity in urban bureaucracy is not just about representation**—it's about reshaping priorities, reallocating resources, and redefining development to reflect the needs of all citizens.

37. Crafting India's Educational Future

Relevance to UPSC:

Mains (GS Paper II): Issues relating to development and management of education, Government policies and interventions for development in various sectors, Social justice and inclusive growth

Summary of the Article:

While India's states vary in educational outcomes, financial prosperity alone is not a decisive factor. The key lies in consistent, long-term focus on foundational elements of education—like teacher quality, curriculum standards, and policy continuity. Reforms must be sustained and scalable to bring about deep and lasting impact.

Key Positive Developments in the Indian Education System:

1. Expansion of Digital Learning Infrastructure
- Initiatives like **PM eVidya, SWAYAM, and SWAYAM Prabha** have widened access.
- As of 2023, 400 million rural internet users boosted digital learning.
- However, **digital equity remains a challenge.**

2. Increased Focus on Skill Development and Vocational Education
- NEP 2020 **promotes vocational education from grade 6 and aims for 50% gross enrolment ratio by 2035**.
- Experiential learning and removal of rigid academic-vocational boundaries are emphasized.

3. Improvements in Teacher Training and Pedagogical Reforms
- NISHTHA has trained over 42 lakh teachers; NEP mandates 4-year integrated B.Ed. programs.
- Shift from **rote learning to student-centric and critical thinking-based approaches.**

4. Introduction of Foundational Literacy and Numeracy (FLN)
- NIPUN Bharat Mission targets universal FLN by 2025.
- Focus is on **literacy and numeracy by Grade** 3 as the basis for lifelong learning.

5. Increase in Public Investment and Infrastructure Upgrades
- Spending aimed at 6% of GDP; programs like **Samagra Shiksha Abhiyan and PM SHRI Schools** focus on infrastructure and digital facilities.

6. Focus on Multilingual Education and Regional Language Integration
- NEP 2023 emphasizes **education in mother tongue up to Grade 5.**
- **Promotes linguistic diversity and better comprehension**; benefits 25+ million students via regional digital content.

7. Internationalization of Education and Global Collaborations
- UGC guidelines **enable joint/twinning/dual degrees with foreign institutions.**
- Indian colleges expanding global partnerships and exchange programs.

8. Reform in Higher Education Governance and Autonomy
- Proposal for **Higher Education Commission of India (HECI).**
- Encourages institutional autonomy and innovation, improving global rankings.

Key Persistent Issues in the Indian Education System:

1. Unequal Access to Quality Education
- Only 18.47% of rural schools have internet; rural dropout rate is 37%.
- **Infrastructure and teacher quality lag in backward areas.**

2. Overemphasis on Rote Learning and Standardized Testing
- 25% of youth can't read Class II text, per ASER 2023.
- Focus remains on marks over **creativity and application.**

3. Teacher Shortages and Inadequate Training
- 1 million+ teacher vacancies, especially in rural areas.
- **Professional development remains sporadic and uneven.**

4. Poor Infrastructure and Resource Allocation
- 23% schools have unusable toilets, 11.5% have no separate girls' toilets.
- Basic amenities still lacking in many schools.

5. High Dropout Rates and Low Secondary Retention
- Dropout rate in Class 10 is 20.6% (2021–22).
- Financial stress and lack of engagement are key reasons.

6. Gender Disparity in Education
- 76% of girls who drop out are aged 15–18.
- **Safety, early marriage, and cultural factors** hinder girl education.

7. Lack of Career Guidance and Skill Development
- Employability remains low at 50.3% (India Skill Report 2023).
- **Academic curriculum is disconnected from market needs.**

8. Private vs. Public School Divide
- 67.51% of universities and 37.81% of colleges are private.
- **High fees and socio-economic divides worsen inequality.**

9. Insufficient Focus on Mental Health and Well-being
- 13,000+ student suicides in 2023 (NCRB).
- Lack of mental health support in schools and colleges.

Analytical Insights for Mains:

What Measures Can Enhance the Indian Education System?

1. Holistic and Interdisciplinary Curriculum Reform
- NEP 2020 calls for **integrated, project-based learning.**
- Fosters **critical thinking and creativity.**

2. Expansion of Vocational and Apprenticeship Programs
- Build industry-linked training from school level.
- **Target job-ready skills and reduced youth unemployment.**

3. Integration of Technology in Teacher Training
- Digital tools can personalize learning for teachers.
- **Use of AI and micro-credentialing improves pedagogy.**

4. Active Community and Parental Engagement
- Involve stakeholders in decision-making and school support.
- **Enhances student performance and accountability.**

5. Promoting Entrepreneurial Thinking and Innovation
- Introduce **design thinking and startup modules.**
- Establish innovation hubs in schools and colleges.

6. Improved Infrastructure for Inclusive Education
- Apply universal design principles for differently-abled.
- Hire special educators and therapists.

7. Streamlining and Strengthening Exam Systems
- Formative assessments via **PARAKH over rote-based testing**.
- Emphasize competency-based, stress-free evaluation.

8. Sustainability and Environmental Education Integration
- Include **eco-clubs and climate-focused curriculum**.
- Prepare students for climate-resilient citizenship.

9. Enhanced Public-Private Collaboration
- Private sector can aid in tech access, training, and pedagogy.
- Helps bridge gaps in public education infrastructure.

10. Focus on Rural and Remote Area Education
- Mobile learning centers, local volunteer schools, and digital centers.
- Incentivize teachers to serve in remote areas.

11. Strengthening Mental Health and Well-being Support
- Set up **counseling units, peer support groups, mindfulness programs.**
- Foster safe and emotionally nurturing environments.

Conclusion:

To achieve **SDG 4 (Quality Education) and enforce Article 21A (Right to Education), reforms must focus on inclusion, equity, and long-term resilience.**
Sustainable investments in **infrastructure, teacher development, and mental health support,** along with technological and vocational integration, are crucial.
India's educational future must prepare students not just for jobs, but to thrive in a complex, evolving world.

38. Unmasking Poverty in India

Relevance to UPSC

Mains:
GS2: Welfare schemes for vulnerable sections, poverty and hunger,
GS3: Inclusive growth, economic development, measurement of poverty

Summary of the Article

The article discusses the evolving landscape of poverty measurement in India, especially in light of the World Bank's updated poverty data in April 2025. **The World Bank claimed that only 5.75% of Indians live in extreme poverty, a significant drop from 27% in 2011–12, implying that 171 million people were lifted out of poverty over a decade.**
With India's last official poverty line based on the 2011–12 **Tendulkar Committee method, and the Rangarajan Committee's 2014** recommendations never formally adopted, the country now depends on NITI Aayog's MPI and World Bank's PPP-adjusted poverty line for updated insights.
The World Bank's poverty line, recently updated to $3/day (PPP) in June 2025, reflects local purchasing power, not direct market exchange. At the current PPP rate of ₹20.6/USD, the poverty threshold is ₹62/day in India.
The article points out that India's past poverty levels were overestimated (e.g., 47% in 1977–78 instead of 64%). Using the new benchmark, extreme poverty fell to just 7.5 crore people in 2022–23.

Despite the celebratory narrative, multiple poverty indicators paint a more nuanced picture:

- 5.75% below the WB's $3/day line
- **24% below the lower-middle-income threshold**
- 66% receiving food subsidies
- 83% living on just ₹171/day

This disparity between **statistical definitions and actual deprivation questions the true understanding of poverty in India.**

Analytical Insights for Mains

- **Poverty Measurement Ambiguities**: The **absence of a uniform national poverty line and the non-adoption of Rangarajan recommendations** indicate institutional hesitation in updating poverty metrics, which affects policy targeting and evaluation.
- **PPP vs Nominal Misinterpretation**: The misuse of exchange rates (₹85/USD instead of ₹20.6/USD) often distorts public understanding of the poverty line. **The PPP approach, while appropriate for international comparisons, might underplay the domestic hardship faced by millions.**
- **Poverty vs Welfare Dependence**: With 66% of Indians receiving subsidized food, a broader definition of poverty—including vulnerability and dependence—may be more reflective than the narrow income-based cutoffs.
- **Policy Dissonance**: The **₹62/day poverty line contrasts with the ₹12 lakh annual tax exemption**, exposing a disjunction between welfare thresholds and fiscal policy.
- **Multidimensional Poverty Imperative**: The article underlines the need for **dynamic, multidimensional poverty assessments rather than static income benchmarks, particularly in a post-pandemic and inflation-affected economy.**

PRELIMS BOOSTER (THE HINDU & INDIAN EXPRESS)

2 JUNE

1. IndiaAI Mission

Launched in **2023** as a **joint initiative of MeitY and NASSCOM**. Aims to strengthen **India's AI ecosystem by providing high-end computing resources** to startups and researchers. Focuses on "**Making AI in India" and "Making AI Work for India**". Implemented by **IndiaAI**, an independent division under MeitY. Promotes **ethical, responsible, and inclusive AI use**.

Key pillars: **Common Compute Facility, AI Kosha, AI Safety Institute, Innovation Centre, Application Development, Future Skills, Startup Financing**

2. Zangezur Corridor

Zangezur Corridor is a proposed transport route to connect **Azerbaijan with its exclave Nakhchivan**, bypassing Armenia's Syunik Province. Zangezur (in southern Armenia) has been a **disputed territory since World War** I. On Azerbaijan's side, it links with the **Horadiz-Agbend highway and railway; on Turkey's side, with the Nakhchivan-Igdir-Kars route.** It holds strategic and economic significance for the South Caucasus. Aims to boost trade, reduce transport costs, and enhance Eurasian connectivity.

3. Thrombectomy

Thrombectomy is a procedure to **remove blood clots from arteries or veins to restore blood flow. Blood clots (thrombi) can block circulation**, causing tissue damage or death. Common sites include the legs, arms, intestines, brain, lungs, and heart. Urgent thrombectomy may be required within hours to prevent life- or limb-threatening complications.

Two types of thrombectomy:

- **Surgical thrombectomy** involves open surgery to remove the clot.
- **Percutaneous thrombectomy** uses catheters and devices to break or suction clots, sometimes with local clot-dissolving drugs.

4. Netravati River

Netravati is a major west-flowing river in Karnataka, originating from the **Bangrabalige Valley in the Kudremukha** range at about 1,300 m in Chikkamagaluru. Known as **the lifeline of Dakshina Kannada**, it spans 103 km and drains an area of 3,657 sq.km. It merges with the **Kumaradhara River at Uppinangadi** and flows into the Arabian Sea via Mangalore. Important towns include **Bantwal and Dharmasthala.**

Major tributaries: Kumaradhara, Kapila, Gundya, Mrithyunjaya, Somavathi, Aniyoor, and Kaniyoor.

5. Kawal Tiger Reserve

Kawal Tiger Reserve is located in **Telangana along the Godavari River in the Deccan peninsula-central highlands.** It lies in the southern-most tip of the Central Indian Tiger Landscape, connected to **Tadoba-Andhari (Maharashtra) and Indravati (Chhattisgarh) reserves**. Situated in the Sahyadri ranges.

Vegetation type: Southern Tropical Dry Deciduous Forest.

Under **Section 36(A) of the Wildlife Protection Act, 1972**, states can declare Conservation Reserves on state-owned lands linking protected areas.

3 JUNE

1. Birch Glacier

Birch Glacier is located in the **Lötschental valley in northern Switzerland**. It collapsed and blocked the flow of the Lonza River. It was the **only Swiss glacier advancing rather than retreating, but not due to increased snowfall**. The advance was likely caused by pre-loading with rockfalls from a nearby mountain that eventually collapsed. Glaciologists warn of accelerated glacier retreat in Switzerland due to global warming. **Switzerland lost 4% of its glacier volume in 2023, the second-highest after a 6% loss in 2022**. Switzerland has the **most glaciers in Europe** despite being landlocked.

2. ULLAS - Nav Bharat Saaksharta Karyakram

Goa became fully literate under the ULLAS Scheme, marking progress toward **India's full literacy by 2030**. ULLAS (2022–2027) is a centrally sponsored scheme aligned with NEP 2020, targeting adults aged 15+ who missed schooling.

It covers 5 components: **Foundational Literacy, Critical Life Skills, Basic Education, Vocational Skills, and Continuing Education**.

Based on **volunteerism and Kartavya Bodh, aiming for Jan Saaksharta**. The ULLAS app enables registration and provides access to DIKSHA portal learning resources.

3. NAKSHA Programme

NAKSHA stands for **NAtional geospatial Knowledge-based land Survey of urban Habitations**. It is a **city survey initiative under the Digital India Land Records Modernization Programme (DILRMP)**. Implemented by the **Department of Land Resources (DoLR), Ministry of Rural Development**. Aims to create a comprehensive geospatial database for urban land records. **Uses aerial and field surveys integrated with GIS technology**. Enhances land governance, streamlines property records, and aids in urban planning. The pilot phase covers 152 urban local bodies across 26 states, with area <35 sq km and population <2 lakhs. **Survey of India is the technical partner, providing orthorectified imagery via third-party vendors**. Supports better decision-making, efficient land use, and smoother property transactions. The

second phase of capacity-building under NAKSHA starts on 2nd June 2025, across five Centres of Excellence.

4. Krishi Nivesh Portal

Launched by the **Ministry of Agriculture & Farmers Welfare**. Serves as a **one-stop platform for farmers, entrepreneurs, and investor**s. Provides access to Central and State agri-related schemes. Enhances **agribusiness, attracts investment, and boosts farmers' income**. Offers real-time chatbot support, dashboards, and scheme tracking. **Covers 17 flagship schemes from 7 ministries, including Agriculture Infrastructure Fund, PM-KUSUM**, etc. Streamlines investment process with transparency and efficiency.

5. Dibang River

Dibang River is a **major tributary of the Brahmaputra River, flowing through Arunachal Pradesh and Assam**. It originates near Keya Pass in the Upper Dibang Valley, Arunachal Pradesh. The river flows through the Great Himalayan Range and Mishmi Hills, which are a southward extension of the Himalayas. Passes like **Yonggyap (13,000 ft) and Kaya (15,600 ft) are found here**. It joins the Lohit and Siang rivers in Assam to form the Brahmaputra.

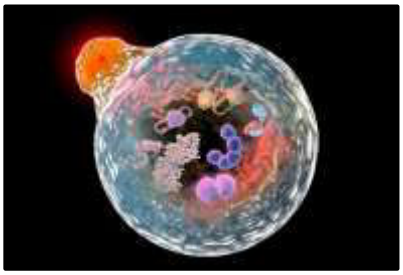
Major tributaries: Dri, Mathun, Talon, Eme, Ahi, Emra, and Awa.

4 JUNE

1. National Centre for Disease Informatics and Research (NCDIR)

National Centre for Disease Informatics and Research (NCDIR) is a permanent institute under ICMR, located in Bengaluru, Karnataka. It integrates information science with health research, focusing on **cancer, diabetes, CVD, and stroke**. Aims to create a **national database using electronic information technology**. Supports and collaborates with Central/State governments and medical institutions. Provides technical support and standardized data formats. Develops software for **data capture, analysis, and promotes health/disease informatics.**

2. Lysosomal Storage Disorders (LSDs)



Lysosomal Storage Disorders (LSDs) are **rare genetic conditions causing toxic buildup in cells due to enzyme deficiencies**. Examples include **Gaucher, Pompe, Fabry, MPS I & II, and other mucopolysaccharidoses**. Most LSDs are autosomal recessive; **Hunter syndrome and Fabry disease are X-linked**. LSDs usually begin in infancy, rarely in adulthood. **Lysosomes help in breaking down cell waste; enzyme defects hinder this process**. No cure exists, but treatments can manage symptoms and reduce organ damage.

3. MERCOSUR

MERCOSUR (Southern Common Market) is a South American regional economic bloc formed by the **1991 Treaty of Asunción.**

Founding members: Argentina, Brazil, Paraguay, Uruguay; later joined by Bolivia and Venezuela (Venezuela suspended since 2016).

Associate members: Chile, Colombia, Ecuador, Guyana, Peru, Suriname.

Headquarters: Montevideo, Uruguay.

Languages: Spanish and Portuguese.

Main goal: Free movement of goods, services, capital, and people.

India signed a PTA with MERCOSUR in 2004. Fourth largest integrated market globally.

4. International Air Transport Association

Founded on **19 April 1945 in Havana, Cuba**

Headquarters: Montreal, Canada Successor to the 1919 International Air Traffic Association

Members: ~350 from 120 countries

Last AGM in India: 1983

Objectives:

- Promote **international air transport growth**
- Ensure **inter-airline cooperation**
- Enhance safety in air transportation
- Create **global air traffic rules and standards**

5. BharatGen

BharatGen is **India's first AI-based, multimodal Large Language Model (LLM)** for Indian languages. **Developed under NM-ICPS, implemented via IIT Bombay's TIH Foundation**. Supported by the Department of Science and Technology (DST). Integrates text, speech, and image; supports 22 Indian languages.

Targets key sectors: healthcare, education, agriculture, and governance. Executed through 25 TIHs, with 4 upgraded to TTRPs.

Key features: multilingual, Bhartiya datasets, open-source, and Generative AI ecosystem. Focuses on technology, entrepreneurship, HR development, and international collaboration.

9 JUNE

1. Chenab Railway Bridge

Located in **Reasi district, J&K, the Chenab Bridge is part of the Udhampur-Srinagar-Baramulla Rail Line.** Built 359 m above Chenab River, it is the **world's tallest railway arch bridge.** Spans 1,315 m; designed to withstand winds (266 km/h), earthquakes (magnitude 8), and -20°C temperatures. Executed by Konkan Railway, Afcons, VSL India, Ultra Engg. Supported by **SAIL, IISc, IITs, DRDO, and Swiss firm Mageba.**

2. Loan-to-Value (LTV) Ratio

Loan-to-Value (LTV) Ratio indicates the **percentage of an asset's value a lender finances.**

Formula: LTV = (Loan Amount / Appraised Value) × 100.

Higher LTV implies higher risk and usually higher interest rates. More desirable assets have higher LTVs due to value stability and ease of transfer.

Reserve Bank of India (RBI) revised LTVs for gold loans:

- **Up to ₹2.5 lakh**: LTV raised to 85%
- **₹2.5–5 lakh:** LTV is 80%
- **Above ₹5 lakh:** LTV remains at 75%.

3. Indian Council of Arbitration (ICA)

Indian Council of Arbitration (ICA) was **established in 1965 under the initiative of the Government of India and FICCI**. It is one of the oldest arbitral institutions in India. Registered under **the Societies Registration Act, 1860, it operates on a not-for-profit basis**. Its objective is to **promote amicable, quick, and inexpensive resolution of commercial disputes through arbitration and conciliation**. ICA administers arbitration proceedings as per its own procedural rules. It also promotes capacity-building in ADR mechanisms.

Head office: New Delhi.

4. Diphtheria

Highly contagious bacterial infection caused by **Corynebacterium diphtheriae producing a toxin**. Spreads via respiratory droplets and contact with infected sores. Affects respiratory tract and sometimes the skin (skin infections rarely severe).

Symptoms: sore throat, fever, swollen neck glands, weakness; may form thick grey coating in throat, obstructing breathing.

Treatment: Diphtheria Antitoxin (DAT), antibiotics, and supportive care.

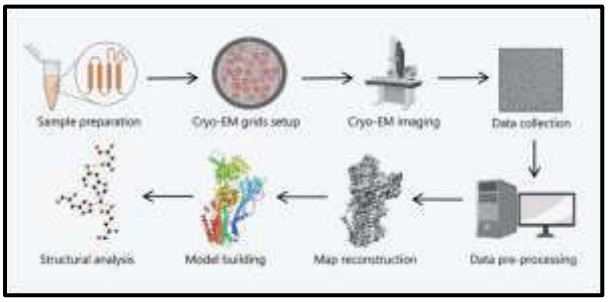
In **advanced stages, it can damage the heart, kidneys, and nervous system.**

5. Index Cards

Index Cards are **non-statutory, post-election statistical formats** developed suo moto by the Election Commission of India (ECI). They **aim to enhance accessibility of constituency-level election data for various stakeholders**. Cover multi-dimensional data: candidates, vote shares, gender patterns, regional trends, etc. **Serve as the basis for 35 Lok Sabha and 14 State Assembly statistical reports**. Earlier, data was manually compiled on physical cards, causing delays in dissemination.

10 JUNE

1. Cryo-Electron Microscopy (Cryo-EM)



Cryo-Electron Microscopy (Cryo-EM) is **used to study the 3D structure of biological molecules and won the 2017 Nobel Prize in Chemistry**. It provides high resolution (1.5–3.5 Å) but needs high sample concentration, making it inefficient for rare molecules. **Magnetic Isolation and Concentration Cryo-EM (MagIC) is an improved technique**. MagIC enables imaging of samples 100 times more dilute, allowing the study of low-abundance molecules efficiently with less sample volume.

2. Inga 3 Hydropower Project and Congo River

World Bank approved $250 million for the Inga 3 Hydropower Project in the **Democratic Republic of Congo (DRC**). Inga 3 is a proposed 11,050 MW project on the Congo River, **part of the Grand Inga Project (target: 42,000+ MW).**

Congo River flows through 6 countries: Cameroon, Central African Republic, DRC, Republic of Congo, Equatorial Guinea, and Gabon. It is the **2nd largest river by flow (after Amazon), 2nd longest in Africa (after Nile), and crosses the equator twice**. The basin hosts the world's largest tropical peatlands.

3. Marine Spatial Planning (MSP)

India and Norway co-hosted a high-level event on Marine Spatial Planning (MSP) at the Monaco Marine Conference. India showcased its SAHAV portal, a GIS-based decision support system offering real-time spatial data for smart marine planning. **Pilot MSP projects in Puducherry and Lakshadweep focus on coastal erosion control and biodiversity management.** MSP is a public process that allocates marine space for human activities to **meet ecological, economic, and social goals.** It supports sustainable ocean governance through science-based planning.

4. Arsia Mons

Arsia Mons is a **massive shield volcano located in the Tharsis region of Mars**. It stands over 18 km tall with a base diameter of more than 300 km. It is the **southernmost volcano among the three Tharsis Monte**s. The volcano has a caldera about 110 km wide. Formed by fluid basaltic lava flows, typical of shield volcanoes. Shows signs of volcanic activity spanning billions of years. Most recent eruptions may have occurred within the last 2 million years. **Its flanks are covered in lava flows, channels, and other volcanic features.**

5. Himalayan Long-tailed Myotis

Himalayan Long-tailed Myotis is **a newly discovered bat species in the Western Himalayas.** Belongs to the Myotis frater complex, found across Asia and parts of Central Asia.

Habitat: Resides in Deodar, Pine, and Cedar forests on the southern Himalayan slopes.

Features: Medium-sized (3.5 inches), delicate feet, long thumbs, short ears, and fine teeth. Found in **Uttarakhand (India) and Khyber Pakhtunkhwa (Pakistan).**

Ecological Role: Controls insect pests, helps in pollination, seed dispersal, and provides guano fertilizer.

11 JUNE

1. National Investment and Infrastructure Fund (NIIF)

The National Investment and Infrastructure Fund (NIIF) is a **government-anchored investment platform launched in 2015 to mobilize long-term capital for infrastructure and strategic sectors**. It operates as a Category II SEBI-registered AIF with a 49:51 public-private equity structure. **Headquartered in Mumbai, it is managed by CEO Sanjiv Aggarwal under the Ministry of Finance**. NIIF has an AUM of ₹30,000 crore, catalyzing ₹1.17 lakh crore in investments. The **Governing Council, chaired by the Finance Minister, oversees strategy and fund deployment**. It focuses on capital mobilization, strategic partnerships, and aligning with initiatives like Make in India and green infrastructure

2. India's first E-Waste Recycling Eco Park

India's first E-Waste Recycling Eco Park is being developed in **Holambi Kalan, North Delhi, as a model for sustainable e-waste management and to promote a circular economy**. Announced by Delhi's Environment Minister, it **follows the DBFOT (Design, Build, Finance, Operate, Transfer) model under Public-Private Partnership (PPP).** The park will be **developed by DSIIDC** through a global tender and will operate under a 15-year concession period Spread over 11.4 acres, it will **feature integrated recycling infrastructure for collection, dismantling, recycling, and refurbishmen**t. It aims to process 51,000 metric tonnes of e-waste annually and handle all 106 e-waste categories under the E-Waste Management Rules, 2022. With an investment of ₹150 crore and a revenue target of ₹350 crore, the **project will generate thousands of green jobsand train informal workers.** Scheduled for completion in 18 months, the park will **serve as a national benchmark for eco-friendly e-waste processing.**

3. Bhagwan Birsa Munda

Bhagwan Birsa Munda (1875–1900) was a revered tribal freedom fighter, social reformer, and spiritual leader, **known as "Dharti Aaba" (Father of the Earth).** Born in Ulihatu, Chotanagpur Plateau, he **belonged to the Munda tribe** and was educated

in Christian missionary schools but later **embraced Vaishnavism and tribal traditions**. He **founded the Birsait sect, opposing zamindari exploitation, forced labour (beth begari), and colonial forest policies**. Led the **Ulgulan Movement (1895–1900) against British rule, using guerrilla tactics and rallying tribal pride with the slogan: "Abua Raj setar jana, Maharani Raj tundu jana."** Arrested in 1895, he died in Ranchi Jail in 1900. Inspired the Chotanagpur Tenancy Act (1908) to protect tribal land. Honoured posthumously with institutions in his name and **Janjatiya Gaurav Diwas observed on November 15.**

4. Pradhan Mantri Suraksit Matritva Abhiyan (PMSMA)

Pradhan Mantri Surakshit Matritva Abhiyan (PMSMA) is a **flagship maternal health programme launched in June 2016 by the Ministry of Health & Family Welfare.** Aims to **provide free, quality antenatal care (ANC) to pregnant women on the 9th of every month**. Ensures at least one ANC check-up in the 2nd or 3rd trimester by trained specialists. Focuses on **early detection and management of high-risk pregnancies** (HRPs) with a name-based tracking system. Fixed ANC Days at government facilities deliver investigations, IFA/calcium supplements, and counselling through a single-window system. Specialist-driven care includes OB-GYNs, radiologists, and private volunteers. Risk tagging with green (no risk) and red (HRP) stickers on MCP cards for better management. Backed by **digital monitoring via a national portal and mobile app to ensure transparency and follow-up.**

12 JUNE

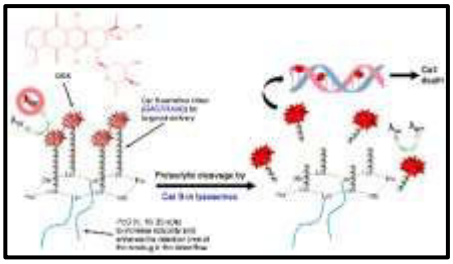
1. SARAT (Search and Rescue Aid Tool)

INCOIS issued a drift and oil spill advisory after a fire on a container ship off the Kerala coast. It **activated SARAT (Search and Rescue Aid Tool) to track drifting containers and debris**. SARAT is **developed by ESSO-INCOIS under the Ministry of Earth Sciences and the Make in India program**. It helps in locating individuals or vessels in distress quickly. Supports Indian Coast Guard, Navy, and Coastal Security Police. Uses high-resolution ocean models run on high-performance computers.

2. Financial Stability and Development Council (FSDC)

Financial Stability and Development Council (FSDC) is a **non-statutory apex body set up in December 2010**. Its objective is to **maintain financial stability and promote financial sector development**. **Chaired by the Union Finance Minister**, it includes key members like the RBI Governor, Finance Secretary, and heads of SEBI, IRDAI, PFRDA. A sub-committee, chaired by the RBI Governor, supports FSDC's functioning. **The 29th meeting was recently held under the Finance Minister's chairmanship.**

3. Cathepsin B (Cat B)



Cathepsin B (Cat B) is a **lysosomal cysteine protease involved in protein turnover, antigen processing, and apoptosis**. It is located primarily in lysosomes, which break down proteins, nucleic acids, carbohydrates, and lipids. **Degrades extracellular matrix proteins like collagen and fibronectin.** Researchers at NIAB found reducing Cat B activity preserves ovarian reserve. **Linked to diseases such as cancer metastasis, inflammation, and neurodegenerative disorders.**

4. CAQM

CAQM is a statutory body established under the **Commission for Air Quality Management in NCR and Adjoining Areas Act, 2021.**

Nodal Ministry: Ministry of Environment, Forest and Climate Change.

Headquarters: Delhi.

It has partnered with CSIR-CRRI and School of Planning and Architecture (SPA) to reduce dust pollution via urban road redevelopment in NCR. Empowered to issue directions to protect and improve air quality in NCR and adjoining areas of Haryana, Punjab, Rajasthan, and Uttar Pradesh.

5. Poson Poya

Poson Poya is a **key Buddhist festival in Sri Lanka, second only to Vesak**, celebrated on the full moon day of June. It marks the **arrival of Buddhism in Sri Lanka in 236 BCE by Arahat Mahinda, son of Emperor Ashoka**, who converted King Devanampiyatissa at Mihintale. The festival signifies a **cultural and spiritual transformation in Sri Lankan history**. Celebrated mainly at Mihintale and Anuradhapura, with white-clad devotees, temple visits, meditation, dansals, and religious pageants. **Promotes values of ahimsa, unity, and compassion.**

13 JUNE

1. World Day Against Child Labour 2025

Observed annually since 2002 by the ILO to raise awareness against child labour.

2025 theme: "Progress is clear, but there's more to do: let's speed up efforts!" 138 million children involved globally in 2024; Africa and Asia-Pacific worst affected.

India's 2011 Census: 10.1 million child workers, down from 2001 but still significant.

India's 1987 National Policy focuses on rehabilitation and tackling poverty. **SDG 8.7 aims to eliminate child labour by 2025, but goal unlikely to be met.**

2. TOI-6894b

TOI-6894b is a **gas giant planet about the size of Saturn**, but with just over half its mass, making it extremely low in density**. It orbits a very small red dwarf star (TOI-6894), only 21% the Sun's mass and 250 times dimmer**. The planet completes an orbit in under 3 Earth days. This rare pairing challenges the core accretion theory of planet formation. May imply more gas giants exist around small stars than expected. **Planned JWST studies may reveal its atmospheric composition.**

3. UN High Seas Treaty

The UN High Seas Treaty (BBNJ) is **the first legally binding international treaty to protect marine biodiversity in international waters**. It builds on the **1982 UN Convention on the Law of the Sea (UNCLOS).** Covers two-thirds of the ocean and aims to fill regulatory gaps in ocean governance.

Key provisions:

- Marine Protected Areas (MPAs)
- Environmental Impact Assessments (EIAs)
- Equitable sharing of Marine Genetic Resources (MGRs)
- Capacity building and technology transfer for developing countries

4. Exercise Khaan Quest

Exercise Khaan Quest is a **multinational peacekeeping exercise held in Mongolia, with its 22nd edition in 2024**. Started in 2003 as a **bilateral event between the USA and Mongolian Armed Forces**, it became multinational in 2006. **India is participating with 40 personnel, including one woman officer and two women soldiers from the Kumaon Regiment**. The aim is to enhance interoperability, joint planning, tactical drills, and UN peacekeeping readiness (Chapter VII). Focuses on physical fitness and sharing best practices among nations.

5. CROPIC Initiative Summary

CROPIC (Collection of Real Time Observations & Photo of Crops) is launched under PMFBY. It aims to monitor crop health, assess losses using AI and photo analytics, and automate insurance claim processing. **Farmers will crowdsource photos via the CROPIC mobile app**, taken 4–5 times per season. Covers Kharif 2025 and Rabi 2025–26 in at least 50 districts per season across agro-climatic zones. **Funded by FIAT under PMFBY. Utilizes AI-based cloud platform and web dashboards for analysis.**

6. Eurasian Otter

Also known as **European otter**, it is a semi-aquatic carnivorous mammal native to Eurasia.

Wide distribution: From Europe and Middle East to China and India (north, northeast, south).

Habitat: Found in lakes, rivers, marshes, and coastal areas, especially cold hills and streams in India.

Features: Sleek fur, webbed feet, acute senses, solitary nature.

Conservation status:

- **IUCN:** Near Threatened
- **WPA, 1972:** Schedule II
- **CITES:** Appendix I

Threats: Water pollution, fur hunting.

16 JUNE

1. AviList

AviList is the **first-ever unified global checklist of bird species, launched to support effective bird conservation.** It replaces the International Ornithological Committee (IOC) and Clements lists, with annual updates. **It offers the most current and authoritative bird taxonomy**. Developed through a collaborative global effort including **BirdLife International, Cornell Lab of Ornithology, and others**. The checklist includes 11,131 species, 19,879 subspecies, 2,376 genera, 252 families, and 46 orders.

2. Shipki La

Shipki La is a **mountain pass located in the Kinnaur district of Himachal Pradesh** on the India-Tibet (China) border. It lies at an elevation of 3,930 meters and serves as a border post. **The Sutlej River enters India through this pass from Raksas Tal near Mansarovar**. Historically part of the ancient Silk Route, it held major trade importance**. Border tourism activities were recently launched here**. It was closed post-COVID in 2020.

3. Aircraft Accident Investigation Bureau (AAIB)

Established in 2012 under the **Ministry of Civil Aviation. Formed to fulfil India's obligations under Annex 13 of the Convention on International Civil Aviation (1944).** Investigates aircraft accidents and serious incidents involving aircraft with All-Up Weight (AUW) over 2250 kg or turbojet aircraft. **Operates under the Aircraft (Investigation of Accidents and Incidents) Rules, 2017**. Also supports the Court or Assessors appointed by the Central Government during investigations.

4. Statins

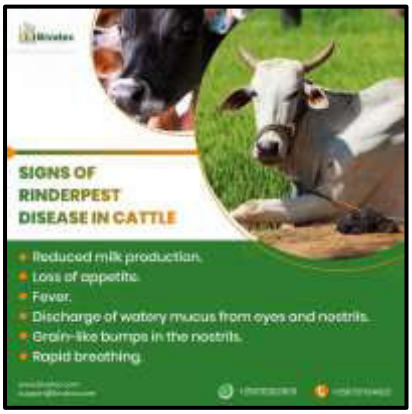
A new study highlights the **role of Statins in reducing the death rate among Sepsis patients**. Sepsis is a life-threatening condition caused by an **exaggerated immune response to infection**. Statins are medicines used to lower LDL (bad) cholesterol and treat cardiovascular diseases. They possess **anti-inflammatory, immunomodulatory, antioxidative, and antithrombotic properties.** Statins help control inflammation, restore endothelial function, and may have antimicrobial effects.

5. PRASHAD Scheme

Launched in 2014-15 by the **Ministry of Tourism as a Central Sector Scheme**. Focuses on integrated development of pilgrimage and heritage sites. **Aims to enhance tourism infrastructure for better pilgrim and visitor experiences**. Provides financial assistance to States/UTs. **Promotes CSR and Public-Private Partnerships (PPP).** Supports development of entry points, last-mile connectivity, eco-friendly transport, basic amenities (toilets, drinking water, first aid), and digital facilities (internet, telecom).

18 JUNE

1. Rinderpest



ICAR-NIHSAD, Bhopal has been recognized as a Category A Rinderpest Holding Facility by the World Organisation for Animal Health (WOAH) and UN FAO. It is a reference lab for avian influenza and researches exotic & emerging animal pathogens. **Rinderpest is a viral disease of cloven-hoofed animals (mainly cattle and buffalo).**

Caused by: Morbillivirus (Paramyxoviridae family).

Highly contagious, not transmissible to humans, and often fatal. Now eradicated, it is the second disease eliminated globally after smallpox.

2. Dharti Aaba Janbhagidari Abhiyan

Launched by: Ministry of Tribal Affairs

Objective: Empower tribal communities through benefit saturation camps at village/habitation level

Services Provided: Critical government services like Aadhaar enrolment/updates

Part of: Janjatiya Gaurav Varsh – celebrates tribal legacy and contributions

Core Principles: Last-mile delivery, Janbhagidari (people's participation), and dignified empowerment

Linked Initiatives: PM-JANMAN and Dharti Aaba Janjatiya Gram Utkarsh Abhiyan

3. Fast Patrol Vessel (FPV) Achal

Fifth FPV Achal launched by **Goa Shipyard Ltd for the Indian Coast Guard**. It is the 5th vessel in a series of 8 Fast Patrol Vessels.

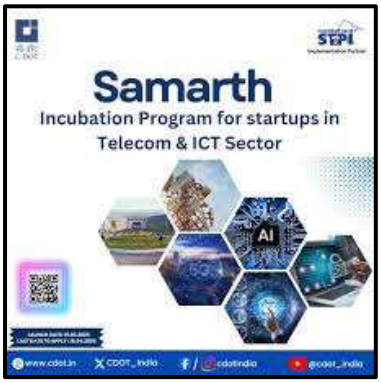
Primary roles: Protection, monitoring, control, surveillance, and safeguarding offshore assets and island territories.

Built under **dual-class certification from American Bureau of Shipping and Indian Register of Shipping.** Developed with 60% indigenous content, aligned with Atmanirbhar Bharat in defence manufacturing.

4. WHA Resolution on Skin Diseases

The World Health Assembly (WHA) adopted a resolution titled **"Skin Diseases as a Global Public Health Priority."** Skin diseases affect 1.9 billion people globally but remain underfunded and overlooked, especially in low- and middle-income countries**. Backed by the International League of Dermatologic Societies (ILDS)**. Calls for **a Global Action Plan focusing on prevention, early detection, treatment, and long-term care**. Urges dedicated health investments and enhanced research, surveillance, and data collection.

5. Samarth Program



Launched by C-DOT, the R&D centre under the Department of Telecommunications. It is a **startup incubation program to promote innovation in India's telecom and IT sectors**. Provides grants up to ₹5 lakh/startup, along with infrastructure, mentorship, and networking support. 18 startups recently received grants under the program.

Implementation partners: Software Technology Parks of India (STPI) and The Indus Entrepreneurs (TiE).

STPI operates under the Ministry of Electronics and IT (MeitY).

19 JUNE

1. SIPRI Yearbook 2025 – Key Highlights on India and Global Nuclear Trends

India has 180 nuclear warheads (Jan 2025), with a mature nuclear triad and focus on canisterised, MIRV-capable missiles. **Signs of shift from de-alerted to mated warhead posture**. Pakistan has 170 warheads, expanding tactical delivery systems aimed at India. **China possesses 600 warheads, building 350 ICBM silos, likely moving to peacetime readiness.**

Global stockpile: 12,241 warheads; Russia and USA hold over 90%.

Arms control crisis looms post New START expiry (2026). AI, cyberwarfare, and disinformation heighten nuclear risk. India must ensure strategic autonomy, uphold credible minimum deterrence, and support nuclear risk reduction dialogue.

2. Inclusive Pension System for India – Key Highlights

Pension coverage remains low: only 12% of workforce and 5.3% of population covered (FY24 India's pension assets are just 17% of GDP vs 80% in OECD nations. Old-age dependency to reach 30% by 2050, risking elderly poverty.

Key schemes: NPS, APY, and Unified Pension Scheme (UPS); however, most APY users opt for lowest ₹1,000 pension.

Challenges: fragmentation, voluntary opt-in, low adequacy, and fiscal risks.

Reforms needed: unified tiered framework, mandatory basic pension, digital access, financial literacy, and auto-enrolment to ensure universal, sustainable pension coverage.

3. Bonn Climate Change Conference 2025 – Key Highlights

A mid-year UNFCCC conference held annually in **Bonn, Germany since 1995.**

Organised by the **UNFCCC Secretariat**, it prepares groundwork for COP Summits.

Key aims: review climate agreements, enable finance & technology transfer, and promote science–policy interface.

4. Core bodies:

- SBI (Implementation of climate actions)
- SBSTA (Scientific and technological advice via IPCC reports)

2025 Theme: Operationalising the Global Goal on Adaptation (GGA) — focuses on measurable, equitable targets for vulnerable nations.

Involves UN members, NGOs, scientists, and pushes for actionable roadmaps linking policy and implementation.

5. International Big Cat Alliance (IBCA) – Key Highlights

Launched by **India in March 2024, coordinated by NTCA under MoEFCC**. Aims to protect seven big cat species**: Tiger, Lion, Leopard, Snow Leopard, Cheetah, Jaguar, and Puma**. Focuses on global collaboration, knowledge exchange, and capacity building.

Objectives: conservation, data sharing, financing, climate resilience, and sustainable livelihoods.

Membership: 95 eligible range countries; 25 joined by Sept 2024.

Key functions: shared best practices, training programs, policy reforms, and anti-poaching coordination.

Acts as a **global platform for technical, institutional, and financial support for big cat conservation.**

20 JUNE

1. Reverse Flipping

Flipping refers to **Indian start-ups shifting ownership and assets abroad for tax benefits, capital access, and IP protection**. **Reverse Flipping (internalisation) is the process of bringing back the company's domicile to India.** Key reasons include plans to list on Indian stock exchanges, favourable policies, and growing market confidence. **SEBI aims to ease norms to encourage reverse flipping.**

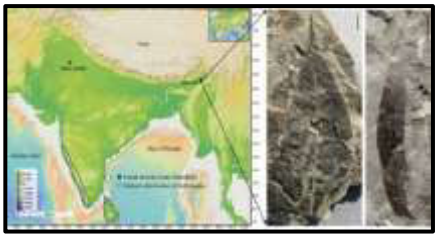
Common methods: Inbound Merger and Share Swap Arrangement for legal and tax efficiency.

2. Cook Islands

Cook Islands **comprise 15 islands in the South Pacific Ocean**, spread over 2 million sq. km. **Located between Hawaii and New Zealand, with Avarua (on Rarotonga) as capital**. Divided into northern coral atolls and southern volcanic islands**. Te Manga (652 m) is the highest point;** most people live on Rarotonga. Self-governing in free association with New Zealand since 1965. **Citizens have New Zealand citizenship**. **Parliamentary democracy under a constitutional monarchy.**

Currency: New Zealand Dollar (NZD).

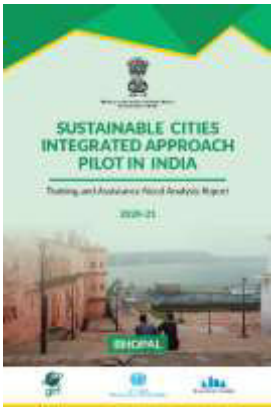
3. Nothopegia



Nothopegia is a **genus in the Anacardiaceae family, native to India, Bangladesh**, and Sri Lanka, now found in the Western Ghats. Researchers discovered 24–23 million-year-old fossilized leaves of **Nothopegia in the Makum Coalfield, Assam**, marking the oldest known fossil record of the genus. **The region's climatic shifts due to Himalayan uplift made it unsuitable for tropical flora**. Western Ghats' stable climate preserved the species.

Methods used: Herbarium comparison, CLAMP, Cluster analysis.

4. Sustainable Cities Integrated Pilot Approach Project



Aims to promote sustainable urban planning and integrated service delivery in Indian cities, supported by UN-Habitat and UNIDO. Implemented in 5 pilot Indian cities: **Bhopal, Guntur, Mysore, Vijayawada, and Jaipur.** Part of a global initiative aiding 28 cities across 11 countries to tackle environmental degradation. **Funded by the Global Environment Facility (GEF) and coordinated with the Ministry of Housing and Urban Affairs.**

Objective: attract investments in green infrastructure to cut GHG emissions and improve citizens' quality of life.

UN-Habitat is the UN's focal point for sustainable urban development, based in Nairobi.

5. Fourier Transform InfraRed (FTIR) Spectroscopy

FTIR Spectroscopy is a **technique used to identify chemical constituents by analyzing molecular vibrations**. It uses infrared light to scan samples and detect functional groups and molecular structures. Useful for analyzing particles of 10–50 microns and larger surface areas. **Applications include air, water, and soil quality monitoring, pollution studies, and industrial quality control**. It is valuable in **environmental and health assessments, especially in sensitive regions like the Himalayas.**

24 JUNE

1. Coffee

India's coffee exports rose by 125% in the past 11 years, reaching USD 1.8 billion. **Coffee is a tropical plant, with Arabica (75%) and Robusta** as key commercial varieties.

Climatic needs: 150–300 cm rainfall, 15–24°C for Arabica, and 24–30°C for Robusta.

Brazil is the largest global producer. In India, **Karnataka leads in production**, followed by **Kerala and Tamil Nadu**. **Grown mainly in Western and Eastern Ghats.**

2. Nano Fertilizers

IFFCO is setting up its first overseas nano fertiliser plant in Brazil. **It launched the world's first Nano Liquid Urea in 2021 and Nano-DAP in 2023.** Nano fertilisers are nutrients encapsulated in nanomaterials (<100 nm). They allow controlled release and slow diffusion into the soil.

Benefits include:

- **Sustainable farming by reducing soil and water contamination**.
- **Cost-effectiveness** through better nutrient absorption, reduced wastage, and lower application frequency.

3. Subarnarekha River

Subarnarekha River means "golden line" (Subarna = gold, Rekha = line). Originates near Piska village, close to Ranchi, Jharkhand. **Flows through Jharkhand, Odisha, and West Bengal. Empties into the Bay of Bengal.**

Major tributaries: Kanchi, Karkari, and Kharkai.

Hundru Falls is located on this river. Declared as National Waterway-96 under the National Waterway Act, 2016. Recently caused flash floods in Balasore, Odisha.

4. CaTRAT (Camera Trap data Repository and Analysis Tool)

CaTRAT (Camera Trap data Repository and Analysis Tool) is an AI-based software used to identify Himalayan snow leopards through camera trap images. It uses artificial intelligence and neural networks to automatically sort species photos. **For tiger monitoring, M-STrIPES uses GPS-based geotagging for photo evidence and ecological tracking.** Lions are monitored using **AI tools like SIMBA, E-GujForest, and an Alert Generation System for real-time surveillance.**

5. Sculptor Galaxy (NGC 253)

Sculptor Galaxy, also called **NGC 253 or Silver Coin Galaxy, is located 7.5 million light-years from Ea**rth. It was discovered **by Caroline Herschel in 1783**. NGC 253 is a large, nearly edge-on spiral galaxy. Observed in detail using MUSE on ESO's Very Large Telescope. **Spiral galaxies are surrounded by halos of old stars, star clusters, and dark matter**. Milky Way and Andromeda are barred spiral galaxies, with **central ribbons of stars, gas, and dust.**

25 JUNE

1. Evaporative demand

Evaporative demand reflects the atmosphere's "thirst" — the potential for evaporation if water is available. It is driven by temperature, wind speed, humidity, and cloud cover, not just water presence. **High evaporative demand contributes to drought, fire danger, and vegetation stress**. Tracking it helps detect drought onset and intensification.

Thirstwave refers to 3+ consecutive days of intense evaporative demand, influenced by multiple atmospheric factors. Thirstwaves are growing in intensity, frequency, and duration due to climate change.

2. Estimates Committee of Parliament

Constituted in 1950, it is a 30-member committee elected annually by Lok Sabha. Ministers cannot be members; **the Chairperson is appointed by the Speaker**. Examines Union Budget estimates to suggest economies, efficiency, reforms, and presentation improvements. **Does not deal with Public Undertakings**. Works year-round and submits reports with recommendations. **Ministries must respond within 6 months; Committee examines responses and submits Action Taken Reports to Lok Sabha**.

3. ASEAN-India Trade in Goods Agreement (AITIGA)

Signed in 2009 in Bangkok; came into force in 2010. **Originated from the 2003 Framework Agreement on Comprehensive Economic Cooperation**. Covers only trade in goods, not services or investments. Tariff elimination on 76.4% of goods; liberalization on over 90%. **Separate provisions for special products (e.g., palm oil, tea, coffee, pepper).** Differentiated timelines for less-developed ASEAN members. Includes sensitive and exclusion lists, non-tariff barrier (NTB) reduction, and dispute settlement mechanisms **A Joint Committee oversees implementation and amendments.**

4. Sustainable Development Report 2025

India ranks in the top 100 for SDG progress for the first time. Global SDG progress has stalled; only 17% targets likely to be met by 2030. Conflicts, fiscal constraints, and structural issues hinder progress. **Finland, Sweden, and Denmark top the SDG Index. East & South Asia have shown highest progress since 2015**. Reversals noted in obesity, press freedom, nitrogen use, biodiversity, and corruption. **Barbados, Jamaica, and Trinidad & Tobago top in UN multilateralism commitment.**

5. NAVYA Initiative

NAVYA – Nurturing Aspirations through Vocational Training for Young Adolescent – is **a joint pilot initiative of the Ministry of Women and Child Development (MWCD) and the Ministry of Skill Development and Entrepreneurship (MSDE).** It targets

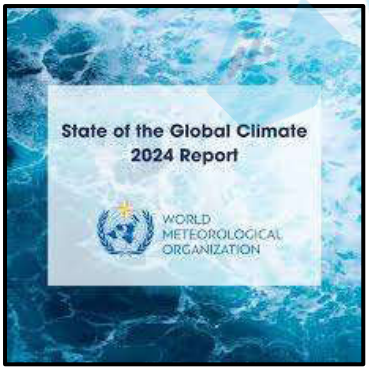
adolescent girls aged 16–18 years with minimum Class 10 education. **Focuses on vocational training in non-traditional job roles**. **Implemented in 27 districts across 19 States, including Aspirational and North-Eastern district**s. Draws support from the **Pradhan Mantri Kaushal Vikas Yojana (PMKVY).** Empowers girls with skills, confidence, and opportunities for a self-reliant, inclusive India.

26 JUNE

1. Sabka Vishwas (Legacy Dispute Resolution) Scheme, 2019 (SVLDRS)

One-time amnesty scheme introduced in Union Budget 2019. Aimed to resolve pending disputes under Service Tax, Central Excise and 26 other Indirect Tax laws subsumed under GST. Operational from Sept 1 to Dec 31, 2019. **Provided 40–70% relief on duty demands (excluding voluntary disclosures). Encouraged voluntary tax disclosure and closure of legacy disputes.** Granted immunity from penalty, interest, and prosecution upon payment of declared dues.

2. State of the Climate in Asia 2024 Report



Published by the **World Meteorological Organisation (WMO),** involving NMHSs, RCCs, UN bodies, and others. **2024 was the hottest year globally (1850–2024); 2015–2024 were the 10 warmest years**. Asia's sea surface warming rate nearly double the global average; sea level rise exceeded global average. **Widespread marine heatwaves since 1993, worst in the northern Indian Ocean, Yellow Sea, and East China Sea**.

Cyclones: 3 in Bay of Bengal, 1 in Arabian Sea. **Saudi Arabia hit 49°C in Makkah during mid-June**.

3. Digital Payment Intelligence Platform (DPIP)

Aims to **enhance fraud risk management through real-time intelligence sharing.** Will involve both public and private sector banks in its institutional structure. **RBIH assigned to build a prototype in consultation with 5–10 banks**. **Committee chaired by A.P. Hota** formed to examine implementation aspects. Leverages advanced technologies to curb payment frauds. Triggered by a rise in fraud cases (from 11.5 lakh to 15.51 lakh in six months). Supports India's growing digital payments ecosystem, especially UPI.

4. Organisation of Islamic Cooperation (OIC)

Second largest intergovernmental organisation after the UN with 57 member states across 4 continents. **Established on 25 September 1969 in Rabat, Morocco**. Aims to preserve Islamic values, defend sovereignty, and promote international peace and security. **Serves as the collective voice of the Muslim world in economic, social, and political matters.**

Official languages: Arabic, English, and French.

Main bodies: Islamic Summit Conference, Council of Foreign Ministers, General Secretariat.

Headquarters: Jeddah, Saudi Arabia.

Partners with UN agencies, governments, and CSOs globally.

5. Enhanced Rock Weathering

Enhanced Rock Weathering (ERW) **accelerates natural weathering to capture and store carbon dioxide (CO_2)**. Uses fast-weathering rocks like basalt, finely ground to increase surface area. **Weathering locks CO_2 from air or soil as bicarbonate, later forming limestone**. Effective rates depend on rock type, climate, soil, and land use. Improves soil alkalinity, aiding crop growth and nutrient levels**. Basalt is abundant and cost-effective. Also reduces CO_2 release from water bodies. Risk:** some rocks may release heavy metals.

27 JUNE

1. The Integrated Biodiversity Assessment Tool (IBAT)

The Integrated Biodiversity Assessment Tool (IBAT) Alliance was founded in 2008 by four major conservation organizations: **BirdLife International, Conservation International, IUCN, and UNEP-WCMC**. In 2024, it invested a record $2.5 million in biodiversity data. IBAT provides authoritative biodiversity data through its platform, aiding global decision-making for governments, businesses, and NGOs. **Key datasets include WDPAs, WDKBA, and IUCN Red List, along with derived datasets like Rarity-Weighted Richness and STAR metric. Headquartered in Cambridge, UK**, it is globally trusted for biodiversity risk assessment and sustainability planning.

2. Tansen

Tansen was a legendary Indian classical musician, composer, vocalist, and instrumentalist who **popularized the plucked rabab**. He **initially served Daulat Khan and later became court musician to King Ramchandra of Bandhavgarh**. Mughal Emperor Akbar appointed him as a Navaratna and honored him with the **title "Mian"**. He is credited with creating ragas like **Miyan ki Malhar, Miyan ki Todi, and Darbari, and was known for Dhrupad compositions**. His grave lies at the protected tomb of Sheikh Muhammad Ghaus in Gwalior.

3. Black Mass Recovery Technology

Black Mass Recovery Technology is **used to extract battery-grade lithium, cobalt, nickel, and manganese from end-of-life lithium-ion batteries**. It uses a dual-mode (wet and dry) process with 97–99% recovery efficiency. **The indigenously developed and patented process includes collection, shredding, leaching, and purification**. Reduces import dependence by recycling critical minerals domestically. Recovered compounds like lithium carbonate meet global standards for domestic use and export. **Black mass is the shredded residue rich in valuable metals used for new battery production.**

4. Tawi River

Tawi River is a **major left-bank tributary of the Chenab River and flows through the Jammu region**. It originates from Kalpas Kund in Bhaderwah (Doda district) and travels 141 km before merging with the Chenab in Pakistan's Punjab**. It is considered sacred and is referred to as "Surya Putri" in ancient texts**. The river divides Jammu city into two—old and new town. It is the main water source for Jammu and has a catchment area of 2168 sq.km. **Tributaries include Bhuteshwari (Birma), Duddhar, and Jajjhar.**

5. Kappatagudda Wildlife Sanctuary

Kappatagudda Wildlife Sanctuary is in **Gadag district, Karnataka**, covering 244.15 sq.km. It hosts diverse habitats**—dry deciduous forests, grasslands, scrublands, and riverine zones—earning it the name "Western Ghats of North Karnataka."** Historical temples and ruins from Chalukya and Rashtrakuta eras are scattered across the area. Architectural sites include **Kappatagudda Jain Basadi, Brahma Jinalaya, Trikuteshwara, and Dambala Temples.**

Flora: Around **400 medicinal plant species.**

Fauna: Includes leopards, hyenas, wolves, jackals, jungle cats, and mongooses.