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PRELIMS

POLITY & GOVERNANCE

SHE-LEAPS: Digital Platform Powering the Lakhpati Didi Mission

Why in News?

The Government of India launched **SHE-LEAPS (Self-Help Entrepreneur–Livelihoods and Enterprise Application for Prosperity and Sustainability)** on **29 June 2026** during the **Rashtriya Gramin Vikas Sammelan** in New Delhi. The platform is designed to digitally empower **Self-Help Group (SHG)** women entrepreneurs and accelerate the **Lakhpati Didi Mission** through real-time enterprise monitoring and data-driven governance.

About SHE-LEAPS

- **Full Form:** Self-Help Entrepreneur–Livelihoods and Enterprise Application for Prosperity and Sustainability.
- A **digital platform** developed by the **Digital India Corporation**.
- Implemented under the **LokOS** platform.
- Supports both **farm and non-farm enterprises** managed by rural SHG women.
- To be rolled out across **34 States and Union Territories** through **State Rural Livelihood Missions (SRLMs)**.

Key Features

- Enables **enterprise creation, profiling, and performance tracking**.
- Captures **real-time livelihood and enterprise data**.
- Digitises records of **SHGs, Village Organisations (VOs), and Cluster Level Federations (CLFs)** through LokOS.
- Improves **financial inclusion**, governance, planning, and policy formulation through data analytics.
- Supports end-to-end monitoring of beneficiaries under the **Lakhpati Didi Mission**.

Ayushman Sarathi: PM-JAY WhatsApp Chatbot for Citizen-Centric Digital Healthcare

Why in News?

The **Union Minister for Health & Family Welfare** launched **Ayushman Sarathi**, a **WhatsApp chatbot** for beneficiaries of **Ayushman Bharat Pradhan Mantri Jan Arogya Yojana (AB PM-JAY)**. Developed by the **National Health Authority (NHA)**, it provides **24×7, API-based access** to PM-JAY services through WhatsApp, improving accessibility and last-mile healthcare delivery.

About Ayushman Sarathi

- A **WhatsApp-based digital chatbot** under **AB PM-JAY**.
- Developed by the **National Health Authority (NHA)** under the **Ministry of Health & Family Welfare**.
- Offers secure, **real-time API integration** with PM-JAY systems.
- Enables citizens to access scheme services without visiting government offices or call centres.

Key Services

- Check **PM-JAY eligibility**.
- Apply for and **download Ayushman Card**.
- Re-do **e-KYC** and link **Aadhaar**.
- Lock/Unlock PM-JAY card.
- Access **Ayushman Vaya Vandana Card (70+ years)** services.

- View treatment history and wallet balance.
- Search nearby **PM-JAY empanelled hospitals**.
- Register, track, or withdraw grievances.
- Request callback support and submit post-discharge feedback.

NAKSHA Project: GIS-Based Urban Land Records Modernisation under DILRMP

Why in News?

The **NAKSHA (NAtional geospatial Knowledge-based land Survey of urban HAbitations) Project** has gained attention as the Government accelerated its implementation and capacity-building efforts to modernise **urban land records** using advanced geospatial technologies under the **Digital India Land Records Modernization Programme (DILRMP)**.

Key Features

- Implemented by the **Department of Land Resources (DoLR), Ministry of Rural Development**.
- A **one-year pilot programme** covering **157 Urban Local Bodies (ULBs)** across **27 States and 3 Union Territories**.
- Objective: Create **accurate, GIS-enabled urban land records** to improve property ownership clarity, reduce disputes, strengthen urban planning, and facilitate transparent property taxation.
- Uses **aerial surveys, drones, GNSS (Global Navigation Satellite System), orthorectified imagery, Web-GIS, and field surveys**.
- Technical partners include:
    - **Survey of India** – aerial surveys and geospatial mapping.
    - **NICSI** – data storage and IT support.
    - **MPSeDC** – Web-GIS platform development.
    - **Five National Centres of Excellence** – capacity building.

Urban Challenge Fund (UCF): Competitive Financing for Next-Generation Urban Infrastructure

Why in News?

The **Urban Challenge Fund (UCF)** was recently in the news after the Union Government informed the **Lok Sabha** that **33 projects** have been approved or accorded **in-principle approval** since the scheme became operational in **April 2026**.

About the Urban Challenge Fund

- A **Centrally Sponsored Scheme (CSS)** under the **Ministry of Housing and Urban Affairs (MoHUA)**.
- Approved to support **transformative, bankable, and reform-oriented urban infrastructure projects** through a **competitive challenge-mode** approach.
- **Operational Guidelines:** Launched on **15 April 2026**.
- **Central Assistance: ₹1 lakh crore** over the mission period.

Key Features

- Encourages **leveraging private investment** and innovative financing instead of relying solely on government grants.
- Focuses on projects with high economic and social impact.
- Supports three major verticals:
    - **Cities as Growth Hubs**
    - **Creative Redevelopment of Cities**
    - **Water and Sanitation** infrastructure.
- Incentivises reforms in **urban planning, governance, and municipal finance**.

Atmanirbhar Panchayat Programme

Why in News?

The **Ministry of Panchayati Raj** launched the **Atmanirbhar Panchayat Programme**, along with the **SAMARTH Panchayat Portal** and **Model Own Source Revenue (OSR) Rules**, to strengthen the financial autonomy of Panchayati Raj Institutions (PRIs) and support the vision of **Viksit Bharat @2047**.

About the Atmanirbhar Panchayat Programme

- **Launched by:** Ministry of Panchayati Raj.
- **Implemented under: Rashtriya Gram Swaraj Abhiyan (RGSA)**.
- **Objective:** Enable **Gram Panchayats** and **Block Panchayats** to identify local assets and untapped opportunities and convert them into **bankable, revenue-generating projects**, thereby enhancing **Own Source Revenue (OSR)**.

Key Features

- Provides **technical assistance** for project identification, feasibility studies, and preparation of bankable proposals.
- Financing through:
  - **Public-Private Partnerships (PPP)**
  - **Corporate Social Responsibility (CSR)**
  - **Bank finance**
  - **Convergence with government schemes**
- **Institutional Partners: NABARD** and **HUDCO**.
- **Project Target: 350 projects** over **4 years** (50 in Year 1 and 100 each in the next three years).

Eligibility

- **Gram Panchayats:** Minimum **Own Source Revenue (OSR) of ₹50 lakh**.
- **Block Panchayats:** Minimum **OSR of ₹1 crore**.
- At least **three years of remaining tenure** (relaxed norms for Special Category States).

Academic Bank of Credits (ABC): Building India's Lifelong Digital Learning Ecosystem

Why in News?

The **Ministry of Education** released a **PIB Backgrounder** highlighting the progress of the **Academic Bank of Credits (ABC)** and **APAAR (Automated Permanent Academic Account Registry)**. The **UGC mandated all Higher Education Institutions (HEIs)** to upload students' academic credit data to the ABC portal by **30 June 2026**, reinforcing implementation of **NEP 2020**.

About Academic Bank of Credits (ABC)

- A **digital repository** established by the **Ministry of Education** and regulated by the **University Grants Commission (UGC)**.
- Introduced under the **National Education Policy (NEP) 2020** to facilitate **academic mobility** and **lifelong learning**.
- Enables students to **store, accumulate, transfer, and redeem** academic credits earned from **recognised Higher Education Institutions (HEIs)**.
- **APAAR (Automated Permanent Academic Account Registry)** serves as the **12-digit unique student ID**, linked with **ABC**, **Aadhaar**, and **DigiLocker** under the **"One Nation, One Student ID"** initiative.

Key Features

- Supports **Multiple Entry and Multiple Exit (MEME)** in higher education.
- Credits remain **valid for up to 7 years** (or as prescribed by the respective discipline).
- Integrated with:

- **National Academic Depository (NAD)**
- **DigiLocker**
- **SWAYAM**
- **National Credit Framework (NCrF)**

- As of **June 2026**:
  - **26.3 crore verified APAAR IDs** generated.
  - Nearly **2,963 institutions** registered on the ABC platform.

PM-YASASVI Scheme

Why in News?

The **Ministry of Social Justice and Empowerment** recently highlighted the progress of the **PM-YASASVI Scheme** in expanding educational opportunities for students belonging to **Other Backward Classes (OBCs), Economically Backward Classes (EBCs), and Denotified, Nomadic & Semi-Nomadic Tribes (DNTs)** through scholarships and hostel assistance.

Key Features of PM-YASASVI

- **PM-YASASVI** stands for **PM Young Achievers Scholarship Award Scheme for Vibrant India**.
- **Nodal Ministry:** Ministry of Social Justice and Empowerment.
- **Objective:** Promote quality education and reduce school/college dropout among socially and educationally disadvantaged groups.
- **Target Beneficiaries:**
  - Other Backward Classes (OBCs)
  - Economically Backward Classes (EBCs)
  - Denotified, Nomadic and Semi-Nomadic Tribes (DNTs)
- The scheme **integrates earlier scholarship components**, including:
  - Pre-Matric Scholarship for OBC, EBC & DNT students.
  - Post-Matric Scholarship for OBC, EBC & DNT students.
  - Top Class School Education for OBC, EBC & DNT students.
  - Hostel facilities for OBC students.
- Scholarships are provided through **Direct Benefit Transfer (DBT)** to ensure transparency and timely disbursal.

Start-up Village Entrepreneurship Programme (SVEP)

Why in News?

The Government recently highlighted the achievements of the **Start-up Village Entrepreneurship Programme (SVEP)**, stating that **over 4.32 lakh rural enterprises** had been supported across the country by **June 2026**. The programme has significantly promoted entrepreneurship among women and socially disadvantaged communities.

About SVEP

- **Launched:** 2016.
- **Implemented under: Deendayal Antyodaya Yojana – National Rural Livelihoods Mission (DAY-NRLM)**.
- **Nodal Ministry:** Ministry of Rural Development.
- **Objective:** Promote **non-farm rural enterprises** by enabling Self-Help Group (SHG) members and rural households to establish sustainable micro-enterprises.

Key Features

- Provides **training, mentoring, financial linkages, and business incubation**.

- Develops **Community Resource Persons for Enterprise Promotion (CRP-EPs)** to handhold entrepreneurs.
- Facilitates access to **bank credit** and community-managed funds.
- Focuses on **local value addition**, employment generation, and reducing rural distress migration.
- As of June 2026:
  - **4.32 lakh+ enterprises** supported.
  - Around **86% of beneficiaries** belong to **SC, ST, OBC, and Minority communities**, reflecting its inclusive approach.

Crime and Criminal Tracking Network & Systems (CCTNS)

Why in News?

The **National Crime Records Bureau (NCRB)** recently assessed states on their **CCTNS performance index**, where **Chhattisgarh scored 64.97/100**, prompting the state government to order a comprehensive overhaul of its digital policing infrastructure. The assessment highlights the importance of CCTNS in improving police efficiency and criminal justice delivery.

About CCTNS

- **Launched:** 2009 as a **Mission Mode Project** under the **National e-Governance Plan (NeGP)**.
- **Nodal Ministry:** Ministry of Home Affairs (MHA).
- **Implementing Agency:** National Crime Records Bureau (NCRB).
- **Objective:** Create a nationwide network connecting police stations for **real-time crime and criminal information sharing**, investigation, and citizen-centric policing.
- As of **February 2026**, **all 17,798 police stations** across India are operational on the CCTNS platform.

Key Features

- Digitisation of **FIRs, complaints, investigations, charge sheets, arrests, and court proceedings**.
- Enables **nationwide search** of crime, criminal, and stolen property records.
- Integrated with the **Inter-Operable Criminal Justice System (ICJS)**, linking **Police, Courts, Prisons, Forensics, Prosecution, and Fingerprint databases**.
- Citizen services include:
  - Online complaint registration
  - FIR status and copies
  - Missing persons search
  - Stolen vehicle/property search
  - Passport and employee verification.

e-Shram Portal: National Database for Unorganised Workers

Why in News?

The **Ministry of Labour and Employment** has further expanded the **e-Shram ecosystem**, with **over 31.78 crore unorganised workers registered as of 14 July 2026**. The latest developments include **dedicated State/UT e-Shram microsites** and the integration of multiple social-security and welfare schemes through the **eShram–One-Stop-Solution**.

Key Facts

- **Launched: 26 August 2021**.
- **Ministry: Ministry of Labour and Employment**.
- **Purpose:** Creation of a **National Database of Unorganised Workers (NDUW)**.
- The database includes **migrant workers, gig workers and platform workers**, among others.

- Registration is based on **self-declaration** and registered workers receive a **Universal Account Number (UAN)**.
- The database is **Aadhaar-seeded** and aims to facilitate the delivery of social-security benefits to vulnerable workers.

Recent Developments

1. eShram–One-Stop-Solution

- Launched on **21 October 2024**.
- Integrates different social-security and welfare schemes on a single platform.
- Workers can access eligible schemes and view benefits availed through the portal.
- As of July 2026, **15 schemes of different Central Ministries/Departments** have been integrated or mapped with e-Shram.

2. State/UT Microsites

- Dedicated **e-Shram microsites** have been developed for States and UTs.
- They help address local requirements and facilitate:
  - Worker registration
  - Data updating
  - Verification
  - State-specific analytics
  - Better targeting of welfare schemes.

3. Linkages with Other Platforms

e-Shram has linkages with:

- **National Career Service (NCS)** → Employment opportunities
- **Skill India Digital Hub (SIDH)** → Skill development
- **PM-SYM** → Pension
- **MoHUA's convergence portal** → Access to relevant urban welfare initiatives.

RajmargYatra: Digital Local Pass & MargMitra

Why in News?

The **National Highways Authority of India (NHAI)** introduced two digital services on the **RajmargYatra app**—**Digital Local Pass** and **MargMitra Help Centre**—to simplify toll services and grievance redressal.

Digital Local Pass

- Available digitally for eligible residents living **within 20 km of an eligible toll plaza**.
- Provides **unlimited crossings through the respective toll plaza during the month**.
- Initially launched at **Mundka–Bakkarwala Toll Plaza**, Urban Extension Road-II (UER-II), Delhi.
- Uses **DigiLocker, VAHAN and GIS-based verification**, eliminating physical documentation.

MargMitra Help Centre

An intelligent digital assistance platform offering:

- FASTag recharge, KYC and refund-status information.
- Annual/Local Pass services and FASTag blacklist status.
- **Complaint registration, real-time tracking and appeal facility**.
- Road-safety reporting, including stalled vehicles and encroachments.
- Supports **22 Indian languages** through text/voice interaction.

INTERNATIONAL RELATIONS

Arctic Council: Governance of the Arctic Region & India's Strategic Engagement

Why in News?

The **Arctic Council** was in the news after discussions on enhancing India's role in Arctic governance, including recommendations for deeper engagement with the Council amid the Arctic's growing geopolitical, environmental, and economic significance.

About the Arctic Council

- Established in **1996** through the **Ottawa Declaration**.
- It is a **high-level intergovernmental forum** for promoting cooperation on **environmental protection, sustainable development, and scientific research** in the Arctic.
- **Military security issues are excluded** from its mandate.
- **Secretariat:** Tromsø, **Norway**.

Membership & Structure

- **Eight Member States:** Canada, Denmark, Finland, Iceland, Norway, Russia, Sweden, and the United States.
- Includes **Permanent Participants** representing Arctic Indigenous communities.
- Non-Arctic countries can participate as **Observers** without voting rights.
- **India became an Observer in 2013** and released its **Arctic Policy (2022)** focusing on science, climate, sustainable development, and international cooperation.

UNCITRAL: The UN's Core Legal Body for Harmonising International Trade Law

Why in News?

India hosted the **60th Anniversary Conference of the United Nations Commission on International Trade Law (UNCITRAL)** in **New Delhi**, where External Affairs Minister **Dr. S. Jaishankar** emphasized the need for **inclusive, transparent, and modern global trade laws** to support emerging technologies, digital commerce, and sustainable economic growth. The conference highlighted India's growing role in shaping international commercial law.

About UNCITRAL

- **Full Form: United Nations Commission on International Trade Law (UNCITRAL)**.
- **Established: 1966** by the **United Nations General Assembly (UNGA)**.
- **Headquarters/Secretariat: Vienna, Austria** (with an office in **New York**).
- **Nature:** Core legal body of the UN for the **harmonisation and modernization of international trade law**.
- **Membership: 70 Member States**, elected by the **UN General Assembly** for **six-year terms**, ensuring equitable geographical representation. (uncitral.un.org)

Objectives & Functions

- Promote **uniformity and predictability** in international commercial transactions.
- **Prepare and update:**
  - Model Laws
  - Conventions
  - Legislative Guides
  - Rules and Technical Assistance

- **Covers areas such as:**
  - International sale of goods
  - Arbitration and mediation
  - Electronic commerce
  - Insolvency law
  - Public procurement
  - Investor–State dispute settlement (ISDS)
  - Micro, Small and Medium Enterprises (MSMEs).

Major UNCITRAL Instruments

- UNCITRAL Model Law on International Commercial Arbitration (1985).
- United Nations Convention on Contracts for the International Sale of Goods (CISG), 1980.
- Model Law on Electronic Commerce (1996).
- Model Law on Cross-Border Insolvency (1997).

ASEAN Regional Forum (ARF): Indo-Pacific's Premier Multilateral Security Dialogue

Why in News?

At the **33rd ASEAN Regional Forum (ARF) Ministerial Meeting** held in **Manila, Philippines**, External Affairs Minister **Dr. S. Jaishankar** reiterated India's policy of **zero tolerance against terrorism**, called for choking terror financing, and stressed the need for a **rules-based maritime order** with safe and unimpeded international waterways in accordance with **UNCLOS**.

About the ASEAN Regional Forum (ARF)

- **Established: 1994**.
- **Nature:** The **oldest and largest ASEAN-led multilateral security dialogue** in the Asia-Pacific and Indo-Pacific regions.
- **Objective:** Promote dialogue, confidence-building, preventive diplomacy, and cooperation on political and security issues.
- **Chair:** The **ASEAN Chair** hosts and chairs the ARF annually.
- **Membership: 27 participants**, comprising:
  - **10 ASEAN Member States**
  - **10 ASEAN Dialogue Partners** (including **India, China, Japan, South Korea, Australia, New Zealand, USA, Russia, Canada, and the EU**)
  - **7 other participants** (Bangladesh, DPRK, Mongolia, Pakistan, Papua New Guinea, Sri Lanka, and Timor-Leste).

Key Areas of Cooperation

- Counter-terrorism and transnational crime
- Maritime security
- Cybersecurity
- Non-proliferation and disarmament
- Disaster relief and humanitarian assistance
- Peacekeeping operations
- Preventive diplomacy and confidence-building measures

State of Food Security and Nutrition in the World (SOFI) 2026

Why in News?

The **State of Food Security and Nutrition in the World (SOFI) 2026 Report**, jointly released by **five UN agencies**, reported a modest decline in global hunger for the third consecutive year. India recorded

significant improvements in reducing undernourishment, though challenges relating to affordability of healthy diets and malnutrition remain.

Key Highlights

- **Published by:** FAO, IFAD, UNICEF, WFP and WHO.
- **Objective:** Assess global progress on **food security, hunger and nutrition** and monitor **SDG-2 (Zero Hunger)**.
- **Global Hunger (2025):**
  - o **645 million people** (7.8% of world population) faced hunger.
  - o Down from **8.1% (2024)** and **8.6% (2022)**.
- Around **2.1 billion people** experienced **moderate or severe food insecurity**.
- **2.69 billion people** could not afford a healthy diet globally.
- **India** recorded a **42% decline in undernourishment** over the past two decades, driven by welfare programmes and improved agricultural productivity, though about **520 million people** still cannot afford a healthy diet.

Falkland Islands: Strategic South Atlantic Archipelago at the Centre of a Sovereignty Dispute

Why in News?

After Argentina's victory over England in the **2026 FIFA World Cup semi-final**, Argentine players displayed a banner stating **"Las Malvinas son Argentinas" (The Malvinas are Argentine)**, reviving the long-standing **Falkland Islands dispute**. The UK urged FIFA to investigate the political message.

Key Facts

- **Falkland Islands/Malvinas:** Archipelago in the **South Atlantic Ocean**, comprising **East Falkland and West Falkland** along with smaller islands.
- **Capital: Stanley**.
- **Present control: United Kingdom**; administered as a **British Overseas Territory**.
- **Claimant: Argentina**, which calls them **Islas Malvinas**.
- The dispute intensified after **Argentina invaded the islands in April 1982**.
- The **Falklands War (1982)** lasted about **10 weeks**, ending with British forces regaining control.
- The dispute remains unresolved despite the end of hostilities.

Strategic Significance

The islands are important because of their **South Atlantic location**, surrounding maritime resources and geopolitical significance. The dispute also intersects with questions of **self-determination, territorial integrity and colonial legacies**.

Operation Southern Readiness 26-2: Maritime Security Cooperation

Why in News?

The **Indian Navy** hosted **Operation Southern Readiness 26-2** at **Southern Naval Command, Kochi**, from **20–23 July 2026**. It was a four-day multinational maritime-security training engagement conducted with the **Combined Maritime Forces (CMF)** under **Combined Task Force 154 (CTF-154)**.

Key Facts

- **Host:** Indian Navy, Southern Naval Command, Kochi.
- **Partner: Combined Maritime Forces (CMF)** — a multinational maritime partnership of **40+ nations**.
- **CTF-154:** CMF's dedicated **Training Task Force**, led by the Indian Navy.
- Training covered:
  - o **Maritime Law**

- Maritime Domain Awareness (**MDA**)
- **Information sharing**
- **Counter-narcotics**
- Force protection and asymmetric threats
- Maritime **uncrewed systems**
- Damage control and firefighting
- Boarding procedures and survival at sea

- Training combined **classroom instruction, simulators and practical onboard training**.

Strategic Significance

The exercise strengthens **interoperability, maritime capacity-building and collective maritime security**, particularly in the wider **Indian Ocean region**. It also highlights **Southern Naval Command, Kochi** as an important hub for professional naval training.

ECONOMY

National Investment and Infrastructure Fund (NIIF)

Why in News?

The **Union Cabinet** approved an **additional investment commitment of ₹30,000 crore** to the **National Investment and Infrastructure Fund (NIIF)**. This raises the Government of India's total commitment to **₹60,000 crore** and will support the launch of **NIIF Infrastructure Fund II**, aimed at mobilising long-term institutional capital for infrastructure and other nationally important sectors.

About NIIF

- Established in **2015** following the **Union Budget 2015–16** announcement.
- A **sovereign-anchored investment platform** managed by **National Investment and Infrastructure Fund Limited (NIIFL)**.
- Registered with **SEBI** as a **Category II Alternative Investment Fund (AIF)**.
- The **Government of India is the anchor investor (49%)**, while the remaining capital is mobilised from domestic and global institutional investors.

Objectives & Fund Structure

- Mobilise long-term capital for **greenfield and brownfield infrastructure projects**.
- Invest in sectors such as:
  - Transportation
  - Energy
  - Digital infrastructure
  - Urban infrastructure
  - Manufacturing and other strategic sectors.
- NIIF currently manages four major investment platforms:
  - Master Fund
  - Private Markets Fund
  - Strategic Opportunities Fund
  - India–Japan Fund.

BHAVYA Rasayan Scheme

Why in News?

The **Union Cabinet** has approved the **Bharat Audyogik Vikas Yojana Rasayan (BHAVYA Rasayan)** Scheme to establish **three dedicated Chemical Parks** across India. Announced in the **Union Budget 2026–27**, the scheme aims to strengthen domestic chemical manufacturing, reduce import dependence, and improve global competitiveness.

Key Features of the Scheme

- **Full Form: Bharat Audyogik Vikas Yojana Rasayan (BHAVYA Rasayan)**.
- **Nodal Ministry: Department of Chemicals & Petrochemicals**, Ministry of Chemicals & Fertilizers.
- **Type: Central Sector Scheme**.
- **Implementation Period: FY 2026–27 to FY 2030–31 (5 years)**.
- **Financial Outlay: ₹3,030 crore**
  - ₹3,000 crore for common infrastructure.
  - ₹30 crore for administrative expenditure.

- The Centre will provide **up to ₹1,000 crore per Chemical Park**, subject to a **minimum ₹500 crore contribution by the respective State Government**.

Objectives & Significance

- Develop **world-class plug-and-play infrastructure** for chemical industries.
- Create common facilities such as:
  - Common Effluent Treatment Plants (CETPs)
  - Hazardous Waste Management Systems
  - Utilities and logistics infrastructure.
- Promote **upstream, downstream, and ancillary industries**.
- Enhance exports, attract domestic and foreign investment, generate employment, and support **Atmanirbhar Bharat** through sustainable industrial development.

Portfolio Management Services (PMS)

Why in News?

The **Securities and Exchange Board of India (SEBI)** has released a **consultation paper** proposing a comprehensive overhaul of the **SEBI (Portfolio Managers) Regulations, 2020**. The reforms aim to enhance investor protection, expand investment opportunities, improve transparency, and facilitate ease of doing business in the rapidly growing PMS industry.

What is Portfolio Management Service (PMS)?

- **Portfolio Management Service (PMS)** is a **professional investment management service** in which a SEBI-registered portfolio manager manages an investor's portfolio of securities according to agreed investment objectives.
- It is primarily designed for **High Net Worth Individuals (HNIs)**.
- **Regulator:** Securities and Exchange Board of India (SEBI).
- **Current minimum investment: ₹50 lakh** under the existing PMS framework.

Key Proposed Reforms

- Introduction of a new **Mutual Fund-only PMS (MF-PMS)** category with a **minimum investment of ₹25 lakh**.
- Allow portfolio managers to invest in:
  - Overseas listed securities.
  - Unlisted debt securities.
  - Securities proposed to be listed.
- Relax compliance requirements for smaller portfolio managers.
- Enhance disclosure norms, fee transparency, governance, and risk management.
- Permit greater flexibility in the use of derivatives within prescribed limits.

Mission Golden Spice – Integrated Lakadong Turmeric Value Chain Enhancement Project

Why in News?

The **Ministry of Development of North Eastern Region (MDoNER)** launched **Mission Golden Spice – Integrated Lakadong Turmeric Value Chain Enhancement Project** in Meghalaya with an outlay of **₹175.45 crore**. It is a **five-year initiative (2025–30)** to develop Lakadong turmeric as a premium global spice.

Key Features

- **Product:** Meghalaya's **GI-tagged Lakadong Turmeric**.
- **Curcumin content:** Around **7–10%**, significantly higher than ordinary turmeric.
- **Coverage:** Cultivation, processing, branding, certification, cold chain and market linkages.

- **Target:** Increase cultivation area from about **2,500 ha to 7,500 ha** and farmer returns from **₹30–40/kg to nearly ₹80/kg** by 2030.
- Plans include the **North-East's largest integrated organic turmeric processing and curcumin-extraction facility**.
- **Women farmers** and farmer institutions are central to the value chain.

Institutional Convergence

Anchored by **MDoNER and North Eastern Council (NEC)**, with support from **APEDA, Spices Board, National Turmeric Board, ICAR, NABARD, SFAC** and relevant ministries.

Electronic Gold Receipts (EGRs): SEBI-Regulated Digital Ownership of Physical Gold

Why in News?

Electronic Gold Receipts (EGRs) were in the news after the **National Stock Exchange (NSE)** partnered with **Augmont Enterprises** to expand the EGR ecosystem and deepen India's exchange-traded spot gold market. The initiative aims to improve transparency, liquidity, and price discovery in gold trading.

Key Facts

- **Electronic Gold Receipts (EGRs)** are **dematerialised securities** representing ownership of **physical gold** stored in **SEBI-accredited vaults**.
- **Regulator: Securities and Exchange Board of India (SEBI)**.
- **Legal Status:** Recognised as **"securities"** under the **Securities Contracts (Regulation) Act, 1956 (SCRA)**.
- **Framework Introduced:** SEBI's **Gold Exchange Framework (2022)**.
- **How EGRs Work:**
  - Physical gold meeting prescribed purity standards is deposited with a **SEBI-registered Vault Manager**.
  - The gold is verified, securely stored, and corresponding **EGRs are credited to the investor's Demat account**.
  - EGRs can be **bought and sold on stock exchanges** like other securities.
  - Investors can **convert EGRs back into physical gold** by surrendering the receipts.
- **Advantages:**
  - Assured purity and standardisation.
  - Eliminates storage and theft risks.
  - Transparent price discovery through exchange trading.
  - Enhances liquidity and formalises the gold market.
  - Facilitates a **national spot gold exchange**.

Investment Friendliness Index (IFI) 2026: Benchmarking States for Investment Readiness

Why in News?

The **Investment Friendliness Index (IFI) 2026**, the **first-ever national index** released by **NITI Aayog**, ranked **Gujarat** as India's most investment-friendly state, followed by **Maharashtra** and **Tamil Nadu**. The index aims to assess and improve the investment ecosystem across States and Union Territories while fostering **competitive cooperative federalism**.

Key Facts

- **Released by: NITI Aayog**.
- **Announced in: Union Budget 2025–26**.
- **Objective:**
  - Assess the investment climate across States and UTs.

- Encourage reforms to attract domestic and foreign investment.
- Provide investors with a data-driven assessment of investment destinations.

- **Assessment Framework:** Based on two broad dimensions:
  - **Opportunity** (availability of skilled manpower, infrastructure, market potential, industrial ecosystem, etc.).
  - **Risk** (governance quality, regulatory certainty, financial health, policy stability, compliance burden, etc.).
- **Top Performing States (2026):**

Gujarat, Maharashtra, Tamil Nadu, Goa, Odisha

- The index is intended as a **reform-oriented tool**, enabling States to identify policy gaps and strengthen investment facilitation.

GEOGRAPHY

Himayat Sagar Lake: Historic Reservoir Safeguarding Hyderabad's Water Security

Why in News?

The **Hyderabad Metropolitan Water Supply and Sewerage Board (HMWSSB)** released around **1,000 cusecs of water** from **Himayat Sagar Lake** after the reservoir received heavy inflows due to intense monsoon rainfall. Authorities issued flood alerts for downstream areas along the **Esi River**.

About Himayat Sagar Lake

- An **artificial reservoir** located in **Ranga Reddy district, Telangana**, about **20 km southwest of Hyderabad**.
- Constructed across the **Esi River**, a **tributary of the Musi River**.
- **Construction:** Began in **1920** and completed in **1927** during the reign of **Mir Osman Ali Khan (Nizam VII)**.
- Named after **Himayat Ali Khan**, the eldest son of the last Nizam.
- Built primarily for:
    - o Flood control following the **1908 Musi floods**.
    - o Supplying drinking water to **Hyderabad and Secunderabad**.
- Lies parallel to the **Osman Sagar** reservoir, which is built across the **Musi River**.

Mount Erebus: Antarctica's Active Volcano Emitting Gold-Rich Volcanic Gases

Why in News?

Mount Erebus, Antarctica's southernmost active volcano, was in the news after reports highlighted that it continuously releases **volcanic gases containing microscopic gold particles**, estimated to be worth over **US$2 million annually**. The phenomenon has renewed interest in Antarctica's unique volcanic and geological systems.

About Mount Erebus

- Located on **Ross Island** in **Antarctica**.
- **Elevation:** Approximately **3,794 metres**, making it the **second-highest volcano in Antarctica** after **Mount Sidley**.
- It is the **southernmost active volcano on Earth**.
- First discovered in **1841** by British explorer **Sir James Clark Ross**, who named it after his ship **HMS Erebus**.
- Known for hosting one of the **world's few persistent lava lakes**, which has remained active for decades.

Geological Features

- A **stratovolcano (composite volcano)** formed by successive layers of lava, ash, and volcanic debris.
- Part of the **McMurdo Volcanic Group** within the **West Antarctic Rift System**.
- Emits gases rich in **water vapour, carbon dioxide, sulphur dioxide**, and trace quantities of **gold crystals** carried in volcanic plumes.
- The gold particles are extremely fine (microscopic) and disperse over vast distances, making commercial extraction impractical.

Crete Island: Mediterranean Geography & Climate Extremes

Why in News?

Crete Island, Greece's largest island, was in the news after **massive wildfires** triggered by prolonged heatwaves, dry conditions, and strong winds forced the evacuation of thousands of residents and tourists. The incident highlights the increasing frequency of climate-induced disasters in the Mediterranean region.

Geographical Profile

- **Crete** is the **largest and southernmost island of Greece**, located in the **eastern Mediterranean Sea**.
- It lies between the **Aegean Sea (north)** and the **Libyan Sea (south)**, acting as a bridge between **Europe, Asia, and Africa**.
- Capital: **Heraklion**.
- Characterised by rugged mountains, including the **White Mountains (Lefka Ori)** and **Mount Ida (Psiloritis)**, the highest peak on the island.
- Experiences a **Mediterranean climate**—hot, dry summers and mild, wet winters.

Environmental Significance

- Mediterranean ecosystems are **highly vulnerable to wildfires** due to dry summers, flammable vegetation, and seasonal winds.
- Rising temperatures and prolonged droughts linked to **climate change** have increased the intensity and frequency of wildfires across Southern Europe.
- Crete hosts rich biodiversity, olive groves, vineyards, and important tourism-based ecosystems.

Cloudburst: Extreme Rainfall Phenomenon & Disaster Risk in the Himalayas

Why in News?

Cloudbursts were recently in focus following extreme rainfall events and flash floods in parts of the Himalayan region. The discussion has renewed attention on the scientific definition, causes, and increasing frequency of cloudbursts amid changing climate patterns.

What is a Cloudburst?

- A **cloudburst** is a **highly localized, extremely intense rainfall event**, defined by the **India Meteorological Department (IMD)** as **10 cm (100 mm) or more rainfall within one hour** over an area of roughly **10 km × 10 km**.
- It often results in **flash floods, landslides, and debris flows**, particularly in mountainous terrain.

Causes & Characteristics

- Triggered by **cumulonimbus clouds** carrying large amounts of moisture.
- Orographic lifting over mountains forces warm, moisture-laden air to rise rapidly, causing intense condensation.
- Strong updrafts delay raindrop fall until clouds release enormous quantities of water within a short duration.
- Common in the **Himalayan region**, Western Ghats, and other areas with steep topography.

Japan: Seismic Vulnerability, Plate Tectonics and Disaster Preparedness

Why in News?

A powerful **earthquake struck Kumamoto Prefecture on Kyushu Island, southern Japan**, triggering tsunami concerns and extensive rescue operations. The event has again highlighted Japan's exceptional exposure to seismic hazards and its advanced earthquake-resilience systems.

Japan: Geographical Significance

- **Location:** East Asia; an island country in the **Pacific Ocean**.
- **Major islands: Honshu, Hokkaido, Kyushu and Shikoku**.
- **Capital:** Tokyo.
- Lies within the **Pacific Ring of Fire**, making it highly prone to earthquakes and volcanic activity.

- Major tectonic plates influencing Japan include the **Pacific Plate, Philippine Sea Plate, Eurasian/Amur Plate and Okhotsk Plate**.
- **Subduction zones** around Japan generate frequent earthquakes, tsunamis and volcanic activity.

Key Disaster-Management Features

Japan has developed:

- Strict **earthquake-resistant building standards**
- Earthquake and tsunami **early-warning systems**
- Regular disaster-preparedness drills
- **Seismic isolation and damping technologies**
- Evacuation infrastructure and public awareness mechanisms.

Kalpasar Project

Why in News?

The **Kalpasar Project** was back in the news after the Government of Gujarat announced that the project is expected to **halve the travel distance between Bhavnagar and Surat** while significantly enhancing water security and regional connectivity. The project has also gained momentum following **India–Netherlands technical cooperation** on water management and coastal engineering.

About the Kalpasar Project

- **Kalpasar** stands for **"Kalp + Sarovar"**, meaning a reservoir capable of fulfilling future needs.
- Also known as the **Gulf of Khambhat Development Project**.
- Proposed by the **Government of Gujarat**.
- Envisages construction of a **sea dam across the Gulf of Khambhat (Cambay)** to create one of the **world's largest freshwater coastal reservoirs**.

Key Features

- Stores surplus water from rivers such as the **Narmada, Mahi, Sabarmati, and Dhadhar**.
- Aims to provide:
  - Irrigation for water-scarce **Saurashtra and North Gujarat**.
  - Drinking and industrial water supply.
  - Prevention of **salinity ingress**.
  - Improved groundwater recharge.
- Includes a **road-cum-dam corridor**, reducing the **Bhavnagar–Surat** travel distance by nearly half.
- The **Bhadbhut Barrage** on the Narmada River is an integral component of the project.

Tanzania: India's Strategic Partner in East Africa and the Western Indian Ocean

Why in News?

India and **Tanzania** recently reviewed their bilateral relations across **trade, defence, maritime security, health, education, digital technology, and capacity building**. The discussions reaffirmed the growing strategic partnership between the two countries under India's engagement with Africa and the **Global South**.

About Tanzania

- **Location:** East Africa, on the **Indian Ocean** coast.
- **Capital: Dodoma** (administrative); **Dar es Salaam** is the principal commercial city and major port.
- **Formation:** Created in **1964** through the union of **Tanganyika** and **Zanzibar**.
- **Neighbouring Countries:** Kenya, Uganda, Rwanda, Burundi, Democratic Republic of the Congo (across **Lake Tanganyika**), Zambia, Malawi, and Mozambique.
- **Highest Peak: Mount Kilimanjaro (5,895 m)** – Africa's highest mountain.

- **Major Lakes:** Lake Victoria, Lake Tanganyika, and Lake Nyasa (Lake Malawi).
- **Major National Parks:** Serengeti National Park, Ruaha National Park, and Nyerere National Park.
- **Official Languages:** Swahili (Kiswahili) and English.
- **Currency:** Tanzanian Shilling (TZS).

Karlapat Bauxite Block

Why in News?

The **Karlapat Bauxite Block** in **Odisha** has attracted interest from several leading industrial groups due to its vast untapped reserves and strategic importance for India's expanding aluminium industry. The block is being auctioned after prolonged legal and environmental delays.

About Karlapat Bauxite Block

- **Location:** Kalahandi district, Odisha.
- It is a **greenfield mining block**, meaning it has **not been commercially mined earlier**.
- Estimated **bauxite resource: ~207 million tonnes**, comprising:
  - **153 million tonnes** of proved reserves. o
  - **54 million tonnes** of possible reserves.
- Covers about **9.6 sq. km** with an average ore thickness of nearly **12 metres**.
- Ore contains about **45.2% alumina** with **low silica content**, making it suitable for efficient alumina extraction through the **Bayer Process**.

Importance of Bauxite

- **Bauxite** is the **only commercial ore of aluminium**.
- Aluminium is widely used in **transport, power, construction, aerospace, packaging, defence, and renewable energy**.
- Odisha possesses nearly **41% of India's bauxite resources**, with major deposits in **Koraput, Kalahandi, Rayagada, Kandhamal, Malkangiri, Balangir, Kendujhar, and Sundargarh**.

Chenab River: A Strategic Transboundary River in the Indus Basin

Why in News?

India rejected Pakistan's allegations that it deliberately created a flood-like situation by increasing the flow of the **Chenab River**, stating that the surge was caused by **intense monsoon rainfall** over Jammu and adjoining catchment areas, leading to a natural rise in river discharge.

About the Chenab River

- The **Chenab** is one of the **western rivers** of the **Indus River System**.
- It originates from the confluence of the **Chandra** and **Bhaga** rivers at **Tandi**, in **Lahaul-Spiti district, Himachal Pradesh**.
- It flows through **Himachal Pradesh**, **Jammu & Kashmir (UT)**, and enters **Pakistan**, where it eventually joins the **Indus River**.
- **Length:** Approximately **960 km**.
- Major tributaries include:
  - **Marusudar**
  - **Tawi**
  - **Ujh**
- It is one of the **largest contributors of water to the Indus Basin**.

Strategic Importance

- The Chenab has significant **hydroelectric potential** and hosts major projects such as:
  - **Baglihar Hydroelectric Project**

- **Salal Hydroelectric Project**
- **Ratle Hydroelectric Project**
- **Pakal Dul Project**
- **Kiru and Kwar Hydroelectric Projects**

• Under the **Indus Waters Treaty (1960)**, the **western rivers (Indus, Jhelum, Chenab)** were allocated primarily to Pakistan, while India retains **limited rights** for **run-of-the-river hydropower, irrigation, and domestic use**.

Black Sea: A Strategic Inland Sea at the Crossroads of Europe and Asia

Why in News?

India issued a **security advisory** for Indian-flagged vessels operating in the **Black Sea** amid escalating regional security concerns and risks to commercial shipping. The advisory highlights the geopolitical significance of the Black Sea as a major maritime trade corridor connecting Europe and Asia.

About the Black Sea

- The **Black Sea** is a **semi-enclosed inland sea** situated between **Eastern Europe** and **Western Asia**.
- It is connected to:
  - **Mediterranean Sea** through the **Bosporus Strait → Sea of Marmara → Dardanelles Strait**.
  - **Sea of Azov** through the **Kerch Strait**.
- It is one of the world's **largest anoxic (oxygen-deficient deep-water) basins**, with most marine life confined to the oxygen-rich upper layers.

Bordering Countries

The Black Sea is bordered by **six countries**:

- **Turkey** (south), **Bulgaria** (west), **Romania** (west), **Ukraine** (north), **Russia** (northeast), **Georgia** (east)

Major Rivers Draining into the Black Sea

- **Danube** (Europe's second-longest river)
- **Dnieper, Dniester, Don** (through the Sea of Azov), **Southern Bug**

Strategic Importance

- Forms a vital maritime corridor linking **Europe, the Caucasus, and Central Asia**.
- Crucial for the export of **grain, crude oil, natural gas, and other commodities**.
- Hosts important ports such as **Odesa (Ukraine), Novorossiysk (Russia), Constanța (Romania), and Varna (Bulgaria)**.
- The **Montreux Convention (1936)** governs the passage of naval vessels through the **Bosporus and Dardanelles**, with Turkey controlling these strategic straits.

Salal Dam / Salal Hydroelectric Project

Why in News?

Amid **heavy rainfall in the Reasi district of Jammu & Kashmir**, authorities opened **all gates of the Salal Dam** after a sharp rise in water inflow into the reservoir and the Chenab River. The move was undertaken to regulate the increased water level and manage the heavy inflow.

Key Facts

- **Name:** Salal Hydroelectric Project
- **River: Chenab**
- **Location: Reasi district, Jammu & Kashmir**
- **Type: Run-of-the-River (RoR) hydropower project**
- **Installed Capacity: 690 MW**
- **Operator: NHPC Limited**

- **Units:** 6 × 115 MW
- **Commissioned:** In stages between **1987 and 1995**.

Salal Dam & Indus Waters Treaty (IWT)

The **Chenab is one of the three Western Rivers** under the **Indus Waters Treaty, 1960**, along with the **Indus and Jhelum**.

Under the original treaty framework:

- **Eastern Rivers:** Ravi, Beas and Sutlej → allocated for India's unrestricted use.
- **Western Rivers:** Indus, Jhelum and Chenab → allocated primarily to Pakistan.
- India is permitted specified uses of the Western Rivers, including **hydroelectric power generation through run-of-the-river projects**, subject to treaty design and operational provisions.

What is a Run-of-the-River Project?

A **run-of-the-river (RoR) hydropower project** generates electricity largely from the **natural flow and elevation gradient of a river**, with comparatively limited water storage compared with large storage dams.

Māori: Indigenous Polynesian People of New Zealand

Why in News?

The **Māori** were in the news during **Prime Minister Narendra Modi's visit to New Zealand**, where he referred to the Māori concept of **"Waka"** while addressing the Indian diaspora and received a traditional **Haka** welcome, highlighting the growing cultural dimension of India–New Zealand relations.

Key Facts

- **Māori** are the **indigenous Polynesian people** of **New Zealand (Aotearoa)**.
- Their ancestors are believed to have arrived from **Eastern Polynesia** in large ocean-going canoes (**Waka**) during the **13th century CE**.
- Around **86% of Māori** live on the **North Island**, while the remainder reside mainly on the South Island.
- They constitute **about one-sixth of New Zealand's population**.
- **Language: Te Reo Māori** is one of the **official languages of New Zealand**, along with English and New Zealand Sign Language.
- **Marae:** A sacred communal meeting place that serves as the centre of Māori social, cultural, and religious life.
- **Haka:** A traditional ceremonial dance performed to express unity, respect, celebration, or challenge; it is internationally associated with New Zealand's **All Blacks** rugby team.
- **Ta Moko:** Traditional Māori tattoo art representing ancestry, identity, genealogy, and social status.
- **Treaty of Waitangi (1840):** Signed between the **British Crown** and Māori chiefs; regarded as New Zealand's founding constitutional document.

ENVIRONMENT AND ECOLOGY

Hargila (Greater Adjutant Stork): Assam's Community-Led Conservation Success Story

Why in News?

During the **135th edition of Mann Ki Baat**, the Prime Minister highlighted the remarkable conservation efforts of Assam's **"Hargila Army"**, a women-led grassroots movement that transformed the **Hargila (Greater Adjutant Stork)** from a bird once considered a bad omen into a symbol of community pride and biodiversity conservation.

About the Hargila Bird

- **Common Name:** Greater Adjutant Stork (locally called **Hargila**, meaning "bone swallower").
- **Scientific Name:** *Leptoptilos dubius*.
- One of the **largest stork species** in the world and an important **scavenger**, helping maintain ecosystem health by feeding on carcasses and organic waste.
- **Habitat:** Wetlands, shallow lakes, floodplains, freshwater marshes, and flooded forests.
- **Distribution:** Found mainly in **Assam** and **Bihar** in India, with small populations in **Cambodia**.
- Breeds during the **winter season** in colonies, often alongside other large waterbirds.

Conservation Status

- **IUCN Red List: Endangered**
- **CITES:** Appendix II
- **Wildlife (Protection) Act, 1972: Schedule IV**
- Major threats include **loss of wetlands**, felling of nesting trees, pollution, and human disturbance.

White-rumped Vulture: India's Critically Endangered Scavenger Facing Electrocution Threats

Why in News?

A **GPS/radio-tagged White-rumped Vulture** died due to **electrocution** after colliding with an overhead power line near **Mudumalai Tiger Reserve** in the **Nilgiris (Tamil Nadu)**. The bird, part of a captive-breeding and reintroduction programme, had been released earlier in 2026. The incident has renewed concerns over **uninsulated power lines** in critical vulture habitats.

About the White-rumped Vulture

- **Scientific Name:** *Gyps bengalensis*.
- Also known as the **Oriental White-backed Vulture**.
- An **Old World vulture** native to **South Asia**.
- Habitat: Open plains, agricultural landscapes, forest fringes, villages, and wooded areas.
- Diet: **Obligate scavenger**, feeding primarily on livestock carcasses and playing a vital role in ecosystem sanitation.

Conservation Status

- **IUCN Red List: Critically Endangered (CR)**
- **CITES:** Appendix II
- **Wildlife (Protection) Act, 1972: Schedule I**
- Major threats:
  - Veterinary **Diclofenac** poisoning (principal cause of population collapse)
  - Electrocution and collision with power lines
  - Habitat degradation

- Food scarcity and poisoning.

Aldabra Giant Tortoise: Seychelles' Iconic Long-Lived Reptile and a Global Conservation Symbol

Why in News?

The **Aldabra Giant Tortoise** was in the spotlight during **Prime Minister Narendra Modi's State Visit to Seychelles**, where he visited the **Giant Tortoise Enclosure** at the **Seychelles National Botanical Garden**. The visit highlighted the ecological significance of the species and its long-standing conservation and cultural link with India.

About the Aldabra Giant Tortoise

- **Scientific Name:** *Aldabrachelys gigantea*.
- One of the **largest and longest-living land tortoise species** in the world, with many individuals living **over 150 years**, and some exceeding **200 years**.
- **Endemic** to the **Aldabra Atoll** in Seychelles.
- Herbivorous, feeding mainly on grasses, leaves, shrubs, and fruits.
- Adult males can weigh **over 250 kg**, making them among the heaviest living tortoises.

Conservation & Ecological Importance

- **IUCN Red List: Vulnerable (VU)**.
- **CITES:** Appendix II.
- **Habitat:** Tropical scrub forests, coastal grasslands, and mangrove ecosystems.
- The **Aldabra Atoll** is a **UNESCO World Heritage Site (1982)** and supports the world's largest wild population of Aldabra giant tortoises.
- Historically, giant tortoises disappeared from many Indian Ocean islands, but Aldabra's isolated location enabled their survival.

Malvi Camel: A Rare Indigenous Breed Facing Extinction

Why in News?

The **Malvi camel**, one of India's **nine recognised camel breeds**, is facing a serious threat of extinction. According to the **2019 Livestock Census**, only about **102 Malvi camels** remain. The **National Research Centre on Camel (NRCC)** has therefore initiated a scientific breeding and conservation programme.

About Malvi Camel

- **Distribution:** Primarily the **Malwa region of Madhya Pradesh**—Mandsaur, Neemuch, Ratlam and Gwalior—and adjoining parts of **Rajasthan** such as Kota, Bundi, Jhalawar and Baran.
- **Appearance:** Known for its distinctive **white/light-coloured coat**; considered the **smallest among India's camel breeds**.
- **Utility:** Traditionally used for **transport and draught purposes**; also valued for **milk production**.
- **Adaptation:** Suited to the semi-arid conditions of the Malwa region.

Conservation Measures

- **NRCC** has procured **12 Malvi camels (3 males and 9 females)**.
- Focus is on **pure breeding** to preserve the breed's genetic identity and increase population.
- Declining traditional utility and changing socio-economic conditions are major threats.

Microporellus kolhapurensis: Newly Discovered Polypore Fungus from the Western Ghats

Why in News?

A **new species of polypore (bracket) fungus**, **Microporellus kolhapurensis**, has been discovered in **Bhudargad taluka of Kolhapur district, Maharashtra**. The discovery, published in **Nelumbo**, the journal of the **Botanical Survey of India (BSI)**, highlights the rich but understudied fungal diversity of the **Western Ghats**, a global biodiversity hotspot.

About *Microporellus kolhapurensis*

- Belongs to the **Microporellus** genus of **polypore (bracket) fungi**.
- **Discovered in:** Bhudargad taluka, Kolhapur district, Maharashtra.
- **Habitat:** Found growing on **rotting wood** in forest ecosystems.
- **Nature:** A **saprotrophic fungus**, obtaining nutrients by decomposing dead organic matter and recycling nutrients.
- **Fruiting Season: July to September**; usually grows **singly**.
- Distinctive features include:
    - Yellowish-orange to greyish-brown colour
    - Umbrella-shaped fruiting body
    - Lateral stalk
    - Large pores
    - Teardrop-shaped spores
    - Thick-walled cystidia.

About Polypore (Bracket) Fungi

- Characterised by **numerous pores** on the underside of the fruiting body instead of gills.
- Commonly grow on **living trees, dead logs, or decaying wood**.
- Play a vital ecological role in **wood decomposition** and **nutrient cycling**.
- Some species are tree pathogens, while others accelerate forest regeneration through decomposition.

Interplanetary Coronal Mass Ejections (ICMEs): Solar Plasma Storms Driving Space Weather

Why in News?

Indian astrophysicists have uncovered new insights into the **thermal evolution of Interplanetary Coronal Mass Ejections (ICMEs)** as they travel from the Sun to Earth. The study explains how the thermal properties of ICMEs influence their ability to trigger **geomagnetic storms**, affecting satellites, GPS, aviation, radio communication, and power grids.

About Interplanetary Coronal Mass Ejections (ICMEs)

- **ICMEs** are **Coronal Mass Ejections (CMEs)** that have propagated into **interplanetary space** after erupting from the Sun's **corona**.
- They consist of **billions of tonnes of magnetized plasma** (electrons, protons, and embedded magnetic fields).
- When Earth-directed, they interact with the **magnetosphere**, producing **geomagnetic storms** and spectacular **auroras**.
- ICMEs occur more frequently during the **solar maximum** of the Sun's **11-year solar cycle**.
- They are among the **strongest drivers of space weather** and serve as natural laboratories for studying plasma physics.

Impacts on Earth

- Disrupt **GPS and radio communications**.
- Affect **satellite operations** and navigation systems.
- Influence **aviation routes**, especially over polar regions.
- Induce currents that can damage **power transmission grids**.
- Generate **geomagnetic storms** and **polar auroras**.

Methane Emissions from Rice Cultivation

Why in News?

A recent **Nature Food** study has identified **India's irrigated rice fields** among the world's largest methane emission hotspots. The study highlighted that greenhouse gas emissions from global paddy cultivation have nearly doubled since the 1960s, raising concerns over balancing food security with climate commitments.

Key Facts

- **Methane (CH_4)** is the **second most important anthropogenic greenhouse gas** after carbon dioxide.
- It has a **Global Warming Potential (GWP)** about **28 times greater than CO_2 over a 100-year period**.
- In flooded paddy fields, **anaerobic (oxygen-deficient) conditions** promote methanogenic microbes that release methane.
- India's irrigated paddy fields emit around **3.9 million tonnes of methane annually**, making them among the world's largest methane sources.
- Major anthropogenic methane sources include:
  - Rice cultivation
  - Livestock (enteric fermentation)
  - Landfills
  - Fossil fuel extraction and transport
  - Wastewater treatment

National Chambal Sanctuary

Why in News?

The **Supreme Court** directed authorities to initiate stringent action, including preventive detention against those facilitating **illegal sand mining** in and around the **National Chambal Sanctuary**, citing severe threats to endangered aquatic wildlife and the fragile river ecosystem.

About National Chambal Sanctuary

- Also known as **National Chambal Gharial Wildlife Sanctuary**.
- **Established:** 1979.
- **Type:** Riverine Protected Area.
- **Location:** Along the **Chambal River**, jointly managed by **Rajasthan, Madhya Pradesh, and Uttar Pradesh**—India's **only tri-state riverine sanctuary**.
- Covers nearly **5,400 sq. km** over about **600 km** of the Chambal River.

Ecological Significance

- One of the last undisturbed river ecosystems in northern India.
- Important habitat for:
  - **Gharial (Critically Endangered – IUCN)**
  - **Gangetic River Dolphin (Endangered)**
  - **Indian Skimmer (Endangered)**
  - **Red-crowned Roofed Turtle (Critically Endangered)**
  - Mugger Crocodile and Smooth-coated Otter.

Bornadi Wildlife Sanctuary

Why in News?

The **Bornadi (Barnadi) Wildlife Sanctuary** in Assam has recorded the **return of the endangered Dhole (Asiatic Wild Dog)** after several years through camera-trap evidence. The sighting is considered a

positive indicator of habitat restoration and improved ecological connectivity in the Eastern Himalayan landscape.

About Bornadi Wildlife Sanctuary

- **Location: Udalguri and Baksa districts**, Assam, along the **Indo-Bhutan border** in the Himalayan foothills.
- **Established: 1980**.
- **Area: 26.22 sq. km**, making it one of Assam's smallest wildlife sanctuaries.
- Named after the **Bornadi River**, which forms its western boundary.
- Established primarily for the conservation of:
  - **Pygmy Hog** (*Porcula salvania*)
  - **Hispid Hare** (*Caprolagus hispidus*)

Biodiversity Significance

- Forms part of the **Greater Manas Landscape**, enhancing wildlife connectivity with Bhutan.
- Important fauna include:
  - **Dhole (Cuon alpinus)** – *Endangered* (IUCN)
  - Golden Langur
  - Clouded Leopard
  - Hoolock Gibbon
  - White-winged Wood Duck
  - Bengal Florican
  - Hornbills and several migratory bird species.

Kuldiha Wildlife Sanctuary: An Important Elephant Corridor in the Similipal Landscape

Why in News?

A **26-year-old farmer** was critically injured in a suspected **leopard attack** inside **Kuldiha Wildlife Sanctuary** in Odisha after entering the forest to retrieve his cattle. The incident has once again highlighted the growing challenge of **human–wildlife conflict** in ecologically sensitive protected areas.

About Kuldiha Wildlife Sanctuary

- **Location: Balasore district, Odisha**, in the **Eastern Ghats**.
- **Established: 1984**.
- **Area: 272.75 sq. km**.
- Forms part of the **Mayurbhanj Elephant Reserve**.
- Connected to **Similipal Tiger Reserve** through the **Sukhupada** and **Nato hill ranges**, serving as a crucial wildlife corridor.
- Declared an **Eco-Sensitive Zone (ESZ)** by the Ministry of Environment, Forest and Climate Change (MoEFCC).

Biodiversity

- **Forest Type:** Tropical moist and dry deciduous forests dominated by **Sal (Shorea robusta)**, bamboo, and other mixed deciduous species.
- **Major Fauna:**
  - Asian Elephant
  - Leopard
  - Gaur (Indian Bison)
  - Malabar Giant Squirrel
  - Barking Deer

- Wild Boar
- Giant Flying Squirrel

- Rich avifauna includes **Hornbills, Hill Mynas, Peafowl**, and numerous migratory birds.

Aerosols: Tiny Atmospheric Particles with a Major Role in Climate and Weather

Why in News?

A study by scientists from the **Indian Institute of Tropical Meteorology (IITM), Pune**, and collaborating institutions has provided a **global, long-term classification of atmospheric aerosols**, improving understanding of their diversity and helping refine **climate models** and weather predictions. The findings enhance knowledge of aerosol–climate interactions across different regions of the world.

About Aerosols

- **Aerosols** are **tiny solid or liquid particles suspended in the atmosphere**.
- **Size:** Ranges from a few **nanometres** to several **micrometres**.
- **Sources:**
  - **Natural:** Desert dust, sea salt, volcanic ash, pollen, forest fires.
  - **Anthropogenic:** Vehicle emissions, industrial pollution, biomass burning, fossil-fuel combustion.
- **Types:**
  - **Primary Aerosols:** Emitted directly into the atmosphere (e.g., dust, sea spray, volcanic ash).
  - **Secondary Aerosols:** Formed through chemical reactions of gases such as **SO_2, NOx, and VOCs** in the atmosphere.

Climate Significance

- Aerosols influence Earth's **radiation balance** by:
  - **Scattering sunlight** (cooling effect).
  - **Absorbing sunlight** (warming effect, e.g., black carbon).
- They act as **Cloud Condensation Nuclei (CCN)**, influencing cloud formation, rainfall patterns, and monsoon dynamics.
- Unlike greenhouse gases, aerosols generally have a **short atmospheric lifetime** (days to weeks), but exert strong regional climatic effects.

Picrorhiza kurroa (Kutki)

Why in News?

Farmers in **Mandi district, Himachal Pradesh**, have pioneered a **sustainable stolon-based cultivation model** for **Picrorhiza kurroa (Kutki)**. Instead of uprooting the entire plant, only the **stolons** are harvested, allowing the parent plant to regenerate naturally and reducing pressure on wild populations.

About Picrorhiza kurroa (Kutki)

- A **high-value perennial medicinal herb** with creeping rhizomes.
- **Family:** Plantaginaceae.
- The name is derived from the Greek words **'Picros' (bitter)** and **'Rhiza' (root)**, meaning **"bitter root."**
- **Habitat:** Alpine and sub-alpine Himalayas at **2,700–4,500 m** altitude.
- **Distribution:** Jammu & Kashmir, Himachal Pradesh, Uttarakhand, Sikkim, Nepal, Bhutan, Pakistan, Tibet, western China, and Myanmar.
- Prefers **moist, north-west-facing rocky slopes** with **well-drained sandy-clay soil**.

Medicinal Importance & Conservation

- Widely used in **Ayurveda** for liver disorders, digestive ailments, fever, asthma, and cough.
- Rich in bioactive compounds such as **Picroside I** and **Picroside II**.
- **Propagation:** Through **rhizomes, stolons, and seedlings**.
- **Conservation Status:**
  - **IUCN Red List: Endangered**
  - **CITES: Appendix II** (international trade regulated through permits).

Allographa: Five New Lichen Species from the Western Ghats

Why in News?

Researchers from **MACS Agharkar Research Institute, Pune**, under the Department of Science & Technology, discovered **five new species of *Allographa***, a genus of lichen-forming fungi, from the Western Ghats.

Key Facts

- **Five new species:** *A. keralensis, A. nayakae, A. paraconsanguinea, A. persistinspersa* and *A. semicarbonisata*.
- **Family: Graphidaceae**.
- *Allographa* is a genus of **script lichens**, characterised by elongated fruiting structures.
- Lichens represent a **symbiotic association between fungi and algae/cyanobacteria**.
- Researchers combined **morphological, chemical and molecular** approaches.
- DNA analysis used three genetic markers: **mtSSU, nrLSU and RPB2**.
- The study is the **first comprehensive molecular phylogenetic investigation of *Allographa* in the Western Ghats**.

Ecological Significance

Lichens are highly sensitive to **air pollution and habitat changes**, making them useful **bioindicators of forest health and environmental quality**. Their diversity can therefore help identify ecologically sensitive areas and strengthen biodiversity monitoring.

Pachycheles ravichandrani: New Porcelain Crab from Lakshadweep

Why in News?

Scientists discovered a new porcelain crab, ***Pachycheles ravichandrani***, from the **shallow coral reefs of Agatti Island, Lakshadweep**. The species was discovered during a 2024 survey and identified using **integrative taxonomy**.

Key Facts

- **Location:** Agatti Island, **Lakshadweep**; found at depths of **less than 1 metre** among coral-covered rocks.
- **Size:** Tiny crustacean, about **3–4 mm**.
- **Appearance:** Deep **carmine-red shell**, white dorsal blotch and spotted claws.
- **Taxonomy:** Genus **Pachycheles**; Family **Porcellanidae**; Order **Decapoda**.
- Porcelain crabs **resemble true crabs but are more closely related to squat lobsters**.
- Distinguished through **morphological examination + mitochondrial DNA sequencing**, demonstrating **integrative taxonomy**.
- Genetic analysis showed significant divergence from related species.
- Named after **M. Ravichandran**, former Secretary, Ministry of Earth Sciences, recognising his contribution to the **Deep Ocean Mission**.

Ecological Significance

Porcelain crabs inhabit **coral reef ecosystems** and contribute to **nutrient recycling and ecosystem health**. Their discovery highlights the rich but understudied biodiversity of Lakshadweep's shallow reefs.

Coal Gasification: Converting Coal into Clean Fuel and Chemicals

Why in News?

The Government has reiterated its target of achieving **100 million tonnes (MT) of coal gasification capacity by 2030** as part of its strategy to enhance **energy security**, reduce dependence on imported fuels, and promote value addition to domestic coal. The Ministry of Coal is also implementing incentive schemes to accelerate commercial coal gasification projects.

Key Facts

- **Coal Gasification** is the process of converting **coal into synthesis gas (syngas)** by reacting it with **oxygen, steam, and a controlled amount of air** at high temperatures.
- **Syngas** mainly consists of:
  - **Carbon Monoxide (CO)**
  - **Hydrogen (H_2)**
  - Small quantities of **Carbon Dioxide (CO_2)** and **Methane (CH_4)**.
- **Uses of Syngas:**
  - Electricity generation through Integrated Gasification Combined Cycle (IGCC).
  - Production of **methanol**, **ammonia**, **urea**, and other petrochemicals.
  - Manufacture of **Synthetic Natural Gas (SNG)**.
  - Hydrogen production for industrial and clean energy applications.
- **National Target:**
  - **100 MT coal gasification capacity by 2030.**
  - Supported through the **National Coal Gasification Mission** and a **₹37,500 crore incentive scheme** for commercial-scale coal and lignite gasification projects.
- **Implementing Ministry: Ministry of Coal**.
- **Major Benefits:**
  - Reduces dependence on imported crude oil, natural gas, methanol, and fertilizers.
  - Promotes value addition to India's abundant domestic coal reserves.
  - Produces cleaner-burning gaseous fuels compared to direct coal combustion.
  - Supports the development of a domestic chemicals and hydrogen industry.
- **Challenges:**
  - High capital and operational costs.
  - Significant water requirement.
  - Carbon dioxide emissions unless integrated with **Carbon Capture, Utilisation and Storage (CCUS)** technologies.
  - Technological complexity and long gestation periods.

Legionnaires' Disease: Water-System Linked Pneumonia

Why in News?

A **Legionnaires' disease outbreak in New York City's Upper East Side** resulted in multiple deaths and dozens of cases in July 2026. Health authorities detected *Legionella* bacteria in several **cooling towers**, highlighting the importance of water-system maintenance.

What is Legionnaires' Disease?

- A severe form of **pneumonia** caused mainly by ***Legionella pneumophila***, a Gram-negative bacterium.

- Bacteria thrive in **warm, stagnant or poorly maintained water systems**.
- Transmission generally occurs by **inhaling contaminated water droplets/aerosols**, not by drinking contaminated water.
- Common sources: **cooling towers, hot tubs, showers and complex building water systems**.
- **Person-to-person transmission is extremely rare**.
- Symptoms include **high fever, cough, shortness of breath, muscle aches and headache**.
- Higher-risk groups include **older adults, smokers and people with chronic lung disease or weakened immunity**.

Lestes paloti: Newly Discovered Damselfly from the Western Ghats

Why in News?

A team of researchers discovered a **new species of damselfly, *Lestes paloti***, from the **Western Ghats of Kerala**. The species was identified from high-altitude wetlands and has been named in honour of renowned odonatologist **K.A. Subramanian Palot** for his contributions to the study of dragonflies and damselflies. The discovery underscores the rich but still underexplored biodiversity of the **Western Ghats**, a global biodiversity hotspot.

Key Facts

- **Scientific Name:** *Lestes paloti*.
- **Group: Damselfly** (Order **Odonata**, Suborder **Zygoptera**).
- **Family: Lestidae** (Spreadwing damselflies).
- **Discovery Location:** High-altitude wetlands and marshy habitats in the **southern Western Ghats of Kerala**.
- **Distinctive Features:**
  - Metallic green slender body.
  - Blue-green eyes.
  - Characteristic wing venation and male anal appendages distinguishing it from related *Lestes* species.
- **Habitat:** Temporary freshwater pools, marshes, and montane wetlands.
- **Ecological Importance:**
  - Acts as a **bioindicator** of freshwater ecosystem health.
  - Helps regulate mosquito populations by preying on small insects.
  - Indicates the ecological significance of Western Ghats wetlands.

Pygoluciola mawsynram: New Firefly Species Discovered from the World's Wettest Region

Why in News?

A team of researchers discovered a **new species of firefly**, ***Pygoluciola mawsynram***, from **Mawsynram in Meghalaya**, one of the world's wettest places. The discovery highlights the rich but underexplored insect biodiversity of the **Eastern Himalaya Biodiversity Hotspot** and underscores the need for habitat conservation.

Key Facts

- **Scientific Name:** *Pygoluciola mawsynram*.
- **Family: Lampyridae** (Fireflies/Lightning bugs).
- **Genus:** *Pygoluciola*, a group of **small bioluminescent fireflies** distributed mainly across South and Southeast Asia.
- **Discovery Site: Mawsynram**, **East Khasi Hills**, **Meghalaya**—recognized as one of the **wettest places on Earth**.

- Fireflies are **beetles (Order: Coleoptera)** and **not flies**.
- They produce light through **bioluminescence**, a chemical reaction involving **luciferin**, **luciferase**, oxygen, and ATP, primarily for **mate attraction and communication**.
- Fireflies are considered **bioindicators**, as they thrive in **dark, humid, and minimally disturbed habitats**.
- Major threats include:
  - Light pollution
  - Habitat loss and fragmentation
  - Pesticide use
  - Climate change.

SCIENCE & TECHNOLOGY

GAGAN (GPS Aided GEO Augmented Navigation): India's Indigenous Satellite-Based Aviation Navigation System

Why in News?

India achieved a major milestone in civil aviation when an **IndiGo Airbus A320** became the **first commercial jet in the country to perform a satellite-based landing** using the indigenous **GAGAN (GPS Aided GEO Augmented Navigation)** system at **Udaipur Airport**, under the supervision of the **Directorate General of Civil Aviation (DGCA)**. This marks the first use of GAGAN's **Satellite-Based Landing System (SLS)** approach for a jet aircraft in India.

About GAGAN

- **Full Form:** GPS Aided GEO Augmented Navigation.
- India's **Satellite-Based Augmentation System (SBAS)** jointly developed by **ISRO** and the **Airports Authority of India (AAI)**.
- It **augments GPS signals** by providing correction and integrity information, enabling highly accurate aircraft navigation.

- Became operational in **2013–14** and complies with **International Civil Aviation Organization (ICAO)** standards.

Key Features

- Uses **geostationary satellites** (including **GSAT-8** and **GSAT-10**) along with a network of **ground reference stations**.
- Improves navigation accuracy to **about 1–3 metres**.
- Enables **precision approach and landing** even at airports lacking an **Instrument Landing System (ILS)**.
- Compatible with global SBAS systems such as **WAAS (USA)**, **EGNOS (Europe)** and **MSAS (Japan)**.

Alanine Aminotransferase (ALT/SGPT): A Key Biomarker for Early Detection of Liver Injury

Why in News?

The **Union Ministry of Health and Family Welfare** has advised people to **monitor Alanine Aminotransferase (ALT) levels** as an early indicator of liver injury, highlighting the rising burden of liver diseases such as **Metabolic Dysfunction-Associated Steatotic Liver Disease (MASLD)** and viral hepatitis.

What is Alanine Aminotransferase (ALT)?

- **ALT**, also known as **Serum Glutamic-Pyruvic Transaminase (SGPT)**, is an enzyme found predominantly in **liver cells (hepatocytes)**.
- It plays a crucial role in **amino acid metabolism** by catalysing the conversion of **alanine to pyruvate**.
- Normally, only small amounts of ALT are present in the bloodstream. Damage to liver cells causes ALT to leak into the blood, making it an important **biomarker of liver injury**.

Clinical Significance

- ALT is a key component of the **Liver Function Test (LFT)**.
- Elevated ALT levels may indicate:
  - **Fatty Liver Disease (MASLD)**
  - **Viral Hepatitis (A, B, C, etc.)**
  - Alcohol-related liver disease
  - Drug-induced liver injury
  - Autoimmune liver disorders
- **Raised ALT alone does not confirm liver disease**; further clinical evaluation and additional tests (e.g., AST, bilirubin, imaging) are necessary.

SHetA2 Therapy: Indigenous Anti-HPV Candidate for Cervical Precancer

Why in News?

The **Indian Council of Medical Research (ICMR)** has licensed **SHetA2**, a novel anti-HPV therapeutic candidate, to **Emcure Pharmaceuticals** for further development and commercialisation. It is being developed as a potential treatment for **Cervical Intraepithelial Neoplasia (CIN)**, a precancerous condition of the cervix.

What is SHetA2?

- **Type:** Small-molecule, oral therapeutic candidate.
- **Target:** HPV-driven precancerous/cancerous changes.
- Developed through collaboration between **ICMR-National Institute of Cancer Prevention and Research (NICPR)** and the **University of Oklahoma's Stephenson Cancer Center**.
- It targets host proteins such as **mortalin, Hsc70 and Grp78**, disrupting the interaction between HPV's **E7 oncoprotein** and host proteins, thereby promoting destruction of abnormal cells.

- It is intended to selectively affect HPV-driven abnormal cells while sparing healthy tissue.

Key Concept: HPV & Cervical Cancer

Human Papillomavirus (HPV) is a major cause of cervical cancer. **HPV vaccination prevents infection**, whereas SHetA2 is a **therapeutic candidate** aimed at treating HPV-associated precancerous lesions. Thus, it **does not replace HPV vaccination or screening**.

Andromeda Galaxy: M31 and Its Transition into a Mature Galactic Phase

Why in News?

Recent astronomical studies suggest that the **Andromeda Galaxy (M31)** is entering a more mature or **"middle-age" phase**, marked by declining star formation and increasing stellar maturity. Andromeda is particularly important because it is the **nearest major galaxy to the Milky Way** and a key member of the **Local Group**.

About Andromeda Galaxy

- **Designation: M31**; also known as **Andromeda Galaxy**.
- **Type: Barred spiral galaxy**.
- **Location:** Approximately **2.5 million light-years** from Earth.
- **Constellation: Andromeda**.
- It is the **largest galaxy in the Local Group**, which contains the Milky Way, Andromeda, Triangulum Galaxy (M33) and numerous dwarf galaxies.
- Andromeda contains **hundreds of billions of stars** and has a prominent central bulge.

Galactic Evolution

Galaxies evolve through processes including **star formation, gas accretion, stellar ageing and mergers**. Andromeda's declining star-formation activity indicates a transition from a relatively active phase toward a more mature stellar population.

Milky Way–Andromeda Interaction

- Both are among the **most massive galaxies of the Local Group**.
- Their gravitational interaction is expected to produce a **future close encounter/merger**, although the precise timing and outcome remain uncertain.

Blue Straggler Stars

Why in News?

Indian astronomers have made the **world's first confirmed discovery of a Blue Straggler Star hosting a brown dwarf companion** in an exceptionally compact binary system. The finding provides new insights into the formation and evolution of blue straggler stars and challenges conventional theories of stellar ageing.

About Blue Straggler Stars (BSS)

- **Blue Straggler Stars (BSS)** are stars that appear **hotter, brighter, bluer, and younger** than other stars in the same star cluster, despite having formed at nearly the same time.
- They are commonly found in **globular clusters** and **open clusters**, where stars are expected to have similar ages.
- Their position on the **Hertzsprung–Russell (H-R) Diagram** lies **above the main-sequence turn-off point**, apparently defying normal stellar evolution.

Formation Mechanisms

- **Mass Transfer:** A star gains mass from a companion in a binary system, making it appear younger (**most widely accepted mechanism**).
- **Stellar Merger/Collision:** Two stars merge, producing a more massive and luminous star.

- The recent discovery supports the **mass-transfer hypothesis**, with the companion identified as a **brown dwarf**.

PRAXIS Mission: NASA's AI-Powered Concept to Explore Saturn's Rings

Why in News?

NASA has selected **PRAXIS (Planetary Rings Autonomous EXploration with In-situ Sampling)** as a **Phase-I concept** under the **NASA Innovative Advanced Concepts (NIAC) 2026** programme. The mission proposes the **first-ever in-situ sampling of Saturn's rings**, using artificial intelligence to autonomously navigate the hazardous ring environment.

About PRAXIS Mission

- **Full Form: Planetary Rings Autonomous EXploration with In-situ Sampling (PRAXIS)**.
- **Agency: NASA**.
- **Programme: NASA Innovative Advanced Concepts (NIAC) – Phase I (2026)**.
- **Mission Lead: Dr. Marco Quadrelli**, **NASA Jet Propulsion Laboratory (JPL)**.
- **Target: Saturn's ring system**.
- **Status: Concept mission** (not yet approved for launch).

Key Features

- Designed to become the **first mission to directly collect and analyse particles from Saturn's rings**.
- Employs **Artificial Intelligence (AI)** for:
  - Autonomous navigation through dense ring particles.
  - Collision avoidance.
  - Precision sampling in a dynamic environment.
- Will use advanced robotic sampling technology and **miniaturised in-situ analytical instruments** to study ring particles.
- Aims to determine the **composition, age, origin, and evolution** of Saturn's rings—questions that the **Cassini mission** could not fully answer.

INSAT-3DR

Why in News?

Recently, **INSAT-3DR** satellite images released by the **India Meteorological Department (IMD)** showed **cloud cover over nearly two-thirds of India** as the southwest monsoon became highly active. The satellite data enabled real-time monitoring of cloud systems, rainfall intensity, and storm development, improving weather forecasting and disaster preparedness.

About INSAT-3DR

- **INSAT-3DR (Indian National Satellite-3D Repeat)** is an advanced **geostationary meteorological satellite**.
- **Developed by:** Indian Space Research Organisation (**ISRO**).
- **Operated by:** India Meteorological Department (**IMD**).
- **Launched: 8 September 2016** aboard **GSLV-F05** from **Satish Dhawan Space Centre, Sriharikota**.
- It is the **follow-on mission to INSAT-3D**, strengthening India's operational weather observation capabilities.

Key Features

- **Orbit:** Geostationary orbit at **74° East**.
- **Major Payloads:**
  - **6-channel Multispectral Imager** – monitors clouds, cyclones, land and ocean surfaces.

- **19-channel Atmospheric Sounder** – measures vertical profiles of temperature and humidity.
- **Data Relay Transponder (DRT)** – collects meteorological and hydrological data from remote stations.
- **Satellite-Aided Search and Rescue (SAS&R)** – supports distress alert detection under the **COSPAS-SARSAT** programme.

- Provides **weather updates every 15 minutes** for forecasting and nowcasting.

Borophene: India's Breakthrough in 2D Nanomaterials for Green Lubrication

Why in News?

Scientists at the **Institute of Advanced Study in Science and Technology (IASST), Guwahati**, an autonomous institute under the **Department of Science and Technology (DST)**, have demonstrated for the first time that **borophene** can serve as a high-performance additive in **castor oil**, creating an eco-friendly lubricant that significantly reduces friction and energy loss. The findings were published in **ACS Applied Engineering Materials**.

About Borophene

- **Borophene** is a **two-dimensional (2D) allotrope of boron**, consisting of a **single-atom-thick sheet** of boron atoms.
- Unlike **graphene**, borophene is **highly polymorphic**, meaning its atomic arrangement varies with synthesis conditions.
- It exhibits:
  - High electrical conductivity
  - Exceptional mechanical strength
  - Lightweight and flexibility
  - High surface area and chemical reactivity.

Key Findings

- Addition of only **0.1 wt.% borophene** to **castor oil** reduced friction by nearly **42%**.
- It forms a protective **tribofilm** (low-friction surface layer) comprising iron oxides, carbonaceous compounds, and boron-based compounds.
- Applications include:
  - Green lubrication technologies
  - Renewable energy systems
  - Marine equipment
  - Sustainable manufacturing
  - Industrial machinery.

Electric Vertical Take-off and Landing Aircraft (eVTOL)

Why in News?

The ePlane Company, an **IIT Madras-incubated startup**, has unveiled India's first **full-scale electric air taxi prototype**, the **e200X (PT-01)**. The company is targeting **flight testing in 2027**, marking a significant development in India's emerging **electric aviation and urban air mobility** sector.

What are eVTOL Aircraft?

eVTOL stands for **Electric Vertical Take-off and Landing** aircraft.

These are aircraft that use **electric propulsion** and are designed to **take off and land vertically**, eliminating the need for conventional runways.

They combine characteristics of:

- **Helicopters** → Vertical take-off and landing.
- **Fixed-wing aircraft** → Efficient forward flight and longer-range travel.
- **Electric vehicles** → Battery-powered propulsion and potentially lower operational emissions.

How Do They Work?

eVTOL aircraft generally use multiple **electric motors and rotors/propellers**.

The basic flight cycle involves:

Vertical take-off → Transition to forward flight → Cruise → Transition back → Vertical landing

Different designs use different configurations, including:

- **Multirotor:** Multiple rotors provide both lift and propulsion.
- **Lift-plus-cruise:** Separate systems for vertical lift and horizontal cruise.
- **Vectored thrust:** Rotors or propellers change orientation to transition between vertical and forward flight.

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

Why in News?

India has approved **QDENGA (TAK-003)**, developed by **Takeda**, as the **first dengue vaccine to receive regulatory approval in India**. The **Drug Controller General of India (DCGI)** has granted market authorisation for individuals aged **4 to 60 years**. The vaccine targets all four dengue virus serotypes and is administered as a **two-dose schedule, three months apart**.

Key Facts

- **Brand name:** QDENGA
- **Vaccine candidate:** TAK-003
- **Developer: Takeda Pharmaceutical Company**, Japan
- **Type: Live attenuated, tetravalent dengue vaccine**
- **Target:** All four dengue virus serotypes:
  - **DENV-1**
  - **DENV-2**
  - **DENV-3**
  - **DENV-4**
- **India's regulatory approval: DCGI**
- **Approved age group in India: 4–60 years**
- **Dosage: 2 doses**, administered **3 months apart**
- **Prior dengue infection:** Unlike **Dengvaxia**, QDENGA does **not require proof of previous dengue infection** before vaccination.

What is Dengue?

Dengue is a **viral disease transmitted primarily by the bite of infected *Aedes aegypti* mosquitoes**. It is caused by the **dengue virus (DENV)**, which has **four major serotypes—DENV-1 to DENV-4**.

A person can develop immunity to the infecting serotype after infection, but infection with a different serotype can occur later. This makes development of a vaccine providing broad protection against all four serotypes particularly challenging.

White Rabbit Technology: Securing India's Standard Time

Why in News?

India commissioned a **White Rabbit Technology-based Indian Standard Time (IST) Dissemination Demonstration Network** at the **Regional Reference Standard Laboratory (RRSL), Bengaluru**. It aims to provide secure, highly accurate and indigenous time synchronisation for critical infrastructure.

What is White Rabbit Technology?

- **White Rabbit (WR)** is a high-precision **time synchronisation technology** based on **Precision Time Protocol (PTP)**.
- It can distribute time with **sub-nanosecond-level accuracy** over fibre-optic networks.
- It improves **accuracy, reliability and resistance to tampering** compared with conventional network time synchronisation.
- It is particularly useful where precisely synchronised clocks are essential.

India's Network

- Developed jointly by **Department of Consumer Affairs, CSIR–National Physical Laboratory (CSIR-NPL) and ISRO**.
- Provides **UTC (NPLI)-traceable Indian Standard Time**.
- Secure IST dissemination has been verified between **RRSL Bengaluru and NSE Chennai**.
- Supports **banking, financial markets, telecom, power grids, transportation and digital governance**.
- Forms part of the **"One Nation, One Time"** initiative.

Vikram-I Rocket: India's First Privately Developed Orbital Launch Vehicle

Why in News?

Skyroot Aerospace is set to launch **Vikram-I**, **India's first privately developed orbital-class rocket**, under **Mission Aagaman**. The maiden launch is scheduled during the **12 July–4 August 2026** launch window from the **Satish Dhawan Space Centre (SDSC), Sriharikota**, marking a historic milestone for India's private space ecosystem.

About Vikram-I

- Developed by **Skyroot Aerospace**, a Hyderabad-based private space company.
- Named after **Dr. Vikram Sarabhai**, the father of the Indian space programme.
- It is **India's first privately developed orbital-class launch vehicle**.
- Built to cater to the rapidly growing **small satellite launch market**.

Key Features

- **Type:** Four-stage orbital launch vehicle.
- **Propulsion:**
  - **First three stages:** Solid-fuel propulsion.
  - **Fourth stage:** Hypergolic liquid stage powered by a cluster of **four Raman engines** using **MMH (Monomethylhydrazine)** and **NTO (Nitrogen Tetroxide)**.
- Constructed using an **all-carbon composite structure** for reduced weight.
- Incorporates **3D-printed engines**, advanced avionics, and **ultra-low-shock pneumatic stage separation**.
- **Payload Capacity:**
  - Up to **350kg**to**Low Earth Orbit (LEO)**.
  - Around **260kg**to **Sun-Synchronous Orbit (SSO)**.
- Designed for **rapidlaunch readiness** and deployment of **multiple satellites** in a single mission.

HISTORY AND ART & CULTURE

Soliga Tribe: Indigenous Knowledge and the Case against Fortress Conservation

Why in News?

A recent study highlighted the **Soligas of the Biligiri Rangaswamy Temple (BRT) landscape in Karnataka** as an example of how indigenous communities can coexist with wildlife, challenging the **"fortress conservation"** model that seeks to protect biodiversity by excluding local communities.

About the Soliga Tribe

- **Distribution:** Primarily **Karnataka and Tamil Nadu**, especially the **Biligiri Ranganatha Hills and Male Mahadeshwara Hills**.
- **Meaning:** *Soliga* broadly means **"children of bamboo"**, reflecting their close relationship with forests.
- **Language: Sholaga**, belonging to the **Dravidian** language family; Kannada and Tamil are also spoken.
- **Livelihood:** Traditionally dependent on **minor forest produce**, shifting cultivation and other forest-based activities.
- **Beliefs:** Elements of **animism/naturism** coexist with Hindu practices.

Conservation Significance

The Soligas have traditional ecological knowledge and practices that support biodiversity conservation. Their case illustrates the potential of **community-based conservation** and **co-management**, rather than treating local communities solely as threats to protected areas.

Pithora Painting: GI-Tagged Sacred Tribal Art of Gujarat

Why in News?

Pithora painting, a traditional ritualistic wall art of central Gujarat, has recently received renewed attention for its role in **tribal cultural preservation and artisan livelihoods**. The art received its **GI tag in 2021**, strengthening its recognition and market opportunities.

About Pithora Painting

- **Region:** Mainly **Chhota Udaipur, Panchmahal and Vadodara** areas of Gujarat; also practised in adjoining Madhya Pradesh.
- **Communities:** Primarily **Rathwa, Bhil and Bhilala** communities.
- **Nature:** A **sacred ritual wall painting**, rather than merely decorative art.
- Named after **Pithora/Pithora De**, a tribal deity associated with prosperity, protection and well-being.
- Traditionally painted on the **walls of tribal homes**, especially during important rituals or fulfilment of vows.
- **Motifs:** Horses, elephants, deities, animals, plants, celestial bodies and scenes representing tribal life and beliefs.

GI & Cultural Significance

- **GI status:** Granted in **2021**.
- Traditional colours are prepared largely from **natural materials**, including plant-based pigments and other locally available substances.
- The art preserves **tribal mythology, ecological knowledge, religious beliefs and community traditions**.

- Institutional promotion has helped shift the art from **ritual walls to contemporary canvases and wider markets**.

Museum Grant Scheme

Why in News?

The **Ministry of Culture** recently announced **financial assistance under the Museum Grant Scheme** for the establishment of new museums and the modernization of existing ones. The scheme aims to strengthen India's museum infrastructure, promote digitisation of collections, and preserve tangible cultural heritage.

About the Museum Grant Scheme

- **Launched: 2013** by the **Ministry of Culture**.
- **Objective:** To establish new museums and strengthen, modernize, and digitise existing museums at the **regional, state, and district levels**.
- **Eligible Institutions:**
  - Central & State Governments
  - Autonomous Bodies
  - Public Sector Undertakings (PSUs)
  - Local Bodies
  - Academic Institutions
  - Trusts and Societies registered under the Societies Registration Act.

Key Components

- Development and establishment of **new museums**.
- Modernisation and upgradation of **existing museums**.
- **Digitisation** of museum collections.
- Creation of **Virtual Experiential Museums (VEMs)**.
- **Capacity building and training** of museum professionals.
- Support for **Projects of National Importance** (added in the revised guidelines of 2021).

Undavalli Caves: A Masterpiece of Rock-Cut Architecture and Religious Syncretism in Andhra Pradesh

Why in News?

The **Undavalli Caves** in Andhra Pradesh recently hosted the **Telugu Mahotsavam**, a cultural festival celebrating Telugu language, literature, and heritage. The event renewed attention on one of South India's finest examples of **ancient rock-cut architecture** and its historical significance.

About Undavalli Caves

- **Location:** Undavalli village, **Guntur district**, Andhra Pradesh, on the banks of the **Krishna River**, near Vijayawada.
- **Period:** Built between the **4th and 5th centuries CE**.
- **Dynastic Association:** Primarily associated with the **Vishnukundina dynasty**, with architectural influences of the **Gupta period**.
- **Material:** Carved out of **solid sandstone** on a hillside.
- Protected as a **Monument of National Importance** by the **Archaeological Survey of India (ASI)**.

Architectural & Cultural Significance

- A **four-storeyed rock-cut cave complex** showcasing early **Gupta-style architecture**.
- Originally served as a **Buddhist-Jain monastic complex**, later transformed into a **Hindu temple**, reflecting religious continuity and syncretism.

- Houses a **5-metre-long monolithic reclining image of Lord Vishnu (Anantasayana)**, one of its most distinctive features.
- The caves also contain sculptures of **Brahma, Shiva, Vishnu, lions, elephants**, and ornate pillars, demonstrating advanced rock-cut craftsmanship.

Tripura Sarinda: GI-Tagged Indigenous Bowed String Instrument of Northeast India

Why in News?

The **Tripura Sarinda**, a traditional bowed string musical instrument of Tripura's indigenous communities, was showcased at the **National Handicrafts Exhibition** after recently receiving the **Geographical Indication (GI) tag**. The recognition aims to preserve the state's rich tribal musical heritage while enhancing livelihood opportunities for traditional artisans.

About Tripura Sarinda

- **Sarinda** is a **traditional bowed string instrument** deeply associated with the **tribal communities of Tripura**.
- It is locally known as **Sarinda Uakhrap**.
- The instrument is **hand-carved from a single block of wood** with a hollow resonating chamber.
- The resonator is covered with **animal skin**, while the strings are traditionally made of **animal gut, Muga silk thread, or metal**.
- It is played using a **horsehair bow** and produces a deep, resonant sound.
- The instrument is widely used during **folk songs, dances, religious rituals, and cultural ceremonies**.

Sarnath: Cradle of the Buddha's First Sermon and India's 45th UNESCO World Heritage Site

Why in News?

Sarnath, one of Buddhism's holiest pilgrimage centres, was **inscribed on the UNESCO World Heritage List**, becoming **India's 45th UNESCO World Heritage Site**. The inscription was approved during the **48th Session of the UNESCO World Heritage Committee** held in **Busan, South Korea**, recognizing its outstanding universal value as the site of Buddha's first sermon.

About Sarnath

Location: Near **Varanasi**, Uttar Pradesh, at the confluence region of the **Ganga** and **Varuna** rivers.

Ancient name: **Isipatana (Rishipattana)** or **Mrigadava (Deer Park)**.

It is the place where **Gautama Buddha delivered his first sermon** (*Dhammacakkappavattana Sutta*) after attaining enlightenment at Bodh Gaya, thereby setting in motion the **Dharmachakra (Wheel of Dharma)**.

It is one of the **four principal Buddhist pilgrimage sites**, along with **Lumbini, Bodh Gaya, and Kushinagar**.

Major Monuments

- **Dhamek Stupa** – Marks the site of the First Sermon.
- **Dharmarajika Stupa** – Built by **Emperor Ashoka** (later damaged).
- **Ashokan Pillar** – The **Lion Capital** serves as the **National Emblem of India**.
- **Mulagandha Kuti Vihara** – Modern Buddhist temple.
- **Sarnath Archaeological Museum** – Houses the original Lion Capital and important Buddhist sculptures.

Pandya Dynasty: Ancient Tamil Powerhouse of Trade, Culture and Temple Architecture

Why in News?

An **800-year-old Shiva temple** belonging to the **Later Pandya period** was recently unearthed at **Udampatti village, Melur Taluk, Madurai district, Tamil Nadu**. The discovery provides fresh evidence of the architectural and cultural legacy of the Pandya rulers.

About the Pandya Dynasty

- One of the **three crowned Tamil dynasties (Muvendar)**, along with the **Cholas** and **Cheras**.
- Flourished from at least the **4th century BCE** until the **16th century CE**.
- **Early Capital: Korkai** (major pearl-fishing port); later shifted to **Madurai**.
- Revived by **Kadungon** in the **6th century CE** after overthrowing the **Kalabhras**.
- Reached its zenith under **Jatavarman Sundara Pandyan I** and **Maravarman Sundara Pandyan** during the **13th century**.

Major Contributions

- Patronised **Sangam literature**, Tamil language, and temple architecture.
- Maintained flourishing **maritime trade** with **Rome**, **Southeast Asia**, and **Sri Lanka**.
- Controlled the famous **pearl fisheries** along the Gulf of Mannar.
- **Dynastic symbol: Twin Fish**.
- Important literary and foreign sources:
  - **Sangam texts** (*Maduraikkanchi*, *Purananuru*)
  - Ashokan Edicts
  - Megasthenes
  - Periplus of the Erythraean Sea
  - Ptolemy
  - Marco Polo.

Guru Ravidas: Bhakti Saint, Social Reformer and Champion of Equality

Why in News?

The **Punjab Government** launched a **statewide documentary campaign** to commemorate the **650th Parkash Purab (birth anniversary)** of **Guru Ravidas**. As part of the initiative, **50 LED-equipped mobile documentary vans** will travel across nearly **13,000 villages** in Punjab to spread his message of **equality, social justice, devotion, and universal brotherhood**.

About Guru Ravidas

- Lived during the **15th–16th century CE** and was one of the foremost saints of the **Nirguna Bhakti tradition**.
- Born at **Seer Govardhanpur (Varanasi), Uttar Pradesh**.
- Contemporary of **Kabir** and regarded as the **guru of Mirabai** according to popular tradition.
- Preached **devotion (Bhakti)**, equality, dignity of labour, and rejection of **caste discrimination** and ritualism.
- Envisioned **"Begumpura"**—an ideal society free from inequality, oppression, and suffering.

Literary & Religious Significance

- **Forty-one hymns** attributed to Guru Ravidas are included in the **Guru Granth Sahib**.
- His teachings emphasise:
  - Oneness of God
  - Social equality
  - Compassion and humility
  - Spiritual liberation through devotion rather than rituals.

- Revered by followers across **Sikhism**, the **Ravidassia community**, and the broader **Bhakti tradition**.

Arul Mihu Navasakthi Vinayagar Temple: A Symbol of Indian Heritage in Seychelles

Why in News?

During his **State Visit to Seychelles**, the **Prime Minister of India** offered prayers at the **Arul Mihu Navasakthi Vinayagar Temple** in **Victoria**, underscoring the enduring cultural ties between India and Seychelles and the contribution of the Indian diaspora to the island nation.

About the Temple

- Located in **Victoria**, the capital city of **Seychelles**, on **Mahé Island**.
- It is the **only Hindu temple in Seychelles**.
- Constructed in **1992** by the Hindu community, which constitutes around **2% of Seychelles' population**.
- Dedicated to **Lord Vinayagar (Lord Ganesha)**, revered as the remover of obstacles and the deity of wisdom and auspicious beginnings.

Architectural Features

- Built in the **Dravidian style of temple architecture**, similar to prominent temples of **Tamil Nadu**.
- Distinguished by its:
  - o Colourful **Gopuram (gateway tower)** rising nearly **100 feet**.
  - o Intricately carved sculptures of Hindu deities and mythological figures.
  - o **Garbha Griha (sanctum sanctorum)** housing the idol of Lord Vinayagar.
  - o **Mandapam**, used for prayers, rituals, and religious ceremonies.

Arunachaleswarar Temple: The Agni Sthalam of the Pancha Bhuta Temples

Why in News?

The **Arunachaleswarar Temple** in **Tiruvannamalai, Tamil Nadu**, was in the news after police arrested a person for allegedly using duplicate keys to facilitate unauthorized entry for devotees into the temple. The incident highlighted concerns regarding the management and security of one of India's most revered Shaivite temples.

About Arunachaleswarar Temple

- **Location:** Tiruvannamalai, Tamil Nadu, at the foothills of **Arunachala Hill**.
- **Presiding Deities: Lord Arunachaleswarar (Shiva)** and **Goddess Unnamulai Amman (Parvati)**.
- One of the **Pancha Bhuta Sthalams**, representing the element of **Fire (Agni)**.
- Also one of the **275/276 Paadal Petra Sthalams**, glorified in the **Tevaram** hymns of the Tamil Shaivite Nayanmars.
- The present temple complex was largely built by the **Cholas (9th century CE)**, with major additions by the **Vijayanagara rulers** and later the **Nayaks**.
- Spread over nearly **10 hectares**, it is among the **largest functioning Hindu temple complexes** in India and features four monumental **Rajagopurams**, with the eastern gopuram being one of the tallest in India.

Religious & Cultural Significance

- Associated with the **Lingodbhava** legend, where Lord Shiva manifested as an **infinite pillar of fire**, symbolizing his eternal nature.
- The world-famous **Karthigai Deepam** festival is celebrated by lighting a massive beacon atop **Arunachala Hill**, symbolizing the **Agni (Fire) Lingam**.

- Devotees undertake the **Girivalam (Giri Pradakshina)**—a **14-km circumambulation** around Arunachala Hill, especially on full moon days.

Batukeshwar Dutt: Revolutionary of the Hindustan Socialist Republican Association

Why in News?

On his death anniversary, Union Ministers paid tribute to **Batukeshwar Dutt**, remembered for his role in the **Central Legislative Assembly bombing of 1929** and his resistance to colonial rule.

Key Facts

- **Born:** 18 November 1910, Kanpur.
- Associated with the **Hindustan Socialist Republican Association (HSRA)**.
- Worked closely with **Bhagat Singh** and other revolutionary nationalists.
- On **8 April 1929**, Dutt and Bhagat Singh threw **non-lethal bombs** in the Central Legislative Assembly in Delhi.
- The objective was to **protest colonial repression and make the revolutionary message heard**, rather than cause fatalities.
- They deliberately **surrendered and used the subsequent trial as a platform for political propaganda**.
- Dutt was sentenced to **life imprisonment** and was subsequently incarcerated in **Cellular Jail, Andaman & Nicobar Islands**.
- He participated in the **hunger strike by political prisoners** demanding better treatment and recognition of their political status.

DEFENCE & SECURITY

K9 Vajra-T: India's Indigenous Self-Propelled Artillery for Modern Battlefield Operations

Why in News?

The **K9 Vajra-T self-propelled howitzer** was in the news following reports that its successful deployment in diverse terrains, including **high-altitude regions during Operation Sindoor**, has strengthened **India–South Korea defence cooperation** and opened discussions on the joint development of next-generation missile and artillery systems. The platform has emerged as a key example of India's growing indigenous defence manufacturing capability.

About K9 Vajra-T

- An **indigenously manufactured 155 mm/52 calibre tracked self-propelled howitzer**.
- Manufactured by **Larsen & Toubro (L&T)** in collaboration with **Hanwha Aerospace (South Korea)**.
- Based on the **South Korean K9 Thunder** artillery platform.
- Developed under the **'Buy Global' category with Transfer of Technology (ToT)** under the **Make in India** initiative.
- Over **60% indigenous content**, with production at **L&T's Armoured Systems Complex, Hazira (Gujarat)**.

Key Features

- **Calibre:** 155 mm/52 calibre.
- **Maximum Range:**
  - About **38 km** with standard ammunition.
  - Up to **50 km** with extended-range ammunition.
- **Maximum Speed:** Around **67 km/h** on roads.

- **Crew:** Five personnel.
- Equipped with:
  - Automatic fire control system.
  - High mobility on tracked chassis.
  - "Shoot-and-scoot" capability for rapid relocation after firing.
- Suitable for operations in **deserts, plains, and high-altitude terrain**, including **Ladakh**.

INS NIPUN: India's Second Indigenous Diving Support Vessel (DSV)

Why in News?

The **Indian Navy** received **INS NIPUN**, the country's **second indigenously built Diving Support Vessel (DSV)**, on **30 July 2026** at **Visakhapatnam**. Built by **Hindustan Shipyard Limited (HSL)**, the vessel significantly enhances India's underwater rescue and deep-sea operational capabilities under the **Aatmanirbhar Bharat** initiative.

Key Features of INS NIPUN

- **Type:** Diving Support Vessel (DSV).
- **Builder: Hindustan Shipyard Limited (HSL), Visakhapatnam**.
- Designed in accordance with the **Indian Register of Shipping (IRS)** classification rules.
- The Sanskrit word **"Nipun"** means **skilled, proficient, or adept**.
- Equipped with:
  - **Deep Sea Saturation Diving System**.
  - **State-of-the-art diving equipment**.
  - **Side Diving Stage** for underwater operations.
  - Capability for **deep-sea diving, underwater salvage, submarine rescue, and search-and-recovery missions**.
- Serves as a **mother ship** for the **Deep Submergence Rescue Vehicle (DSRV)**, strengthening submarine rescue capability.
- Follows **INS Nistar**, the first indigenous DSV delivered to the Navy.

Bhargavastra: Indigenous Counter-Drone System for Neutralising Swarm Drone Threats

Why in News?

The **Indian Army** recently witnessed the successful demonstration of **Bhargavastra**, an **indigenously developed counter-drone system** designed to detect and neutralise **swarm drone attacks**. The system strengthens India's air defence capabilities against the growing threat posed by low-cost unmanned aerial systems (UAS).

About Bhargavastra

- **Developer: Solar Defence and Aerospace Limited (SDAL)**, an Indian defence technology company.
- **Type: Counter-Unmanned Aerial System (C-UAS)**.
- **Purpose:** Detect, track, and destroy **single as well as swarm drones** threatening military installations and critical infrastructure.
- Developed under the **'Make in India'** and **Aatmanirbhar Bharat** initiatives to reduce dependence on imported defence technologies.

Key Features

- **Multi-layered defence architecture** for tackling drone swarms.
- Uses **micro-rockets** to intercept and destroy multiple drones simultaneously.
- Equipped with **advanced radar**, **Electro-Optical/Infrared (EO/IR) sensors**, and **Command-and-Control (C2) systems** for target detection and tracking.

- Capable of operating in **diverse terrains and weather conditions**.
- Provides a **cost-effective** solution against low-cost drone threats compared to conventional air defence missiles.
- Can protect **military bases, border areas, strategic installations, and critical infrastructure**.

Kheybar Shekan Missile: Iran's Indigenous Medium-Range Ballistic Missile

Why in News?

The **Kheybar Shekan missile** was widely discussed following its reported deployment by **Iran** during recent regional tensions in West Asia. The missile has drawn global attention due to its **high precision, solid-fuel propulsion**, and its role in strengthening Iran's indigenous missile capabilities.

About Kheybar Shekan Missile

- **Country:** Iran.
- **Developed by: Islamic Revolutionary Guard Corps (IRGC) Aerospace Force**.
- **Type: Medium-Range Ballistic Missile (MRBM)**.
- **Unveiled: 2022**.
- **Range:** Approximately **1,450 km**.
- **Propulsion: Solid-fuel**, enabling quicker launch and easier storage than liquid-fuel missiles.
- **Warhead:** Equipped with a **maneuverable re-entry vehicle (MaRV)** designed to enhance precision and improve penetration against missile defence systems.

Key Features

- High-precision guidance system with improved terminal accuracy.
- Road-mobile launcher enhances survivability and operational flexibility.
- Reduced launch preparation time due to solid-fuel technology.
- Designed to strike strategic military targets across West Asia.
- Represents an important component of Iran's indigenous missile programme.

Project BRAHMANK

Why in News?

Project BRAHMANK of the **Border Roads Organisation (BRO)** celebrated its **16th Raising Day** on **29 June 2026** at **Ranaghat, Arunachal Pradesh**. The occasion highlighted the project's significant contribution to strengthening strategic road connectivity and infrastructure in India's northeastern border region.

About Project BRAHMANK

- A flagship project of the **Border Roads Organisation (BRO)** under the **Ministry of Defence**.
- **Raised: 29 June 2011** at **Ranaghat, East Siang District, Arunachal Pradesh**.
- Became fully operational on **3 December 2011**.
- Responsible for developing and maintaining strategic infrastructure across:
  - Siang
  - East Siang
  - West Siang
  - Upper Siang
  - **Shi-Yomi** districts of Arunachal Pradesh
  - Parts of **Dhemaji district** in Assam.

Major Achievements

- Maintains **811 km of strategic roads** and around **86 bridges**.
- Notable engineering works include:
  - **100-metre steel arch bridge** over **Siyom Nallah**.

- o **165-metre PSC bridge** over **Simang Nallah** on the **Along–Yingkiong Road**.
- During **FY 2025–26**:
  - o Inaugurated **13 bridges** with a cumulative span of **390 metres**.
  - o Blacktopped **61 km of roads** to **National Highway Double Lane (NHDL)** standards.
  - o Developed **helipads** to improve connectivity in remote border areas.

Samudra Pradakshina

Why in News?

The **Raksha Mantri** flagged in the **Samudra Pradakshina** expedition after its successful completion, marking the culmination of the **world's first Tri-Service all-women circumnavigation sailing expedition**. The mission showcased India's maritime capabilities, women's empowerment, and indigenous defence manufacturing.

Key Features

- **Samudra Pradakshina** is the **first-ever Tri-Service all-women global circumnavigation sailing expedition**.
- **Organised by:** Ministry of Defence.
- **Vessel: Indian Army Sailing Vessel (IASV) Triveni**, an indigenously built sailing vessel.
- **Crew:** Women officers from the **Indian Army, Indian Navy, and Indian Air Force**.
- **Duration:** Around **9 months** (2025–26).
- **Distance Covered:** Approximately **25,500–26,000 nautical miles**.
- **Route Highlights:**
  - o Started and concluded at **Mumbai (Gateway of India)**.
  - o Crossed the **Equator twice**.
  - o Rounded the **Three Great Capes**:
    - Cape Leeuwin (Australia)
    - Cape Horn (South America)
    - Cape of Good Hope (South Africa)
  - o Navigated the **Southern Ocean** and **Drake Passage**, among the world's most challenging sea routes.

Operation Vajra: Tramadol Trafficking Foiled

Why in News?

The **Central Bureau of Narcotics (CBN)** seized **12 crore high-strength Tramadol Hydrochloride tablets** weighing around **30 tonnes** under **Operation Vajra**, preventing their diversion into illicit international channels.

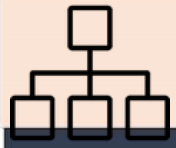
Key Facts

- **Tramadol:** A **synthetic opioid analgesic** used medically for pain relief; its misuse can lead to dependence and other health risks.
- **Quantity seized: 120 million tablets**, each containing **250 mg** Tramadol Hydrochloride.
- **Declared destination: Guinea-Bissau**; investigation indicated possible diversion to **Libya**.
- **Seizure location:** Warehouse in **Delhi**.
- **Operation:** Conducted by CBN, Gwalior, across **Bengaluru, Delhi and Kochi** during 10–20 July 2026.
- **Three key suspects** were arrested under the **NDPS Act, 1985**.

Institutional Framework

- **CBN:** Functions under the **Department of Revenue, Ministry of Finance**.
- Coordinated with the **Directorate of Revenue Intelligence (DRI)** and other agencies.

- Enforcement used **risk-based export profiling and intelligence inputs**.



GOVT. INITIATIVES, SCHEMES AND POLICIES, ORGANISATION

Samagra Shishu Bal Swasthya Karyakram (SSBSK)

Why in News?

The **Union Ministry of Health and Family Welfare** launched the **Samagra Shishu Bal Swasthya Karyakram (SSBSK)** during the **16th Conference of the Central Council of Health and Family Welfare (CCHFW)**. The programme integrates existing child healthcare initiatives into a unified framework to provide **continuum of care from birth to 36 months**, with a special focus on early childhood survival, nutrition, growth, and development.

About SSBSK

- A **national child health programme** under the **National Health Mission (NHM)**.
- Integrates:
  - o **Home-Based Newborn Care (HBNC)**
  - o **Home-Based Care for Young Child (HBYC)**
- Guided by the vision of **"Pehle Teen Saal Sampoorna Dekhbhal"** (Comprehensive Care in the First Three Years).

Key Features

- Covers children from **birth to 36 months** through **home and community-based care**.
- Introduces a **risk-stratified approach**:
  - o **At-risk newborns:** Up to **9 home visits** during the first **42 days**.
  - o **At-risk children:** Up to **8 additional home visits** up to **36 months**.
- Joint home visits by **ASHA**, **ANM**, **Community Health Officer (CHO)**, and **Anganwadi Worker (AWW)**.
- Introduces:
  - o **Well-Baby Sessions** at **Village Health, Sanitation and Nutrition Days (VHSNDs)**.
  - o Monthly **Shishu Shivir** at **Ayushman Arogya Mandirs**.
- Incorporates **post-partum maternal mental health screening**, **Early Childhood Development (ECD)**, and digital **Decision Support Systems (DSS)** for child tracking and referrals.

Atal Beemit Vyakti Kalyan Yojana (ABVKY)

Why in News?

The **Employees' State Insurance Corporation (ESIC)** has **extended the Atal Beemit Vyakti Kalyan Yojana (ABVKY) from 1 July 2026 to 30 June 2027**. The scheme provides **temporary financial assistance** to insured workers who lose their jobs involuntarily, ensuring social security during periods of unemployment.

About Atal Beemit Vyakti Kalyan Yojana (ABVKY)

- **Launched: 1 July 2018** on a pilot basis.
- **Implemented by: Employees' State Insurance Corporation (ESIC)**.
- **Nodal Ministry: Ministry of Labour & Employment**.
- **Objective:** Provide **cash compensation** to employees covered under the **Employees' State Insurance (ESI) Act, 1948**, who become unemployed due to reasons beyond their control.
- **Benefit:** Cash relief equal to **50% of the average daily wages** for a **maximum of 90 days** during unemployment.

Eligibility

- Must be an **ESI-insured person** in **insurable employment for at least 12 months** immediately before unemployment.
- Should have **contributed for at least 78 days** in one completed contribution period during the preceding 12 months.
- Benefit is **not available** if unemployment results from:
  - Misconduct
  - Lockout
  - Superannuation
  - Conviction for making false statements under the **ESI Act, 1948**.
- Claims are processed through **online submission** and **Direct Benefit Transfer (DBT)**.

National Apprenticeship Promotion Scheme-2 (NAPS-2)

Why in News?

The **Union Cabinet** approved the continuation of the **National Apprenticeship Promotion Scheme-2 (NAPS-2)** with enhanced financial support to expand apprenticeship opportunities, improve industry participation, and strengthen India's skilled workforce. The scheme aims to bridge the gap between education and industry while promoting employment-oriented training.

About National Apprenticeship Promotion Scheme-2 (NAPS-2)

- **Launched: 2022-23** as the **second phase** of the **National Apprenticeship Promotion Scheme (NAPS)**, originally launched in **2016**.
- **Nodal Ministry: Ministry of Skill Development and Entrepreneurship (MSDE)**.
- **Nature: Central Sector Scheme** implemented under the **Apprentices Act, 1961**.
- **Objective:** Promote apprenticeship training by encouraging establishments to engage apprentices and improve employability through industry-led skill development.

Key Features

- Government provides **partial stipend support** of **25% of the prescribed stipend**, subject to a maximum of **₹1,500 per apprentice per month**, through **Direct Benefit Transfer (DBT)**.
- Covers apprentices engaged in **designated and optional trades** across manufacturing and service sectors.
- Implemented through the **Apprenticeship India Portal** for registration, matching, monitoring, and certification.
- Promotes participation of **MSMEs, women, and underserved regions**, including targeted interventions for the **North-Eastern Region**.

Mission Vatsalya

Why in News?

The **Ministry of Women and Child Development (MWCD)** recently highlighted the progress of **Mission Vatsalya**, emphasizing the strengthening of **Child Care Institutions (CCIs)**, family-based care, rehabilitation services, and digital governance for children in need of care and protection.

About Mission Vatsalya

- **Launched:** 2021-22.
- **Nodal Ministry:** Ministry of Women and Child Development (MWCD).
- **Type: Centrally Sponsored Scheme (CSS)**.
- It subsumes the **Integrated Child Protection Scheme (ICPS)/Child Protection Services (CPS)**.
- **Vision:** Ensure every child enjoys a **safe, secure, healthy, and happy childhood** through a rights-based approach.

Key Features

- Promotes **family-based, non-institutional care**, with institutionalization as the **last resort**.
- Covers:
  - Child Care Institutions (CCIs)
  - Adoption services
  - Foster care
  - Sponsorship and aftercare
  - Child Welfare Committees (CWCs)
  - Juvenile Justice Boards (JJBs)
  - District Child Protection Units (DCPUs)
- Focuses on **children in need of care and protection (CNCP)** and **children in conflict with law (CCL)** under the **Juvenile Justice (Care and Protection of Children) Act, 2015**.

Kala Sanskriti Vikas Yojana (KSVY): Supporting India's Cultural Ecosystem

Why in News?

The **Ministry of Culture** is implementing the **Kala Sanskriti Vikas Yojana (KSVY)** to provide financial assistance for the preservation, promotion and dissemination of India's diverse cultural traditions.

Key Features

- **Nodal Ministry:** Ministry of Culture.
- KSVY is an **umbrella scheme** covering multiple components supporting cultural organisations, artists and institutions.
- Assistance is provided for activities related to:
  - **Performing arts**
  - Traditional and folk cultural forms
  - Cultural institutions and organisations
  - Festivals, productions and cultural programmes
  - Preservation and promotion of India's cultural heritage
- It supports both **established institutions and grassroots cultural practitioners**, helping sustain traditional art forms and cultural expressions.
- The scheme contributes to **cultural preservation, artist livelihoods and wider public access to heritage**.

Why Important?

India's cultural diversity includes numerous **folk, tribal, classical and traditional art forms** that face challenges from declining patronage and changing socio-economic conditions. KSVY provides institutional and financial support to sustain this cultural ecosystem.

SMILE Scheme: Towards a Begging-Free India

Why in News?

The **SMILE Scheme** has rehabilitated **over 10,200 persons engaged in begging across 216 cities**. The government aims to expand coverage to **295 cities** and rehabilitate **35,000 persons by FY 2030–31**.

Key Facts

- **SMILE:** *Support for Marginalized Individuals for Livelihood and Enterprise*.
- **Ministry:** Ministry of **Social Justice & Empowerment**.
- It includes the **Central Sector Scheme for Comprehensive Rehabilitation of Persons Engaged in the Act of Begging**.
- Focuses on:

- Identification and rescue
- Shelter and rehabilitation
- **Skill development & livelihood**
- Education and healthcare
- Counselling and social reintegration

- Implementation involves **Centre, States/UTs, District Administrations, Urban Local Bodies and implementing agencies**.
- **SMILE-Beggary National Portal** enables digital registration, monitoring and tracking of rehabilitation centres and shelter homes.

PARIVARTAN Scheme: Accelerating Sustainable Urban Transformation in India

Why in News?

The **PARIVARTAN Scheme** was recently launched by the **Ministry of Housing and Urban Affairs (MoHUA)** to strengthen the financial and institutional capacity of **Urban Local Bodies (ULBs)**. The scheme seeks to improve urban governance, enhance municipal service delivery, and promote sustainable and climate-resilient urban development through targeted reforms and capacity-building initiatives. (PIB)

Key Facts

- **PARIVARTAN** is a **Central Sector Scheme** implemented by the **Ministry of Housing and Urban Affairs (MoHUA)**.
- **Full Form: Planned Reforms and Innovation for Vibrant and Atmanirbhar Towns and Cities**.
- **Objectives:**
  - Strengthen the institutional and financial capacity of **Urban Local Bodies (ULBs)**.
  - Promote **urban governance reforms** and improve municipal administration.
  - Encourage **innovation**, digital governance, and evidence-based urban planning.
  - Improve the quality of urban infrastructure and public service delivery.
  - Build climate-resilient, inclusive, and citizen-centric cities.
- **Key Components:**
  - Capacity building of municipal officials.
  - Municipal finance reforms and improved revenue generation.
  - Adoption of digital technologies and e-governance.
  - Knowledge sharing, best practices, and innovation.
  - Technical assistance for urban planning and project implementation.
- The scheme complements flagship urban initiatives such as:
  - **AMRUT 2.0**
  - **Smart Cities Mission**
  - **Swachh Bharat Mission–Urban (SBM-U)**
  - **PM SVANidhi**

CapaCITIES Programme: Strengthening Urban Governance through Capacity Building

Why in News?

The **CapaCITIES (Capacity Building for Cities)** Programme was recently launched by the **Ministry of Housing and Urban Affairs (MoHUA)** to enhance the institutional and technical capacities of **Urban Local Bodies (ULBs)** across India. The initiative aims to equip city officials with modern skills for efficient urban planning, service delivery, and implementation of flagship urban missions.

Key Facts

- **CapaCITIES** is a **national capacity-building initiative** designed to strengthen the governance capabilities of India's cities.
- **Nodal Ministry: Ministry of Housing and Urban Affairs (MoHUA)**.
- **Implementing Partner: National Institute of Urban Affairs (NIUA)**, along with other knowledge and training institutions.
- **Objectives:**
  - Improve the institutional capacity of **Urban Local Bodies (ULBs)**.
  - Enhance skills in **urban planning, municipal finance, governance, digital transformation, climate resilience, and public service delivery**.
  - Promote **peer learning**, innovation, and adoption of best practices among cities.
  - Support effective implementation of urban flagship programmes.
- **Coverage Areas:**
  - Urban planning and land management.
  - Water supply and sanitation.
  - Solid waste management.
  - Digital governance and e-governance.
  - Climate-resilient and sustainable urban development.
- The programme complements initiatives such as:
  - **AMRUT 2.0**
  - **Smart Cities Mission**
  - **Swachh Bharat Mission–Urban (SBM-U)**
  - **PM Street Vendor's AtmaNirbhar Nidhi (PM SVANidhi)**.

MISCELLANEOUS

Nagori Ashwagandha: Rajasthan's GI-Tagged Medicinal Herb with Global Recognition

Why in News?

Nagori Ashwagandha, a premium medicinal plant variety from **Rajasthan**, gained international recognition after the **Prime Minister presented it as a GI-tagged gift during the G7 Summit in France**. The crop has also recently received a **Geographical Indication (GI) Tag (GI No. 1143)**, highlighting its unique medicinal qualities and regional identity.

About Nagori Ashwagandha

- A premium variety of **Ashwagandha (*Withania somnifera*)**, cultivated mainly in **Nagaur, Churu, and Bikaner districts** of Rajasthan.
- Grows under **arid to semi-arid climatic conditions** with **well-drained sandy soils**, which impart distinctive medicinal properties.

- Characterised by:
  - Long, thick, brittle, cavity-free roots
  - High starch content
  - Rich concentration of **withanolides** and **alkaloids**, making it highly valued by the herbal and pharmaceutical industries.

GI Tag & Significance

- Awarded the **Geographical Indication (GI) Tag** in **2026 (GI No. 1143)**.
- GI registration was supported by:
  - **ICAR–Directorate of Medicinal and Aromatic Plants Research (ICAR-DMAPR), Anand**
  - **National Medicinal Plants Board (NMPB)**
  - Department of Agriculture, Rajasthan
  - Nagori Welfare Society.
- The GI tag protects the crop's geographical identity, enhances export potential, preserves traditional knowledge, and improves farmers' incomes.

Shabdalok: India's First Immersive Language Museum

Why in News?

Shabdalok (Museum of Word), **India's first immersive language museum**, was inaugurated by **Union Home Minister Amit Shah** at the **National Library, Kolkata**. The museum has been established to celebrate India's rich linguistic diversity through interactive and technology-driven exhibits.

Key Facts

- **Name: Shabdalok (Museum of Word)**.
- **Location: National Library**, **Belvedere Estate**, **Kolkata, West Bengal**.
- **Developed by: National Library** under the **Ministry of Culture, Government of India**.
- **Significance:**
  - India's **first immersive museum dedicated to languages**.
  - Showcases the **evolution of Indian languages**, scripts, literature, and oral traditions.
  - Promotes awareness of India's multilingual and multicultural heritage.
- **Key Features:**
  - Interactive digital exhibits.
  - Immersive audio-visual galleries.
  - Displays on the evolution of scripts and writing systems.
  - Technology-enabled storytelling highlighting India's literary traditions.
  - Exhibits on classical, modern, and tribal languages.
- **Objective:**
  - Preserve and promote India's linguistic heritage.
  - Encourage appreciation of India's constitutional and cultural diversity.
  - Inspire younger generations through experiential learning using modern museum technologies.

SwaYaan Initiative

Why in News?

The **SwaYaan Initiative** has gained attention as a flagship programme promoting **indigenous assistive technologies** to enhance accessibility and independent mobility for persons with disabilities (PwDs). The initiative aligns with the Government's vision of **inclusive development** and **Atmanirbhar Bharat** by encouraging innovation in affordable rehabilitation technologies.

Key Facts

- **SwaYaan** is an initiative aimed at **designing, developing, and promoting indigenous assistive devices** for persons with disabilities.
- **Implemented by: Department of Empowerment of Persons with Disabilities (DEPwD)** under the **Ministry of Social Justice and Empowerment**, in collaboration with **Artificial Limbs Manufacturing Corporation of India (ALIMCO)** and leading academic and research institutions.
- **Objectives:**
  - Promote **accessible, affordable, and indigenous assistive technologies**.
  - Enhance **mobility, independence, and quality of life** for persons with disabilities.
  - Encourage **research, innovation, and start-ups** in rehabilitation technology.
  - Reduce dependence on imported assistive devices under the **Atmanirbhar Bharat** initiative.
- **Focus Areas:**
  - Smart wheelchairs
  - Prosthetic and orthotic devices
  - Mobility aids
  - Digital accessibility solutions
  - AI and IoT-enabled assistive technologies
- The initiative complements national programmes such as the **Accessible India Campaign (Sugamya Bharat Abhiyan)** and the **Rights of Persons with Disabilities Act, 2016**.

MAINS

PAPER 1

Raja Ravi Varma: The Father of Modern Indian Art

Introduction

Raja Ravi Varma (1848–1906) pioneered modern Indian art by blending **Indian themes with European academic realism**. His depictions of epics and sari-clad women became iconic, while his **lithographic press democratised art**, influencing Indian visual culture, cinema and popular art.

Early Life and Artistic Training

Aristocratic Background

- **Birth:** 29 April 1848, in Kilimanoor Palace, Travancore.
- **Family:** Born into a family of poets, scholars, and artists with royal connections; his mother was a poet and his siblings were also painters.
- **Early Talent:** He was discovered drawing on walls as a child; his uncle, Raja Raja Varma, gave him his first lessons.

Training and Influences

- **Patronage:** Received early patronage from the Maharajah of Travancore and began formal training in 1862.
- **Traditional Training:** Learned watercolour painting from the palace painter Rama Swamy Naidu.
- **Western Techniques:** Mastered oil painting by observing the Dutch painter Theodore Jenson, who was visiting the royal court. He also studied Italian paintings and other Western art available at the palace.

Artistic Career and Major Achievements

International Acclaim

- **Early Awards:** Won the Governor's Gold Medal at the Madras Fine Art Exhibition in 1873 for his painting *Nair Lady Adorning her Hair*.
- **Vienna Exhibition (1873):** Won the first prize, bringing him international recognition.
- **World's Columbian Exposition (Chicago, 1893):** Awarded two gold medals for his paintings.

Iconic Works and Themes

- **Mythological Narratives:** He is best known for his depictions of Hindu gods and goddesses and scenes from the epics, such as *Shakuntala*, *Damayanti*, and *The Disrobing of Draupadi*.
- **Humanising Divinity:** He used human models to create a relatable and realistic form for his vision of Hindu gods, a break from traditional, supernatural imagery.
- **Portraiture:** He was a celebrated portraitist, commissioned by royal patrons across India, including the Maharaja of Baroda and the Maharani of Travancore.
- **The "Ideal Indian Woman":** He created a composite, pan-Indian image of the traditional Indian woman, drawing from what he observed during his travels across the country, which became the most influential visual stereotype of its kind. His paintings are noted for their minute details, such as fabrics, jewellery, and furniture, and for using light and shadow to evoke mood.

The Mass Production of Art

- **Ravi Varma Press (1894):** He founded India's first chromolithographic press in Bombay (now Mumbai), importing German printing technology.
- **Oleographs:** The press produced affordable prints of his paintings, known as oleographs, which were varnished to look like oil paintings.

- **Democratising Art:** These prints made art, particularly images of gods and goddesses, accessible to the masses for the first time, as they were affordable for ordinary Indian homes. The press also challenged caste hierarchies by enabling everyone to buy prints of religious imagery.
- **Financial Struggles:** Despite its eventual impact, the press was not a financial success in his lifetime and was sold off to a German lithographer.

Legacy and Controversies

Enduring Impact on Indian Culture

- **Father of Modern Indian Art:** He is credited with modernising Indian painting by introducing Western techniques like oil painting and realism to Indian themes.
- **Popular Visual Culture:** His images of Hindu deities and mythological scenes have become the standard visual imagery for India's epics, influencing comic books (*Amar Chitra Katha*), calendar art, and even early Indian cinema (Dadasaheb Phalke).
- **Pan-India Presence:** He was one of the first Indian artists to have a pan-India presence and be recognised by aristocratic families and royals across the country.
- **Late Recognitions:** In 1904, he was bestowed the Kaisar-i-Hind Gold Medal by Lord Curzon. Many awards, cultural organisations, and festivals are now held in his memory.

Criticisms and Controversial Legacy

- **Artistic Merit:** His work has been criticized for being "kitsch" and for its lack of spiritual authenticity, with some art historians arguing that his sentimental, showy style was responsible for the "vulgarity" of popular calendar art.
- **Overshadowed Collaborators:** The focus on Ravi Varma has often led to the neglect of his talented contemporaries and collaborators, including his brother C. Raja Raja Varma, his sister Mangala Bayi, and several other artists who worked in his studio.
- **Modern Reinterpretations:** Despite criticism, his work remains important for modern and contemporary artists, who often reinterpret his paintings to interrogate his idealistic nationalism and depictions of women and goddesses.

Conclusion

Raja Ravi Varma revolutionised Indian art by blending **Western academic realism with Indian themes**. Through his paintings and printing press, he made art accessible to the masses and shaped India's **cinema, comics and calendar art**.

India's Demographic Transition: From Dividend to Ageing Challenge

Introduction

India has entered a new demographic phase, with **TFR falling to 1.9**, below the replacement level of 2.1. Yet population continues to grow due to **population momentum**, with **65% of Indians below 35**. This demographic dividend is temporary, as the **60+ population may reach 347 million by 2050**, raising concerns about ageing before prosperity.

The New Demographic Reality

Fertility Decline

- **TFR:** Dropped from 3.3 in the 2000s to 1.9 in 2024
- **Urban vs Rural:** Urban fertility at 1.5; rural at replacement level
- **State Disparities:** Delhi (1.2) and Kerala (1.3) vs Bihar (2.9) and Uttar Pradesh (2.6)

Population Growth Drivers

- **Population Momentum:** Large youth population entering childbearing years keeps births above deaths
- **Birth Rate (18.3 per 1,000) vs Death Rate (6.4 per 1,000):** Natural increase of ~1.19% per year
- **Life Expectancy:** Increased from 41 years (1950) to 72.7 years (2026)

The Demographic Window: Opportunity and Challenge

The Dividend Phase

- **Working-age population:** Currently large, but window expected to close by 2045-2055
- **Dependency ratio:** Falling until ~2039-40, then rising sharply
- **Youth population:** ~27% are aged 15-29 years

The Challenge: Ageing Before Prosperity

- **Elderly population:** 12% currently; projected to reach 20.5% by 2051
- **Support ratio decline:** From 8.4 working-age adults per elderly (2001) to 5.2 by 2026
- **Grey infrastructure deficit:** Healthcare systems designed for episodic care, not chronic disease management

Regional Disparities

- **Southern states:** Already ageing (Kerala's elderly at 20% vs national 12%)
- **Northern states:** Still young, but catching up rapidly

Risks and Policy Gaps

Economic Risks

- **Job creation deficit:** 13 million join workforce annually, but quality jobs are scarce
- **Wage stagnation:** Real wages have not kept pace; labour protests in Noida and Haryana reflect growing discontent
- **Middle-income trap:** Latin American examples show risk of failing to convert demographic window into sustained prosperity

Social and Institutional Gaps

- **Care economy:** 94% of elderly care is within households; unpaid care work by women (305 minutes/day) remains a barrier to workforce participation
- **Education-employability mismatch:** Only 55% of graduates considered employable
- **Health transition:** Double burden of infectious diseases and NCDs (diabetes, hypertension)

Policy Imperatives

Invest in Human Capital

- **Skill development:** Shift to "hyper-local vocational hubs" aligned with industry needs
- **Healthcare redesign:** Strengthen geriatric care; integrate NCD management at primary level
- **Education:** Link curricula with emerging employment opportunities

Leverage the Care Economy

- **Formalise care sector:** Invest 2% of GDP could create ~11 million jobs, largely for rural women
- **"Neighbourhood of care" model:** Connect existing rural institutions (Gram Panchayats, SHGs, ASHAs) into a community care network

Harness Technology and Migration

- **Digital Public Infrastructure:** Create a "Unified Labour Ledger" for portable social security for migrant workers
- **Global Labour Mobility:** Align skills with ageing economies in Europe and East Asia

Conclusion

India faces a demographic paradox: **falling fertility alongside continued population growth**, with only **20–25 years** to harness its demographic dividend. As southern states age rapidly, India must urgently invest in **health, education, skilling, quality jobs and social security** to avoid growing old before growing rich.

PAPER 2

Yes and No: The Erosion of India's Grassroots Democracy

Introduction

A new Rural Development Ministry report reveals the erosion of grassroots democracy despite official claims of vibrant local governance. Though empowered by the 73rd Amendment, gram sabhas have become scheme-approval bodies with limited autonomy. Low participation reflects poor outcomes and livelihood constraints, while proposed digital and procedural reforms fail to address deeper structural issues, including weak fiscal powers of panchayats.

Understanding the Crisis: Key Findings from the Report

Participation Fatigue and Low Engagement

- **Citizen Disengagement:** "Participation fatigue" keeps citizens away from gram sabhas

- **Lack of Outcomes:** 18-28% respondents cited no results as reason for low interest
- **Livelihood Barriers:** More than half of participation barriers related to precarious rural labour and economic exclusion
- **Elite Capture:** Gram sabhas remain "playground for the leisured elite" (landlords, contractors)

Structural Constraints on Panchayats

- **Limited Taxation Power:** Panchayats systematically constrained from raising taxes
- **Dependence on Grants:** Finance Commissions tied spending to central priorities (Jal Jeevan, Swachh Bharat)
- **Time Allocation:** Only 13% of time spent identifying local issues; just 4% discussing revenue generation
- **No Incentive:** Citizens see little reason to attend if funds are earmarked by Delhi bureaucrats

Digital Solutions vs. Ground Realities

- **NIRNAY App:** Pushed for real-time upload of minutes
- **Practical Problem:** Panchayat secretaries have less time facilitating discussion
- **Systemic Issue:** Officials tell workers MGNREGA demands "not entered" due to server errors
- **Oversight Gaps:** Lacklustre oversight allows such exclusions

The PESA Act and Right to Say 'No'

Legal Empowerment

- **PESA Act (1996):** Provisions of Panchayats (Extension to Scheduled Areas) Act
- **Forest Rights Laws:** Gram sabhas have right to provide prior informed consent for land acquisition and mining
- **Constitutional Mandate:** 73rd Amendment empowers gram sabhas as deliberative bodies

Bypass of Rights

- **State Practice:** Routine bypass of gram sabha consent
- **Manufactured Consent:** Low participation used as excuse to override
- **Hasdeo Arand Protests:** Rooted in this issue—communities denied right to say 'no'
- **Fundamental Question:** If 'yes' must be the only answer, the report's grouses are a farce

The Missing Right

- **Constitutional Gap:** No explicit right to withhold consent
- **Implementation Failure:** Even existing powers are routinely violated
- **Need for Recognition:** State must acknowledge gram sabhas have right to say 'no'
- **Grassroots Democracy:** Cannot exist without consent being meaningful

Way Forward: Strengthening Grassroots Democracy

Restoring Fiscal Autonomy

- **Taxation Powers:** Amend laws to allow panchayats to raise local taxes
- **Untied Grants:** Provide untied funds for local priorities
- **Revenue Generation:** Dedicate time in gram sabhas for revenue discussions
- **Incentive Alignment:** Link participation to tangible local outcomes

Making Participation Meaningful

- **Livelihood Integration:** Address economic barriers to participation
- **Paid Attendance:** Institutionalise attendance as paid component of social protection
- **Outcome Focus:** Ensure gram sabha decisions translate into visible local development
- **Transparency:** Real-time access to funds, decisions, and outcomes

Honouring PESA and Consent Rights

- **Mandatory Consent:** Gram sabha approval must be mandatory for land acquisition and mining

- **Right to Say 'No':** Explicitly acknowledge and enforce gram sabha's right to withhold consent
- **Protect Deliberation:** Ensure physical and legal space for genuine deliberation
- **Address Hasdeo Arand Precedents:** Learn from conflicts where consent was ignored

Strengthening Oversight and Accountability

- **Independent Monitoring:** Third-party oversight of gram sabha functioning
- **Grievance Redressal:** Fast-track mechanisms for violations of gram sabha rights
- **Capacity Building:** Train panchayat secretaries and officials in facilitation and participatory governance
- **Judicial Oversight:** Ensure courts enforce PESA and forest rights provisions

Digital with a Human Face

- **Appropriate Technology:** Use NIRNAY app to enhance, not replace, deliberation
- **Offline Access:** Ensure digital solutions do not exclude non-literate or offline communities
- **Data Transparency:** Real-time upload must be coupled with easy citizen access
- **Feedback Loops:** Ensure digital platforms enable two-way communication

Conclusion

The Rural Development Ministry report highlights declining grassroots democracy but overlooks the core problem: gram sabhas lack real authority and fiscal autonomy. Procedural reforms alone cannot revive participation. Genuine decentralisation, stronger financial powers, respect for consent rights under PESA, and meaningful local decision-making are essential to fulfil the vision of the 73rd Amendment.

FCRA Bill 2026: A Threat to Civil Society Organisations

Introduction

FCRA Amendment Bill, 2026: The Bill proposes a **Designated Authority** to take over assets created from foreign contributions when registration is cancelled or surrendered. Critics fear this could increase **state control over CSOs, religious and charitable institutions**, raising concerns over institutional autonomy and civil liberties.

Key Provisions: FCRA Amendment Bill, 2026

- **Asset Vesting:** Foreign-funded assets may provisionally and eventually permanently vest with the government after registration cancellation.
- **Automatic Cessation:** Registration ends automatically if renewal is not sought or granted.
- **Wider Liability:** Directors, trustees and other key functionaries may face personal liability.
- **Activity/State Registration:** Organisations must specify approved activities and States/UTs of operation.
- **Enhanced Disclosures:** Greater project-wise reporting and disclosure of donors, officials and publications.
- **Restrictions:** Foreign funds cannot be used for **proselytisation or political content**.
- **Centralised Investigations:** State agencies need Central Government approval for FCRA investigations.
- **Penalties:** Maximum imprisonment reduced to **1 year**, while liability extends to misuse of funds.

Concerns & Criticisms

- **Civil Society Impact:** Asset vesting and registration cancellations may disrupt schools, hospitals, NGOs and minority institutions.
- **Constitutional Concerns:** Critics cite possible violations of **Articles 14, 19, 25–26, 30 and 300A**.
- **Executive Discretion:** Broad “public interest” grounds and limited transparency may enable arbitrary action.
- **Federal Concerns:** Greater central control raises questions over **federalism and state autonomy**.
- **Compliance Burden:** Activity/state-specific registration and enhanced reporting may disproportionately affect small NGOs.
- **Uneven Regulation:** Critics argue charities face stricter FCRA scrutiny than certain foreign-invested companies.

Government's Justification

- **Transparency and Sovereignty:** MHA defends FCRA as a transparency and disclosure framework, not a ban, citing 16,200 active associations received ₹22,963 crore in 2024-25.
- **Global Precedents:** The government cites US FARA, UK FIRS, Canada FITAA, and EU proposals to argue India is aligned with global practices.
- **National Security:** Provisions are necessary to prevent misuse of foreign funds for activities detrimental to national interest.

Counter-Arguments

- **Disproportionate and Punitive:** Critics argue the Bill is not merely regulatory but punitive and confiscatory, far beyond global models.
- **Chilling Effect:** The Bill creates a chilling effect on legitimate advocacy, rights work, and faith-based charity, discouraging donors and volunteers.
- **Implementation Gaps:** Even if the law is reasonable, opaque cancellations, delays, and lack of independent appeals undermine its legitimacy.

Way Forward

- **Due Process:** Narrow asset-vesting powers and ensure judicial oversight.
- **Fair Regulation:** Differentiate minor lapses from serious violations and impose proportionate penalties.
- **Clear Definitions:** Precisely define “proselytisation,” “political content” and “public interest.”
- **Transparency:** Provide reasons for cancellations and fixed timelines for approvals/renewals.
- **Independent Appeals:** Establish an impartial appellate mechanism.
- **Constitutional Safeguards:** Protect minority, religious and property rights under **Articles 25, 26, 29, 30 and 300A**.
- **Stakeholder Consultation:** Involve civil society and provide adequate transition time.

Conclusion

The **FCRA Amendment Bill, 2026** significantly expands state control over foreign-funded civil society. While transparency and sovereignty are valid concerns, **asset vesting without judicial review, automatic cessation and vague restrictions** may disproportionately burden NGOs and charitable institutions. The government should ensure **proportionate regulation, due process, stakeholder consultation and constitutional safeguards**.

Forced Labour Tariffs: A Trade Deal Trap for India

Introduction

The U.S. **10% tariff on Indian imports** under Section 301, linked to forced-labour concerns, raises questions about penalising countries for third-party trade. Though India secured a reduction from the proposed **12.5% tariff**, uncertainty remains due to other U.S. investigations. India should pursue **strategic trade negotiations** without allowing unpredictable tariff policies to dictate its choices.

Understanding the U.S. Tariff Move

Context: Supreme Court Blow to Trade Deals

- **February 2026:** U.S. Supreme Court decision undermined U.S. efforts to secure trade deals.
- **Previous Threat:** High reciprocal tariffs removed.
- **Temporary Tariffs:** Trump's 10% tariff on all countries expired after 150 days; had no deal-specific benefits.

Section 301 "Forced Labour" Tariffs

- **Permanent Nature:** More enduring than temporary tariffs.
- **Deal-Based Benefits:** EU and Taiwan face total 10%; India faces base tariff + 10%. Japan, South Korea, Switzerland have similar benefits with deals in progress.

- **Purpose:** Inconsistent with stopping forced labour (tariffs not applied equally); includes product-wise exemptions and country-wise quotas.

Inconsistencies

- **Penalising Third-Party Trade:** India not accused of forced labour, yet penalized because others have been.
- **Not "World Police":** U.S. recently told court it didn't want to act as "world police," yet penalizes others for third-party issues.

India's Response and Options

Reduction in Tariff Rate

- **Proposed:** 12.5% tariffs.
- **Final:** Reduced to 10% (same as or better than competitors).
- **Action Taken:** Issued notification banning import of goods made using forced labour.
- **Enforcement Challenge:** Requires Indian officials to investigate labour conditions in countries like China and Malaysia.

Ongoing and Future Uncertainty

- **Section 301 Investigation on Excess Capacity:** Yet to play out; could result in additional tariffs.
- **Trade Deal Premise:** Highly unlikely India will accept a deal until excess capacity tariffs are clear.

Strategic Caution

- **Experience:** U.S. tariff landscape can change radically even after a deal is signed.
- **Recommendation:** India should not be pushed into a trade deal by these tariffs.

Strengths of India's Position

- **Diplomatic Agility:** Successfully reduced tariffs from 12.5% to 10% through a simple notification.
- **Principled Stand:** Refusing to be pushed into a deal until all tariff uncertainties are resolved.
- **Legal and Economic Consistency:** Highlighting the inconsistency of penalizing countries not accused of forced labour.

Risks

- **Enforcement Infeasibility:** Indian officials investigating labour conditions in China/Malaysia is politically and practically difficult.
- **Uncertainty:** Pending excess capacity investigation creates long-term trade unpredictability.
- **Economic Cost:** 10% tariff on U.S. imports of Indian goods could affect exports.
- **Diplomatic Pressure:** Potential isolation if other countries sign deals.

Way Forward

Short-Term Strategy

- **Maintain Current Stand:** Do not commit to a trade deal until excess capacity tariffs are clear.
- **Strengthen Enforcement:** Develop credible mechanisms for the forced labour import ban.
- **Engage Diplomatically:** Use WTO and bilateral channels to question the consistency of U.S. tariffs.

Long-Term Strategy

- **Diversify Markets:** Reduce dependence on the U.S. market by strengthening trade with other partners (e.g., EU, ASEAN, Africa).
- **Domestic Manufacturing:** Boost competitiveness through PLI schemes and infrastructure.
- **Trade Agreement Caution:** Learn from history; ensure any future U.S. deal includes dispute resolution and tariff predictability.

Policy Recommendations

- **Evidence-Based Negotiations:** Document and present India's strong track record on labour rights and trade compliance.

- **Support Exporters:** Mitigate tariff impact through export incentives and market diversification support.
- **Legal Recourse:** Explore WTO dispute settlement if tariffs are found discriminatory or inconsistent.

Conclusion

The U.S. Section 301 tariffs raise concerns about **unfair trade pressure**, especially as India was not accused of forced labour. While reducing the tariff from **12.5% to 10%** is a diplomatic gain, further investigations create uncertainty. India should avoid rushed deals and pursue a **cautious strategy focused on market diversification and domestic manufacturing**.

Start-up Village Entrepreneurship Programme: Catalysing Rural Economies

Introduction

The **Start-up Village Entrepreneurship Programme (SVEP)**, launched in 2016 under DAY-NRLM, promotes rural non-farm enterprises through training, finance, mentoring, and community support. By June 2026, it had supported **4.32 lakh enterprises**, with **86% benefiting SC, ST, Minority and OBC communities**. QCI found **99% of enterprises profitable**, contributing **57% of household income**, while women owned or managed **75%** of them. SVEP is thus fostering **inclusive rural entrepreneurship and sustainable livelihoods**.

Understanding SVEP: Structure and Approach

Programme Overview

- **Launched:** 2016 under DAY-NRLM
- **Focus:** Non-farm enterprises in rural areas
- **Target Group:** SHG members and their families
- **Support:** Financial assistance, training, mentoring, business development services
- **Community-Based:** Local decision-making for funding and support

Implementation Framework

- **Block Resource Centres–Enterprise Promotion (BRC-EPs):** Coordinate at block level
- **Community Resource Persons–Enterprise Promotion (CRP-EPs):** Technical assistance; selected locally (90% from SHG households; 60% women)
- **Community Enterprise Fund (CEF):** Loans managed by community institutions
- **Convergence:** Linkages with PM MUDRA and other schemes
- **Digital Tools:** Business planning, loan appraisal, enterprise tracking

Funding and Scale

- **Cumulative Central Share (up to Feb 2026):** ₹942.09 crore
- **Growth:** 738% increase from ₹112.39 crore (2016-Jan 2018)
- **Average Investment:** ₹27,083 per enterprise
- **Provision:** ₹6.50 crore per block
- **Enterprises Supported:** 4.32 lakh (as of June 30, 2026)
- **Top States:** Assam, Bihar, Jharkhand, West Bengal, Madhya Pradesh

Impact and Social Inclusion

QCI Mid-Term Evaluation Findings (2019)

- **Profitability:** 99% of enterprises profitable
- **Income Contribution:** 57% of total household income
- **Average Monthly Revenue:** ~₹39,000 (Manufacturing: ₹47,800)
- **Savings:** 96% entrepreneurs reported increased savings
- **Women Ownership:** 75% enterprises owned or managed by women
- **Confidence:** Improved confidence and livelihood security
- **Social Benefits:** Better education, nutrition, health, sanitation outcomes

Social Inclusion

- **Community Coverage:** 86% entrepreneurs from SC, ST, Minority, OBC
- **Women Focus:** Minimum 60% women beneficiaries
- **First-Generation Entrepreneurs:** Encouraged women and disadvantaged communities
- **Persons with Disabilities:** Representation mandated
- **Livelihood Security:** Improved financial and business skills

Success Stories

Ms. Bhagyashri Londhe (Maharashtra)

- **Background:** SHG member (2014); started small-scale masala, papad, pickles
- **Intervention:** ₹45,000 CEF loan under SVEP
- **Outcome:** Scaled production; ₹5 lakh revenue in 10 days at Mahalaxmi Saras 2019-20; completed Class 10 while managing enterprise; created employment for rural women

Ms. Poonam (Uttar Pradesh)

- **Background:** SHG member; overcame social/financial barriers
- **Intervention:** 54-day CRP-EP training programme
- **Outcome:** Became Best Performing CRP-EP; supports nearly 40 enterprises; financial independence; helps others establish and grow businesses

Challenges

- **Awareness:** Limited reach in remote or difficult areas
- **Market Linkages:** Access to markets beyond local level
- **Skill Gaps:** Continuous upskilling needed for changing markets
- **Financial Sustainability:** Dependence on government funding; need for self-sustaining model
- **Scale:** 4.32 lakh enterprises against vast rural population
- **Quality of Training:** Uniform quality across diverse CRP-EPs

Way Forward

Strengthening Enterprise Ecosystem

- **Market Access:** Link with eSARAS, ONDC, GeM for rural products
- **Technology:** Promote digital payments, e-commerce, and AI-based advisory
- **Value Addition:** Support food processing, agro-processing, and crafts
- **Cluster Development:** Encourage enterprise clusters for economies of scale

Enhancing Financial and Institutional Support

- **Credit Access:** Strengthen linkages with banks and PM MUDRA
- **Community Enterprise Fund:** Increase corpus and simplify access
- **Handholding:** Extend mentoring beyond initial phase
- **Insurance:** Cover enterprise risks

Capacity Building

- **CRP-EP Training:** Regular refresher courses; advanced modules
- **Digital Literacy:** Train entrepreneurs in digital tools
- **Soft Skills:** Leadership, negotiation, and financial management
- **Peer Learning:** Establish entrepreneur networks and forums

Policy and Monitoring

- **State-Level Support:** Empower SRLMs for faster implementation
- **Impact Assessment:** Regular evaluation (QCI model)
- **Grievance Redressal:** Fast-track mechanism for entrepreneurs

- **Awareness:** Use SHG networks and community radio for outreach

Conclusion

SVEP has emerged as a transformative model for **inclusive rural entrepreneurship**, supporting **4.32 lakh enterprises**, with **86% from SC/ST/Minority/OBC communities** and **75% women-owned**. With **99% profitability**, it demonstrates the potential of SHG-led enterprises to drive livelihoods and inclusive growth. However, challenges in **market linkages, skills, finance, and scaling** persist. Strengthening enterprise ecosystems, capacity building, and digital tools can help SVEP advance the vision of **Viksit Bharat**.

Due Process and Police Accountability: Lessons from Jantar Mantar

Introduction

The Jantar Mantar protests and the police crackdown on July 20, 2026, have raised concerns over **excessive use of force and citizens' rights**. Alleged violations of proportionality and the Supreme Court's **Ramlila Maidan guidelines** highlight the need for accountability. In a democracy, **due process and judicial scrutiny are essential to prevent the misuse of state power** and protect citizens' rights.

The Protest and Police Response: Context and Concerns

Nature of Protests

- **Primarily Students:** Young protesters, demanding accountability for exam leaks and systemic issues
- **Trigger:** NEET-UG 2026 paper leak; broader discontent with education governance
- **Duration:** Protests ongoing; crackdown on July 20, 2026
- **Violence by Protesters:** Small section resorted to stone-pelting, physical assault on journalists (strongly condemned)

Alleged Police Excesses (as per reports)

- **Disproportionate Force:** Use of pellet guns, tear gas shells, lathi charges
- **Protocol Violations:** Alleged flouting of Delhi Police Standing Order 309 and 152
- **SC Guidelines (Ramlila Maidan, 2012):** Principle of "least invasiveness" reportedly not observed
- **Tear Gas:** Allegedly fired directly into crowds, not away from them

Judicial and Legal Context

- **CJI's Observation:** "Don't waste our time"; "We are not interested in videos"
- **Social Media Age:** Words travel far; CJI's earlier choice of words sparked the "Cockroach Janta Party" satire
- **High Court:** Agreed to hear two PILs on police excesses; fair and independent probe needed

Legal Framework: Due Process and Police Accountability

Constitutional and Statutory Safeguards

- **Article 19(1)(a) & (b):** Freedom of speech and peaceful assembly (subject to reasonable restrictions)
- **Article 21:** Protection of life and personal liberty; prohibits arbitrary state action
- **Criminal Procedure Code (CrPC), 1973:** Guidelines for arrest, detention, and use of force
- **Police Standing Orders:** Delhi Police Standing Order 309 and 152 (specific protocols for crowd control)

Supreme Court Guidelines (Ramlila Maidan Incident, 2012)

- **Principle of "Least Invasiveness":** Force must be proportionate; last resort
- **Procedural Compliance:** Water cannons before more injurious methods; tear gas away from crowd
- **Accountability:** Actions must be documented; courts can inquire into violations
- **State's Role:** State cannot weaponise rulebook to suppress peaceful dissent

Due Process and Judicial Role

- **Oral Observations vs. Final Orders:** CJI's "don't waste time" was oral; but words have impact
- **Access to Justice:** Courts must be open to those alleging rights violations

- **Procedural Fairness:** Even if some protesters used violence, larger context of police excess must be examined
- **Social Media Challenge:** Courts need to balance authenticity concerns with accessibility

Concerns

- **CJI's Remarks:** Perceived as dismissive, widening citizen-institution gap
- **Police Accountability:** Lack of transparent inquiry into protocol violations
- **Disproportionate Force:** Use of pellet guns against students raises serious concerns
- **Contextual Blindness:** Failure to distinguish between peaceful protesters and violent elements
- **Social Media Polarisation:** Authenticity concerns used to dismiss legitimate grievances

The Unequal Clash

- **Power Asymmetry:** State has vast resources; citizens have limited means
- **Weaponisation of Rules:** Rulebook can be used to justify excess
- **Citizen Vulnerability:** Students, youth, marginalised groups are most affected
- **Need for Justice:** Courts must ensure state actions are lawful and proportionate

Way Forward

Judicial Response

- **Dismissive Remarks:** Avoid oral observations that seem dismissive; acknowledge access concerns
- **Fast-Track PILs:** Ensure timely hearing of police excess cases
- **Procedural Fairness:** Even if some protesters violent, examine whether police followed protocols
- **Social Media Evidence:** Develop mechanisms to verify and consider digital evidence

Police Accountability

- **Independent Inquiry:** Fair and transparent probe into July 20 crackdown
- **Protocol Compliance:** Investigate if Standing Orders and Ramlila Maidan guidelines were followed
- **Action:** Hold officers accountable for excesses; protect whistleblowers
- **Training:** Reinforce crowd control training with emphasis on "least invasiveness"

Citizen-State Dialogue

- **Government Assurances:** Must be backed by transparent action, not just statements
- **Student Engagement:** Address grievances (exam leaks, education reforms) substantively
- **Protest Rights:** Respect peaceful assembly; distinguish from violence
- **Media Freedom:** Protect journalists covering protests

Institutional Reforms

- **Exam Security:** Strengthen processes to prevent leaks; ensure convictions
- **Police Protocols:** Regular review and update of Standing Orders
- **Grievance Redressal:** Fast-track mechanism for police excess complaints
- **Judicial Outreach:** Build trust through accessible and empathetic judicial discourse

Conclusion

The Jantar Mantar protests highlight the need to balance **public order with citizens' rights**. Alleged disproportionate use of force and violations of established protocols demand an **independent investigation**. While the state must address violence, legitimate grievances should not be suppressed. **Due process, judicial accessibility, and proportionality remain essential to democratic accountability.**

Delhi-Tokyo Ties Face the Future: A Strategic Partnership for a Changing Indo-Pacific

Introduction

Japanese Prime Minister Sanae Takaichi's visit to India comes amid uncertainty over the U.S. approach to the Indo-Pacific. In this context, the India–Japan partnership assumes greater strategic importance. Japan's strengths

in technology, investment, and defence complement India's rise, while both countries share concerns over China's assertiveness and seek resilient supply chains in areas such as semiconductors and rare earths. Their cooperation is vital for promoting a stable, secure, and rules-based Indo-Pacific.

Geopolitical Context: Shifting US Approach

From Coalitions to Transactions

- **Trump 1.0:** Confrontational towards China; invested in regional coalitions
- **Trump 2.0:** Favours transactional, one-on-one engagement over coalition-building
- **Symbolic Shift:** Pentagon reverted INDOPACOM to PACOM
- **Strategic Narrowing:** 2025 National Security Strategy narrows US core interests in Indo-Pacific
- **Trump-Xi Summit:** Fuels concerns about US reliability as a long-term partner

Implications for Asian Countries

- **Uncertainty:** Wary of US commitment to regional security architecture
- **Strategic Autonomy:** Asian nations seek diversified partnerships
- **China's Opportunity:** Perceived US retrenchment emboldens Beijing
- **India's Calculus:** Need to accelerate military/technological modernisation and deepen regional partnerships

India-Japan Strategic Convergence

Shared Security Concerns

- **India's Perspective:** Unresolved border with China
- **Japan's Perspective:** Maritime and territorial disputes in East China Sea
- **China's Assertiveness:** Common concern driving strategic alignment
- **Indo-Pacific Vision:** Both committed to free, open, and rules-based order

Economic and Technological Cooperation

- **Reducing Dependence:** Both seek to reduce reliance on Chinese technologies and rare earths
- **Complementary Strengths:**
  - Japan: Capital, advanced manufacturing, semiconductor expertise
  - India: Scale, software talent, vast market
- **Value Chains:** Coordinated strategy can shape future global value chains
- **Technology Pillar:** Semiconductors, rare earths, advanced manufacturing, digital infrastructure

Military and Strategic Cooperation

- **Japan's Growing Military Power:** Unique capacity to complement India's rise
- **Defence Exercises:** Regular bilateral and multilateral exercises
- **Technology Transfer:** Potential for joint development of defence equipment
- **Supply Chain Resilience:** Strategic coordination on critical technologies and materials

India's Strategy in a Changing Indo-Pacific

Strengthening Strategic Partnerships

- **Japan as Key Partner:** Deep-rooted ties; regular summit-level engagement
- **Quad Cooperation:** India, Japan, US, Australia as flexible coalition
- **ASEAN and Pacific Islands:** Broader regional engagement
- **Neighbourhood First:** Balancing China's influence in South Asia

Military and Technological Modernisation

- **Accelerated Defence Modernisation:** Indigenous production (Make in India)
- **Cyber and Space:** Emerging domains of cooperation
- **Critical Technologies:** AI, quantum, semiconductors, rare earths

- **Self-Reliance:** Reducing dependence on Chinese supply chains

Diplomatic and Economic Initiatives

- **Indo-Pacific Economic Framework:** Participation in regional economic architecture
- **Supply Chain Resilience:** Diversifying away from China
- **Infrastructure Development:** Partnership for quality infrastructure in third countries
- **Multilateral Forums:** G20, SCO, BRICS, UNSC reform

Challenges and Limitations

- **China Factor:** Economic interdependence with China (especially Japan)
- **Implementation Gaps:** Technology transfer and investment often lag behind declarations
- **Domestic Constraints:** Political and economic pressures within both countries
- **US Role:** Over-reliance on American security umbrella; India's strategic autonomy
- **Regional Diversity:** Different threat perceptions and priorities within Indo-Pacific

Way Forward

Strengthening Bilateral Cooperation

- **Regular Summits:** Institutionalise annual leader-level meetings
- **Defence Technology:** Joint development and production of advanced systems
- **Civil Nuclear:** Explore civil nuclear cooperation (ongoing negotiations)
- **Space:** Expand joint space exploration and satellite development

Deepening Economic and Technological Partnership

- **Semiconductors:** Collaborate on design, manufacturing, and supply chain
- **Rare Earths:** Joint exploration and processing to reduce Chinese dependence
- **Digital Infrastructure:** Share India's DPI (UPI, Aadhaar) and Japan's tech expertise
- **Startup Ecosystem:** Foster India-Japan startup collaboration and investment

Strategic and Military Coordination

- **QUAD Framework:** Strengthen and institutionalise QUAD cooperation
- **Maritime Security:** Coordinated patrols and information sharing
- **Cybersecurity:** Joint exercises and capacity building
- **Indo-Pacific Infrastructure:** Collaborate on quality infrastructure in third countries

Diplomatic and Multilateral Engagement

- **UNSC Reform:** Joint advocacy for expansion and representation
- **ASEAN Centrality:** Coordinate engagement with Southeast Asia
- **Pacific Island States:** Collaborate on climate change and sustainable development
- **G20 and BRICS:** Align positions on global governance issues

Building Resilience

- **Supply Chain Diversification:** Reduce over-dependence on China
- **Crisis Management:** Develop mechanisms for joint response to regional crises
- **Communication:** Regular dialogue to address mutual concerns and build trust
- **People-to-People Ties:** Expand cultural, educational, and tourism exchanges

Conclusion

Prime Minister Sanae Takaichi's visit underscores the growing strategic importance of the India–Japan partnership amid evolving Indo-Pacific geopolitics. Shared concerns over China's assertiveness, cooperation in critical technologies such as semiconductors and rare earths, and a common commitment to a free and rules-based Indo-Pacific make the partnership a key pillar of regional stability. Deepening defence, technology, and economic cooperation will strengthen India's strategic capabilities and resilience in a changing regional order.

PM's Indonesia Visit: Foundations of Nickel Diplomacy

Introduction

Prime Minister Modi's visit to Indonesia (July 6–8, 2026) highlights India's push to strengthen ties with a key maritime partner. As the world's largest archipelagic state with vast nickel reserves, Indonesia is central to India's clean energy and EV ambitions. The visit builds on the 2018 Comprehensive Strategic Partnership, focusing on critical minerals, defence, connectivity, and maritime security.

Strategic Significance of the Visit

Critical Minerals and Clean Energy

- **Nickel Reserves:** Indonesia holds world's largest nickel reserves
- **Strategic Importance:** Essential for EV batteries and clean energy transition
- **Chinese Dominance:** Beijing has established dominant position in downstream processing
- **Urgency:** India has limited time to secure presence in nickel value chain
- **Other Minerals:** Indonesia also possesses cobalt, bauxite, tin, and rare earths

Defence and Maritime Cooperation

- **BrahMos Missiles:** Substantial progress expected towards acquisition by Indonesia
- **Maritime Security:** Shared boundary in Andaman Sea; Indonesia straddles Malacca Strait
- **Sabang Port:** Strategic potential in Aceh province under Act East Policy
- **Regional Stability:** Shared interest in preserving freedom of navigation, ASEAN centrality
- **India's Role:** Western approach of Malacca Strait guarded by India

Shared Historical and Strategic Ties

- **Ancient Links:** Indian cultural connections with Java, Bali, Sumatra
- **Bandung Conference (1955):** Foundation of Non-Aligned Movement
- **Largest Democracies in Asia:** Shared democratic values
- **BRICS and IORA:** Common platforms for advancing shared interests
- **UNGA Camaraderie:** Decades of diplomatic trust from alphabetic seating

Economic and Commercial Dimensions

Bilateral Trade and Investment

- **Indonesia:** India's second-largest ASEAN trading partner
- **Trade Deficit:** India runs ~US$20 billion deficit
- **Target:** Expand bilateral trade to US$100 billion by 2030
- **Critical Mineral Strategy:** Need for joint ventures, upstream equity, mineral-processing partnerships
- **Industry Challenge:** Indian companies must match speed of Chinese counterparts

Connectivity Gaps

- **Limited Direct Flights:** Constrains people-to-people ties
- **Inadequate Shipping Links:** Hampers trade and connectivity
- **Restrictive Visa Protocols:** Limits tourism and business travel
- **Potential:** Initiatives linking Andaman & Nicobar with Aceh need momentum

Sectors for Cooperation

- **Digital Public Infrastructure:** India's DPI expertise
- **Healthcare and Space:** Emerging areas of collaboration
- **Tourism:** Unexplored potential
- **Supply Chain Resilience:** Critical minerals and rare earths

Geopolitical Context

China's Maritime Assertiveness

- **Nine-Dash Line:** Overlaps Indonesia's EEZ around Natuna Islands
- **Chinese Investment:** Dominant in nickel processing; strategic concern for India
- **India's Response:** Quad arrangements; bilateral cooperation
- **Indonesia's Balancing:** Close economic ties with China, expanding maritime cooperation with India

India's Indo-Pacific Strategy

- **ASEAN Centrality:** Indonesia as leading voice and partner
- **Act East Policy:** Aligns with Indonesia's maritime ambitions
- **Comprehensive Strategic Partnership (2018):** Framework for cooperation
- **Indo-Pacific Vision:** Shared interest in stable, rules-based order

BRICS and Multilateral Cooperation

- **Indonesia's BRICS Membership:** Expands engagement platforms
- **Indian Ocean Rim Association:** Common membership
- **UNSC Reform:** Potential coordination
- **Climate Action:** Shared vulnerability and interests

Challenges

- **Chinese Competition:** Beijing's head start and deep investment in Indonesia
- **Trade Deficit:** Economic ties below potential
- **Connectivity:** Infrastructure gaps limit engagement
- **Implementation:** Translating agreements into tangible outcomes
- **Geopolitical Balancing:** Indonesia's ties with China
- **Domestic Capacity:** Indian industry must act swiftly

Way Forward

Critical Minerals Strategy

- **Joint Ventures:** Indian companies must partner in mining and processing
- **Equity Stakes:** Acquire upstream assets in nickel and other minerals
- **Processing Partnerships:** Establish joint processing facilities
- **R&D:** Collaborate on battery technology and recycling

Strengthening Defence and Maritime Ties

- **Finalise BrahMos Deal:** Strengthen Indonesia's deterrent capability
- **Maritime Exercises:** Expand joint patrols and exercises
- **Maritime Domain Awareness:** Share information on Malacca Strait and Andaman Sea
- **Infrastructure:** Develop Sabang port and other strategic facilities

Economic and Connectivity Enhancement

- **Improve Direct Flights:** Increase frequency and routes
- **Shipping Links:** Enhance maritime connectivity
- **Visa Liberalisation:** Simplify travel for business and tourism
- **Target US$100 Billion:** Framework for doubling trade by 2030

Multilateral and Regional Cooperation

- **ASEAN-India Cooperation:** Strengthen engagement through Indonesia
- **Quad and Indo-Pacific:** Coordinate with Indonesia where possible
- **BRICS and IORA:** Advance shared interests
- **Climate and Energy:** Collaborate on sustainable transition

Conclusion

PM Modi's Indonesia visit underscores India's effort to deepen ties with a key maritime partner. Securing access to Indonesia's nickel reserves is vital for India's clean energy goals, while defence cooperation, connectivity, and maritime security remain key priorities. The visit's success will depend on concrete progress in critical minerals, defence, and economic cooperation, strengthening regional stability and India's strategic interests.

On Indo-Pacific: Delhi Must Match Words with Actions

Introduction

PM Modi's six-day visit to **Indonesia, Australia, and New Zealand** comes amid growing regional uncertainty and China's rising assertiveness. The tour aims to strengthen India's role through deeper strategic, economic, and defence ties, including Sabang port development, BrahMos exports, and FTA negotiations. However, its success will depend on effective implementation of these initiatives.

The Tour: Key Outcomes

Indonesia (July 6-8)

- **Sabang Port:** Decision to accelerate development—strengthens logistics, maritime domain awareness, naval cooperation
- **Defence Cooperation:** Progress on BrahMos missile sale—highlights India's defence export potential in Southeast Asia
- **Strategic Context:** China's "Nine-Dash Line" overlaps Indonesia's Natuna EEZ

Australia

- **FTA Talks:** Decision to begin comprehensive FTA negotiations
- **Nuclear Cooperation:** Administrative arrangements completed for Australian uranium exports—supports India's nuclear power expansion
- **Critical Minerals:** Australia's vast reserves for India's industrial growth
- **Maritime Cooperation:** Enhanced eastern Indian Ocean collaboration

New Zealand

- **Ends Diplomatic Neglect:** First high-level engagement in years
- **FTA Concluded:** Recently finalised trade agreement
- **Maritime Cooperation:** Expanded engagement
- **South Pacific:** Platform for greater engagement where China's presence is growing

The Implementation Gap: Words vs. Actions

Historical Underperformance

- **ASEAN Trade (2000-2025):**
  - India: $7 billion → $125 billion
  - China: $40 billion → nearly $1 trillion
- **Connectivity:** Lagging behind China
- **Technology & Defence:** Potential not fully realised

Case Studies of Delay

- **Sabang Port:** Discussions began nearly a decade ago
- **Australian Uranium:** Administrative arrangements took years to finalise
- **New Zealand Engagement:** Prolonged diplomatic neglect

Domestic Constraints

- **Bureaucratic Delays:** Slow decision-making and implementation
- **Inter-Ministerial Coordination:** Lack of synergy
- **Infrastructure:** Inadequate domestic capacity for major projects
- **Regulatory Hurdles:** Complex approval processes

Persistent Gaps

- **Implementation Deficit:** Celebrating visits, neglecting follow-through
- **China's Comparative Pace:** Faster, deeper engagement with ASEAN
- **Bureaucratic Inertia:** Slows strategic projects
- **Resource Constraints:** Limited capacity for large-scale infrastructure
- **Domestic Politics:** Diverts attention from foreign policy implementation

Way Forward

Strengthening Domestic Implementation Machinery

- **Project Management:** Dedicated units for foreign projects (Sabang, uranium, etc.)
- **Inter-Ministerial Coordination:** Strengthen mechanisms for seamless implementation
- **Public-Private Partnerships:** Leverage private sector for infrastructure
- **Regulatory Reforms:** Simplify approval processes

Prioritising Key Initiatives

- **Sabang Port:** Set clear timelines and milestones
- **FTA with Australia:** Accelerate negotiations
- **Nuclear Cooperation:** Ensure uranium supply arrangements are operational
- **Maritime Security:** Operationalise agreements with Indonesia, Australia, New Zealand

Expanding India's Footprint

- **ASEAN:** Move beyond trade to connectivity, technology, defence
- **South Pacific:** Follow New Zealand engagement with broader outreach
- **Indo-Pacific Architecture:** Strengthen QUAD and bilateral frameworks

Balancing China

- **Strategic Autonomy:** Maintain independent posture
- **Infrastructure:** Build credible alternatives to Chinese projects
- **Defence Cooperation:** Expand security partnerships

Conclusion

PM Modi's Pacific tour reflects India's push to deepen strategic and economic ties with **Indonesia, Australia, and New Zealand**. However, its success will depend on timely implementation of projects and reforms. Bridging execution gaps is essential for India to translate strategic intent into lasting regional influence.

Poshan Tracker: India's Real-Time Nutrition Monitoring Platform

Introduction

Launched in 2021 under **Mission Saksham Anganwadi and Poshan 2.0**, Poshan Tracker is a mobile-based platform for real-time nutrition monitoring. It digitises Anganwadi records, enables Aadhaar-based beneficiary verification, growth monitoring, and data-driven decision-making. Covering over **8.9 crore beneficiaries**, it has earned national and global recognition as a flagship **Digital India** initiative.

Understanding Poshan Tracker: Features and Functions

Digital Transformation of Nutrition Governance

- **Before:** 11 manual registers; delayed decision-making; inconsistent assessments
- **After:** Unified digital platform; real-time monitoring; evidence-based governance
- **Coverage:** 28 States + 8 UTs; 8.93 crore beneficiaries (May 2026)

Key Technology Features

- **Aadhaar-Based Verification:** Prevents leakages; eliminates ghost entries
- **Facial Recognition System (FRS):** Last-mile tracking; service delivery authenticity

- **IT-Enabled Home Visit Scheduler:** 23 structured home visits with auto-scheduling and counselling prompts
- **ECCE Content Delivery:** 249 videos, 190 voice notes, 159 PDFs based on Aadharshila (National ECCE Curriculum)
- **Poshan Calculator:** WHO Child Growth Standards; tracks stunting, wasting, underweight, SAM/MAM, obesity
- **Poshan Helpline:** 1515 for grievance registration

Beneficiary Coverage (May 2026)

- **Registered Beneficiaries:** 8.93 crore
- **Children (0-5 years) Growth Monitoring:** 6.3 crore (~94% of registered)
- **Supplementary Nutrition Programme (SNP):** 5.5 crore (15+ days); 5.17 crore (21+ days)
- **Live Monthly Database:** 7.7 crore children with Aadhaar-authenticated data

Institutional Framework and Integration

Mission Poshan 2.0 (Mission Saksham Anganwadi and Poshan 2.0)

- **Consolidation:** Poshan Abhiyan, Anganwadi Services, Scheme for Adolescent Girls (Budget 2021-22)
- **Components:** Nutrition support; Early Childhood Care and Education (3-6 years); Anganwadi infrastructure upgradation
- **Saksham Anganwadi:** Modern amenities (LED screens, water purifiers, smart learning aids, Poshan Vatikas)

Aadharshila (National ECCE Curriculum)

- **Launched:** March 2024
- **Focus:** Play-based learning (toys, art, music, storytelling) for children aged 3-6 years
- **Goal:** Cognitive, social, emotional, physical development; school readiness for Grade 1

Infrastructure and Training

- **Smartphones:** All Anganwadi Workers equipped; connectivity charges ₹2,000/annum
- **Growth Monitoring Devices:** Provided at each Anganwadi Centre
- **Training:** "Train the Trainer" model; state coordinators; virtual interactions

Impact and Recognition

Operational Impact

- **Dynamic Monitoring:** Real-time dashboards, heat maps for evidence-based policy
- **Last-Mile Tracking:** FRS and Aadhaar ensure service delivery authenticity
- **Improved Efficiency:** Replaced manual registers; reduced service gaps
- **Nutrition Outcomes:** Dynamic identification of stunting, wasting, underweight

National and International Recognition

- **WHO:** Cited as exemplary nutrition data ecosystem
- **UNICEF:** Appreciated simplicity and beneficiary tracking
- **G20 Ministerial Conference (2023):** Recognized in Chair's Statement for nutrition monitoring and ECCE
- **Prime Minister's Award for Excellence in Public Administration (April 2025)**
- **National e-Governance Award (Gold) – 27th National Conference (September 2024)**

Challenges

- **Digital Divide:** Smartphone and connectivity access for all AWWs
- **Data Quality:** Accuracy and timeliness of data entry
- **Capacity Building:** Continuous training for 13.35 lakh Anganwadi Centres
- **Integration:** Linking with other health and nutrition platforms

- **Sustainability:** Infrastructure maintenance and updates

Way Forward

Strengthening Technology

- Enhance offline capabilities for low-connectivity areas
- Integrate with other health DPIs (ABDM, UPI)
- Use AI/ML for predictive analytics and early warning

Capacity Building

- Continuous training for Anganwadi Workers in digital tools
- Strengthen data quality and validation mechanisms
- Expand ECCE content and home visit protocols

Integration and Convergence

- Link with health and ICDS schemes
- Integrate with ABDM for child health records
- Strengthen convergence with other ministries (Health, Education)

Sustainability and Scale

- Ensure regular updating of hardware and software
- Expand coverage to all beneficiaries
- Develop community awareness and engagement

Conclusion

Poshan Tracker has transformed nutrition governance through real-time monitoring, digital record-keeping, and data-driven decision-making for over **8.9 crore beneficiaries**. As a flagship **Digital India** initiative, it should further strengthen technology integration, capacity building, and inclusive implementation to support a well-nourished **Viksit Bharat**.

AI + DPI: The Next Governance Leap

Introduction

Integrating AI with India's Digital Public Infrastructure (DPI) can significantly enhance state capacity. Leveraging vast datasets from Aadhaar, UPI, GST, and FASTag, AI can improve service delivery, multilingual access, interoperability, and data-driven governance. This positions India to become a global leader in population-scale AI applications and digital governance.

India's Data Revolution: From Data Poor to Data Rich

The Three Bold Acts (2016)

- **Jio:** Democratised internet access
- **UPI:** Catalysed digital payments (42% of world's transactions)
- **GST:** Created real-time visibility into supply chains, invoicing, production, consumption

India as the World's Largest Natural Data Laboratory

- **UPI:** 23 billion monthly transactions – one of world's largest behavioural datasets
- **GST:** 20 crore payments – real-time economic visibility
- **FASTag:** 4.5 billion transactions – mobility and logistics datasets
- **Aadhaar:** 27 billion annual authentications – 16-fold expansion in DBT beneficiaries

Significance

- **First Developing Country:** Using population-scale digital data to accelerate development
- **Real-Time Insights:** Conventional statistical systems bypassed
- **Potential:** Rigorous research, think tanks, open data commons emerging

AI + DPI: Reimagining the Indian State

Historical Context: Weak State Capacity

- **Challenge:** Failed transition from farm to non-farm jobs
- **Government Spending:** Increased 53,000 times since 1947 (₹198 crore to ₹10.5 lakh crore)
- **Limitation:** More structures/personnel not enough

DPI's Achievements and Limitations

- **Achievements:** Better resource allocation, service delivery, fraud detection, quicker responses
- **Limitations:** Interoperability gaps (digital silos stronger than physical), weak internal tech capacity, PDF mentality instead of APIs

AI's Transformative Potential

- **Unstructured Data:** AI can integrate data across silos
- **Consent Architecture:** Works within strong framework and Jan Vishwas Siddhant
- **Multiple Languages:** Opens labour and education markets
- **Public Health:** Improves expenditure efficiency
- **Global First:** India will be first large country to integrate AI into population-scale DPI

Jan Vishwas and Citizen Interface

- **Current:** Only 11% of connected Indians use internet for government services (vs. 66% for entertainment)
- **Goal:** Reimagined citizen interface with trust and ease
- **NCAER Research:** Shows gap between digital access and governance use

AI Deployment: The Use-Case Capital of the World

AI Generation vs. AI Deployment

- **Generation:** Building AI models (India lacks credible horse in this race)
- **Deployment:** Applying AI in daily lives – more ingenuity, organisational savviness, human capital
- **Analogy:** Don't need to build a car to drive it; build the roads (applications)

Enterprise DPI Under Implementation

- **Components:** Universal enterprise number, entity DigiLocker, API Setu, single source of truth for regulation
- **Vision:** Combine with Universal Lifetime Social Security Account (Aadhaar punji)
- **Impact:** Formalisation revolution similar to NPCI in payments

Expected Benefits

- **Reduce Information Asymmetry:** Better credit allocation, worker-job matching
- **Lower Transaction Costs:** Improved supply chain, logistics efficiency
- **High-Wage Jobs:** Accelerate creation of private, non-farm employment

Global Context

- **America:** AI built on private-sector data ecosystems
- **China:** AI built on platform-centric digital ecosystems
- **India:** AI on population-scale DPI – unique global position

Way Forward

Policy and Institutional

- **Open Data Commons:** Well-funded think tanks, rigorous research
- **Interoperability:** Move from PDFs to APIs
- **Jan Vishwas Siddhant:** Implement trust-based governance principles
- **Capacity Building:** Strengthen government's internal tech capacity

Technology Integration

- **AI for Unstructured Data:** Integrate across silos

- **Multiple Language Interfaces:** Expand labour and education markets
- **Enterprise DPI:** Complete implementation
- **Universal Social Security Account:** Aadhaar punji for every citizen

Economic and Social Impact

- **Formalisation:** Reduce informal economy
- **Credit Access:** Improve allocation to MSMEs and individuals
- **Job Matching:** Better worker-job alignment
- **State Capacity:** Enhanced resource allocation, service delivery

Conclusion

India's vast Digital Public Infrastructure provides a strong foundation for AI-driven governance. Integrating AI with DPI can improve service delivery, multilingual access, interoperability, and state capacity. By scaling AI on public digital infrastructure, India can strengthen governance, accelerate economic formalisation, and drive inclusive growth.

Empowering India's Skill Ecosystem: From Classroom to Enterprise

Introduction

India's skill ecosystem is evolving through an integrated approach linking education, skilling, employment, and entrepreneurship. With a large young workforce and rising employability, initiatives such as **PMKVY 4.0**, **PM Vishwakarma**, and **FutureSkills Prime** aim to build a future-ready workforce and help realise the goal of a fully skilled workforce by **2047**.

Early Skilling: Building Foundations from School

Integration in School Education

- **Samagra Shiksha Scheme:** 138 job roles approved; 25,140 schools covering 35.5 lakh students; Hub & Spoke model (975 spoke schools)
- **Skill Labs:** 1,200 vocational skill labs in 400 JNVs and 200 EMRSs (by MSDE)
- **PM SHRI Schools:** 13,092 developed across 776 districts (out of 14,500 targeted)
- **Atal Tinkering Laboratories:** 10,000+ ATLs established in 722 districts; 1.1 crore+ students engaged
- **Vidyanjali Programme:** 8,44,925 schools onboarded; 5,62,296 volunteers; 2.04 crore students benefited

AI and Future Skills for Youth

- **SOAR (Skilling for AI Readiness):** 2.30 lakh students enrolled (Classes VI-XII)
- **YUVA AI for ALL:** 85.27 lakh enrolments (free 4.5-hour self-paced course)
- **National Skills Qualifications Framework (NSQF):** Competency-based framework integrating academic and vocational education

Upskilling and Re-skilling the Workforce

Pradhan Mantri Kaushal Vikas Yojana (PMKVY 4.0)

- **Trained:** 28.17 lakh candidates across 36 sectors, 738 districts (as of June 2026)
- **Future-Ready Courses:** 68 customised courses; 189 future-skill job roles
- **Network:** 16,900+ institutions, including 6,800+ Skill Hubs
- **Sectoral Focus:** IT-ITeS, aerospace, agriculture, rubber, leather, apparel, electronics, construction, tourism

Other Flagship Schemes

- **Jan Shikshan Sansthan (JSS):** 36.52 lakh beneficiaries trained (82% women); 4.8 lakh tribal beneficiaries
- **National Apprenticeship Promotion Scheme (NAPS 2.0):** 54.41 lakh apprentices engaged; ₹562.75 crore DBT disbursed
- **Craftsmen Training Scheme (CTS):** 14.70 lakh enrolments in 13,888 ITIs (169 courses)

PM-SETU (Pradhan Mantri Skilling and Employability Transformation)

Objective: Upgrade 1,000 Government ITIs (200 Hub + 800 Spoke) over 5 years; train 20 lakh youth
Status: 32 States constituted Steering Committees; SIPs worth ₹1,237.58 crore approved for Odisha, Gujarat, Telangana

FutureSkills and Digital Platforms

- **FutureSkills Prime:** 33 lakh+ registered users; 2,800+ courses; 41% women learners; reach in 740 Tier 2/3 cities
- **Skill India Digital Hub (SIDH):** Digital backbone; 32 lakh+ candidates enrolled; 1,000+ courses in 23 languages

Entrepreneurship and Special Initiatives

PM Vishwakarma (Artisans and Craftspeople)

- **Basic Training Completed:** 24.50 lakh beneficiaries
- **Loans Sanctioned:** ₹5,165.84 crore
- **Digital Incentive:** ₹35+ crore disbursed
- **Inclusivity:** SC/ST/OBC, PwD, transgender, NER, island territories

Women-Centric Skilling

- **NAVYA (Adolescent Girls):** Targeting 3,850 girls in 27 aspirational districts across 19 States
- **AI Careers for Women:** 10,000+ students reached (2,500 Hub + 7,500 Spoke)
- **Swavalambini:** Entrepreneurship programme in Assam, Meghalaya, Mizoram, UP, Telangana; 602 candidates trained

Startup India and Entrepreneurship

- **Startup India Courses:** Free online courses (Programming, Security, Accounting, Management)
- **ESDPs (MSME):** Technical and business skills for SC/ST, women, PwD, ex-servicemen, BPL

PM Viksit Bharat Rozgar Yojana (PMVBRY)

- **Objective:** Support first-time employees and employers
- **Worker Incentive:** Up to ₹15,000 (two instalments) for first-time EPFO registrants
- **Employer Incentive:** Up to ₹3,000/month for 2 years for additional employees (6+ months sustained employment)
- **Achievement (19 June 2026):** 15 lakh employment opportunities created; ₹2,400 crore incentives disbursed

Budget 2026-27: Key Skilling Initiatives

- **Khelo India Mission:** Integrated talent pathway, coach development, sports science
- **Tourist Guides:** Upskilling 10,000 guides through 12-week hybrid course
- **National Institute of Design:** In eastern India
- **AVGC Content Creator Labs:** In 15,000 schools and 500 colleges
- **Geriatric Care Training:** 1.5 lakh multi-skilled caregivers (NSQF-aligned)
- **University Townships:** 5 near industrial/logistics corridors (education + research + skilling + residential)

Challenges

- **Quality vs. Quantity:** Need for consistent quality across 16,900+ training centres
- **Industry Alignment:** Rapid tech changes require continuous course updates
- **Placement:** Training must translate into sustained employment
- **Infrastructure:** ITI upgradation under PM-SETU needs faster rollout
- **Rural Access:** Digital divide remains; offline and regional language support needed
- **Recognition:** NSQF implementation across sectors and states is uneven

Way Forward

Strengthening Quality and Industry Linkages

- **Regular Course Updates:** Align with AI, green jobs, and Industry 4.0
- **Industry-Academia Partnerships:** Expand apprenticeships and on-the-job training
- **Quality Assurance:** Strengthen assessment and certification mechanisms
- **Sector Skill Councils:** Enhance their role in curriculum design

Expanding Reach and Inclusivity

- **PM-SETU:** Accelerate rollout of upgraded ITIs and Centres of Excellence
- **Rural and Remote Areas:** Expand Skill Hubs and digital infrastructure
- **Women and Marginalised:** Scale up AI Careers for Women, NAVYA, and JSS
- **Aspirational Districts:** Target 27 districts with NAVYA and other schemes

Leveraging Technology and Innovation

- **AI and Emerging Tech:** Scale up YUVA AI, SOAR, and FutureSkills Prime
- **Skill India Digital Hub:** Integrate all skilling schemes for seamless access
- **Credentialing:** Expand use of digital credentials and National Skills Passport

International Mobility

- **Global Talent Hub:** Leverage surplus of 45 million skilled professionals by 2030
- **Mutual Recognition:** Negotiate agreements for skill qualifications abroad
- **GCCs:** Position India as hub for Global Capability Centres

Conclusion

India's skill ecosystem has strengthened through rising employability and initiatives like **PMKVY 4.0**, **FutureSkills Prime**, and **PM Vishwakarma**. However, improving training quality, industry alignment, and rural access remains essential. Sustained investment in technology, quality skilling, and global partnerships will be key to realising the vision of a fully skilled workforce by **2047**.

PAPER 3

Nine Years of GST: Simplifying Taxation, Strengthening India

Introduction

Introduced on **1 July 2017**, **GST** unified India's indirect tax system under **"One Nation, One Tax."** With **GST 2.0 (2025)**, rates and compliance were simplified. Taxpayer registrations rose from **66.5 lakh** to **1.65 crore**, while collections increased from **₹7.4 lakh crore** to **₹22.27 lakh crore (2025–26)**, boosting formalisation, cooperative federalism, and economic growth.

Understanding GST: Structure and Salient Features

Key Features

- **Tax on Supply:** GST levied on "supply" of goods/services, not on manufacture, sale, or service separately
- **Destination-Based Consumption Tax:** Tax accrues to State where goods/services are finally consumed
- **Dual GST:** CGST (Centre) + SGST (State) on intra-state; IGST on inter-state supplies
- **Coverage:** Applies to almost all goods/services; alcoholic liquor kept outside; 5 goods subject to future GST Council approval
- **GST Council:** Statutory body ensuring Centre-State cooperative decision-making

Institutional Framework

- **GSTN (50% Centre: 50% State):** Provides common digital infrastructure for GST system

- **GST Council:** Reviews issues, responds to challenges, enables timely course corrections
- **Digital Systems:** E-invoicing, real-time data capture, AI/ML for monitoring

Next-Generation GST Reforms (GST 2.0)

Streamlined Rate Structure

- **Primary Slabs:** Reduced to 5% and 18%
- **Luxury and Sin Goods:** 40% rate on lottery/online gaming, tobacco, aerated drinks, high-end cars, yachts, private aircrafts
- **Exemptions:** Insurance and essential medicines exempted to protect households and improve healthcare access

Compliance Simplification

- **Easier Registration:** Ease-based scheme; low-risk applicants get registration within 3 working days
- **Simpler Returns:** Quarterly Return Filing and Monthly Payment (QRMP) for turnover up to ₹5 crore; NIL returns via SMS
- **Relief in Disputes:** Reduced pre-deposit for appeals; waiver of interest/penalties for FY 2017-18 to 2019-20
- **Small Taxpayers:** Registration exemption for intra-state e-commerce sellers; MSME-focused measures

Sectoral Impact

- **Households:** Cheaper goods/services; exemptions on insurance and essential medicines
- **MSMEs:** Reduced rates on inputs (cement, handicrafts); lower production costs; simplified structure reduces classification disputes
- **Exports:** Correction of inverted duty structures boosts domestic value addition and competitiveness
- **Farmers & Artisans:** Relief through lower rates and simpler compliance

Impact and Achievements

Taxpayer Base and Collections

- **Taxpayers:** 66.5 lakh (2017) to 1.65 crore (May 2026)
- **Gross Collections:** ₹7.4 lakh crore (2017-18) to ₹22.27 lakh crore (2025-26)
- **Recent Momentum:** ₹4.37 lakh crore (April-May 2026)
- **Revenue Buoyancy:** Strong collections reflect economic formalisation and compliance improvement

Formalisation and Compliance

- **Increased Tax Base:** Wider taxpayer participation indicates formalisation
- **Technology-Driven Admin:** GSTN, e-invoicing, AI/ML for evasion detection
- **Pre-filled Returns:** Real-time validation reduces errors and manual reporting
- **Risk-Based Monitoring:** AI identifies evasion patterns; focus on high-risk taxpayers

Cooperative Federalism

- **GST Council:** Regular reviews; timely changes and course corrections
- **Centre-State Coordination:** Dual GST structure; revenue sharing mechanisms
- **Compensation Provisions:** Transition support for states (as per GST Compensation Act)

Economic Impact

- **Common National Market:** Removed interstate tax barriers
- **Lower Compliance Costs:** Streamlined processes for businesses
- **Boost to Consumption:** Cheaper goods/services drive demand
- **Macro Stability:** Predictable collections support fiscal transparency

Challenges

- **Complexity:** Though simplified, multiple slabs and compliance still burdensome for some MSMEs

- **Revenue Neutrality:** Some states face revenue gaps; compensation issues
- **Technology Gaps:** Digital divide affects small taxpayers; connectivity issues
- **Compliance Burden:** Quarterly/ monthly filings still demanding for smallest businesses
- **Anti-Profiteering:** Enforcement challenges in passing benefits to consumers
- **Litigation:** Disputes on classification, valuation, and interpretation persist

Way Forward

Further Rate Rationalisation

- Consolidate remaining slabs (28%) into 18% with appropriate revenue adjustments
- Expand exemptions for essential goods and services
- Consider further relief for MSMEs and exporters

Strengthening Technology

- Enhance GSTN portal for user-friendliness and scalability
- Expand AI/ML for real-time compliance monitoring
- Integrate with other digital platforms (UPI, GeM)
- Provide offline/ low-bandwidth solutions for remote areas

Easing Compliance for MSMEs

- Further simplify QRMP scheme
- Reduce compliance frequency for smallest taxpayers
- Provide sector-specific compliance guides
- Strengthen grievance redressal mechanisms

Dispute Resolution and Litigation

- Strengthen advance ruling mechanism
- Reduce litigation through clear circulars and clarifications
- Fast-track GST appellate tribunals
- Provide amnesty schemes for past disputes

Fiscal Federalism

- Ensure adequate compensation to states during transition
- Strengthen state-level GST administration
- Improve revenue forecasting and sharing mechanisms
- Address state-specific concerns through GST Council

Conclusion

After nine years, **GST** has transformed India's indirect tax system by improving tax compliance, formalising the economy, and boosting revenue. While reforms such as **GST 2.0** have simplified the framework, continued rate rationalisation, technological upgrades, and cooperative federalism are essential to support **Viksit Bharat**.

Pradhan Mantri Krishi Sinchayee Yojana: A Decade of Irrigation-Led Transformation

Introduction

Launched on **1 July 2015**, **Pradhan Mantri Krishi Sinchayee Yojana (PMKSY)** has transformed irrigation and water-use efficiency in Indian agriculture. The scheme has benefited **over 27 million farmers**, created irrigation potential across **24.61 million hectares**, and brought **110.92 lakh hectares** under micro-irrigation. With a **₹6,587 crore allocation in Budget 2026–27**, PMKSY continues to strengthen water security, agricultural productivity, and sustainable farming.

Understanding PMKSY: Objectives and Components

Vision and Goals

- **Objective:** Expand assured irrigation, improve on-farm water efficiency, promote sustainable water conservation
- **Approach:** Jal Sanchay (rainwater harvesting/storage) + Jal Sinchan (efficient water application)
- **Impact:** Enhanced productivity, climate resilience, environmental sustainability, improved soil health

Four Strategic Components

Accelerated Irrigation Benefit Programme (AIBP)

- Focus: Rapid completion of ongoing major and medium irrigation projects
- Central Assistance: ₹21,023 crore (since 2016-17)
- Beneficiaries: 17.30 million farmers (largest component by coverage)
- New Sub-Scheme (2025-26): Modernization of Command Area Development and Water Management (M-CADWM) – initial outlay ₹1,600 crore

Har Khet Ko Pani (HKKP)

- Focus: Creating new water sources through minor irrigation (surface and groundwater)
- Achievements: 3,462 Surface Minor Irrigation and RRR schemes completed
- Irrigation Potential Created: 5.93 lakh hectares (surface) + 88.55 thousand hectares (groundwater)

Watershed Development

- Focus: Enhancing productive potential of rainfed and degraded lands
- Central Assistance: ₹12,432.09 crore (since 2016-17)
- Beneficiaries: 1.34 million farmers

Per Drop More Crop (PDMC)

- Focus: Maximising water use efficiency through micro-irrigation
- Technologies: Drip and sprinkler irrigation systems
- Financial Assistance: 55% for small/marginal farmers; 45% for others
- Coverage: 110.92 lakh hectares under micro-irrigation (~7.98% of net sown area)
- Annual Reach: 9.3 lakh farmers

Institutional Support

- **Micro Irrigation Fund:** Established under NABARD for promoting MI adoption
- **Continuation (2021-26):** Overall outlay ₹93,068.56 crore
- **Budget 2026-27:** ₹6,587 crore allocation

Impact and Achievements

Scale of Reach

- **Farmers Benefited:** 27 million+
- **Irrigation Potential Created/Restored:** 24.61 million hectares
- **Central Assistance:** ₹64,407 crore
- **Micro-Irrigation Coverage:** 110.92 lakh hectares

Success Story: Barabanki, Uttar Pradesh

- **Brothers:** Uma Shankar Verma and Subhash Verma (farming since 1990s)
- **Traditional Method:** Flood irrigation (high water, labour, uneven growth)
- **Adoption (2016):** Sprinkler irrigation under PMKSY
- **Results:**
    - Crop yields increased 25-30%
    - Water, electricity, labour, fertilizer use reduced ~50%
    - Labour requirements fell 50-60%
    - Fertilizer consumption reduced to one-fourth

- Profits: ₹60,000-70,000 per hectare
- **Ripple Effect:** Encouraged neighbouring farmers to adopt sprinkler irrigation

Formalisation and Compliance

- **Water-Use Efficiency:** Micro-irrigation delivers water directly to roots, reducing waste
- **Climate Resilience:** Efficient irrigation supports sustainable farming
- **Environmental Benefits:** Reduced water extraction; improved soil health
- **Inclusive Growth:** Small and marginal farmers receive higher subsidies

Challenges

- **Scale Gap:** Micro-irrigation covers only ~8% of net sown area; potential remains untapped
- **Adoption Barriers:** High initial costs; limited awareness; fragmented landholdings
- **Infrastructure Gaps:** M-CADWM implementation pending; water storage deficits
- **Water Availability:** Overexploitation of groundwater in some regions
- **Maintenance:** Sustainability of created infrastructure (canals, micro-irrigation systems)
- **Regional Disparities:** Uneven coverage across states; rainfed areas still vulnerable
- **Inter-State Issues:** River water sharing disputes affect AIBP projects

Way Forward

Expanding Micro-Irrigation

- Target: Cover 50% of net sown area by 2030
- Simplify subsidy access and ensure timely disbursement
- Promote affordable micro-irrigation solutions for small farmers
- Develop farmer-friendly financing through NABARD and banks

Strengthening Infrastructure

- Complete ongoing AIBP projects on priority
- Implement M-CADWM effectively for command area development
- Invest in water harvesting and storage structures (check dams, farm ponds)
- Upgrade and maintain existing irrigation infrastructure

Water-Use Efficiency and Conservation

- Promote precision irrigation technologies (sensors, automation)
- Encourage crop diversification to less water-intensive crops
- Integrate watershed development with micro-irrigation
- Adopt conjunctive use of surface and groundwater

Institutional and Policy Reforms

- Strengthen Water User Associations (WUAs) for participatory management
- Implement groundwater regulation and pricing reforms
- Enhance convergence with other schemes (MGNREGA, PMFBY)
- Build farmer capacity through training and demonstrations

Research and Innovation

- Invest in climate-resilient irrigation technologies
- Develop drought-tolerant and water-efficient crop varieties
- Use satellite/remote sensing for irrigation planning and monitoring
- Promote solar-powered irrigation systems

Conclusion

After a decade, **PMKSY** has significantly expanded irrigation, improved water-use efficiency, and enhanced farmers' incomes through initiatives such as micro-irrigation and watershed development. However,

challenges like regional disparities, infrastructure gaps, and low adoption persist. Strengthening irrigation infrastructure, expanding micro-irrigation, and promoting sustainable water management will be crucial for achieving **Viksit Bharat @2047**.

The Rupee is No Longer Overvalued: Implications for India

Introduction

The rupee has shifted from overvalued to undervalued, with the REER falling from 108.03 (Nov 2024) to 89.08 (May 2026). Its undervaluation is now greater than the yuan's, potentially enhancing India's export and manufacturing competitiveness. However, the extent of these gains will depend on global economic and geopolitical conditions.

Understanding Currency Valuation: NEER and REER

Nominal Effective Exchange Rate (NEER)

- **Definition:** Weighted average of rupee's exchange rates against a basket of 40 currencies of India's major trade partners (88% of trade flows)
- **Base Year:** 2015-16 = 100
- **NEER (May 2026):** 77.19 – record low; rupee fell ~22.8% against trade partners' currencies since base year

Real Effective Exchange Rate (REER)

- **Definition:** NEER adjusted for inflation differentials between India and its trading partners
- **True Measure:** Indicates whether rupee is undervalued, overvalued, or fairly valued
- **REER (November 2024):** 108.03 – **overvalued by ~8%**
- **REER (May 2026):** 89.08 – **undervalued by ~11%**
- **REER (June 2026):** 91.26 – still undervalued by ~8.7%

Why REER Matters

- **If REER > 100:** Currency overvalued; exports less competitive; imports cheaper
- **If REER < 100:** Currency undervalued; exports more competitive; imports costlier
- **Inflation Impact:** If rupee depreciates less than domestic inflation, it appreciates in "real" terms

The Rupee's Journey: From Overvalued to Undervalued

Key Exchange Rate Movements

- **November 2024:** ₹84.4/USD; REER 108.03 (overvalued)
- **May 20, 2026:** ₹96.96/USD – all-time low
- **May 2026:** Average ₹95.5/USD; REER 89.08 (undervalued)
- **July 2026:** ~₹95.9/USD; REER 91.26 (still undervalued)
- **Oil Price Context:** Brent crude crossed $126.4 (Apr 30); surged past $95 (Jul 23); eased below $85

Comparison with Chinese Yuan

- **RBEER (Federal Reserve St. Louis):** Compares currency to 64 trade partners; 2020 base = 100
- **November 2024:** Yuan RBEER 92.16 (undervalued); Rupee RBEER 106.1 (overvalued)
- **June 2026:** Yuan RBEER 92.24; **Rupee RBEER 90.15**
- **Implication:** Rupee is now **more undervalued and competitive than the yuan**

RBI Governor's View

- **Undervaluation Confirmed:** "One could argue that the rupee has become undervalued"
- **Potential Appreciation:** Once West Asia stabilises, rupee could appreciate as seen in past episodes
- **Cautious Outlook:** Depends on geopolitical stability, shipping lanes, and US trade actions

Implications for India's Economy

Potential Benefits

- **Export Boost:** Cheaper rupee makes Indian goods more competitive globally
- **Manufacturing Competitiveness:** Domestic industry better positioned against imports
- **Tourism & Remittances:** Inbound tourism and NRI remittances become more attractive
- **Current Account:** Potential improvement in trade deficit (if export volume increases)

Risks and Challenges

- **Import Costs:** Costlier imports (especially oil, electronics, machinery)
- **Inflation:** Pass-through of higher import prices to domestic consumers
- **Foreign Debt:** Higher repayment burden for dollar-denominated debt
- **Capital Flows:** May deter foreign portfolio investment if depreciation continues
- **Uncertainty:** Actual boost to exports depends on global demand and supply chains

Comparative Advantage

- **Vs. Yuan:** Rupee more undervalued – could help Indian exports compete with China in third markets
- **Global Context:** Many emerging market currencies have weakened; India's positioning matters
- **Oil Dependency:** India's high oil imports (over 88%) offset some benefits of depreciation

Challenges

- **Geopolitical Uncertainty:** West Asia tensions; US trade actions
- **Inflation Risk:** Imported inflation from oil and commodities
- **Global Demand:** Export growth depends on demand in partner countries
- **Supply Chains:** Competitiveness requires quality, logistics, and infrastructure

Policy Recommendations

- **Monitor REER Regularly:** Use as guide for exchange rate management
- **Support Exporters:** Address non-price barriers (quality, standards, logistics)
- **Manage Inflation:** Use monetary and fiscal tools to mitigate imported inflation
- **Diversify Energy Sources:** Reduce oil import dependence over time
- **Build Resilience:** Strengthen forex reserves; manage external debt

Conclusion

The rupee's shift from overvalued to undervalued has improved India's export competitiveness. However, its benefits depend on global demand, supply chains, and geopolitical stability, while also posing risks of imported inflation and higher import costs. Sustained gains require supportive policies and a balanced approach to exchange-rate management.

Antimicrobial Resistance: The Case for Restraint in Antibiotic Use

Introduction

Antibiotics are vital in India, but their **misuse and overuse are driving antimicrobial resistance (AMR)**, threatening public health and medical progress. Tackling this silent pandemic requires **evidence-based prescriptions, antibiotic stewardship, stronger surveillance, and public awareness**, with coordinated action by healthcare providers, policymakers, and citizens.

The AMR Crisis: Magnitude and Drivers

Global and National Burden

- **Global Threat:** AMR could cause 10 million annual deaths by 2050 (UN estimate); economic losses comparable to 2008 financial crisis.
- **India's Burden:** Highest AMR rates among Gram-negative bacteria globally; ~60,000 newborns die annually from antibiotic-resistant infections.
- **Economic Impact:** Significant healthcare costs, prolonged hospital stays, and lost productivity.

Drivers of AMR in India

- **Over-the-Counter Sales:** Widespread availability of antibiotics without prescription.
- **Incomplete Courses:** Patients stopping treatment prematurely.
- **Irrational Use:** Broad-spectrum antibiotics for viral infections (e.g., common cold).
- **Animal Agriculture:** Heavy use of antibiotics in livestock and poultry.
- **Environmental Contamination:** Discharge from pharmaceutical manufacturing and hospitals.

Consequences

- **Treatment Failure:** Infections becoming untreatable with first-line drugs.
- **Surgical Risk:** Routine procedures (caesareans, joint replacements) becoming high-risk.
- **Vulnerable Populations:** Immunocompromised, elderly, and children most affected.
- **Pandemic Vulnerability:** AMR compounds threats from infectious disease outbreaks.

Current Policy and Regulatory Framework

National Action Plan on AMR (NAP-AMR)

- **Launched:** 2017; aligns with WHO Global Action Plan.
- **Objectives:** Awareness, surveillance, infection prevention, optimized use, and R&D.
- **Progress:** Limited implementation; need for stronger enforcement and monitoring.

Regulatory Measures

- **Schedule H and H1:** Restrict antibiotics; require prescription.
- **Red Line Campaign:** Awareness on red-striped antibiotics (to prevent misuse).
- **Pharmacy Regulations:** Enforcement weak; OTC sales persist.

Infection Prevention and Control (IPC)

- **Healthcare Settings:** Need for robust IPC practices (hand hygiene, sterilization).
- **Vaccination:** Reduces need for antibiotics (e.g., pneumococcal, influenza vaccines).
- **Water and Sanitation:** WASH interventions reduce bacterial infections.

AMR Surveillance

- **ICMR-AMR Network:** Tracks resistance patterns across India.
- **Integrated Surveillance:** Human, animal, and environmental data needed.

Challenges

- **Enforcement:** Weak regulation of antibiotic sales; minimal penalties.
- **Awareness:** Low public understanding of AMR; expectation of antibiotics for viral illnesses.
- **Healthcare Practice:** Pressure to prescribe; diagnostic uncertainty.
- **Animal Sector:** Inadequate regulation of antibiotic use in food animals.
- **Environmental:** Pharmaceutical effluent not effectively controlled.

Way Forward: Evidence-Based Restraint

Stewardship in Healthcare

- **Antibiotic Stewardship Programs (ASPs):** Protocols for appropriate use in hospitals.
- **Diagnostic Stewardship:** Rapid diagnostics to distinguish bacterial from viral infections.
- **Clinical Guidelines:** Evidence-based protocols for common infections.
- **Training:** Medical education on rational prescribing.

Strengthening Regulation

- **Enforce Prescription:** Strict penalties for OTC sales; regular inspections.
- **Track and Trace:** Digital monitoring of antibiotic sales and use.
- **Animal Antibiotics:** Ban growth promoters; regulate veterinary use.
- **Environmental Standards:** Effluent limits for pharmaceutical manufacturing.

Public Awareness

- **Behaviour Change:** Campaigns on completing courses, not demanding antibiotics.
- **School Education:** AMR awareness in curriculum.
- **Community Engagement:** Use local languages and community health workers.

Surveillance and Research

- **One Health Approach:** Integrate human, animal, and environmental surveillance.
- **AMR Data:** Public dashboards; inform policy and practice.
- **R&D:** Incentivize new antibiotics, diagnostics, and vaccines.

Global Cooperation

- **Global AMR Fund:** Support low- and middle-income countries.
- **International Standards:** Harmonize regulations on antibiotic use.
- **Knowledge Sharing:** Learn from countries with successful stewardship (e.g., UK, Sweden).

Conclusion

Antibiotics are priceless tools, but their overuse threatens to make them obsolete. India's high infectious disease burden makes antibiotics indispensable, yet the current trajectory of AMR is unsustainable. Addressing the AMR crisis requires replacing quick-fix prescriptions with evidence-based care, supported by robust stewardship, regulation, awareness, and surveillance. The time for restraint is now—to preserve antibiotics for future generations and protect the gains of modern medicine.

Saving Soil, Securing Farms: India's Soil Health Strategy

Introduction

Soil is a strategic national resource, vital for agricultural productivity, food security, and rural livelihoods. The **Soil Health Card Scheme** has issued over **25.89 crore cards**, while the **National Mission on Natural Farming** covers **8.80 lakh hectares**. Digital tools, AI, geospatial mapping, and carbon farming are strengthening soil management and climate resilience, advancing **SDG 2 and SDG 13**.

Soil Diversity and National Significance

India's Soil Types and Distribution

- **Alluvial Soils:** Indo-Gangetic plains, deltas (Punjab, UP, Bihar, West Bengal) – fertile, widely distributed
- **Black Soils:** Maharashtra, MP, Gujarat – clayey, moisture-retentive, rich in lime/calcium
- **Red Soils:** Tamil Nadu, Karnataka, Andhra Pradesh, Rajasthan – porous, low in nutrients
- **Laterite Soils:** Kerala, Karnataka, Odisha, Assam – high rainfall, intense leaching
- **Desert Soils:** Rajasthan, Gujarat, Ladakh – sandy, low moisture
- **Saline/Alkaline Soils:** Arid/semi-arid regions, coastal areas – salt accumulation affects productivity
- **Forest/Hill Soils:** Himalayan and North-Eastern regions – vary with altitude

Soil's Role in Climate Action

- **Carbon Sink:** Soils absorb and store atmospheric CO_2 as soil organic carbon (SOC)
- **Benefits of Higher SOC:** Improves soil structure, moisture retention, nutrient availability, and climate resilience
- **Carbon Farming:** Practices that remove atmospheric carbon and store it in soils through sustainable land management
- **National Progress:** Additional carbon sink of 2.29 billion tonnes CO_2 equivalent created between 2005 and 2021 (India State of Forest Report 2023)

Key Government Initiatives

- **Soil Health Card Scheme:** 25.89 crore cards issued; promotes balanced fertiliser use through demonstrations and advisories.

- **National Mission on Natural Farming (NMNF):** 18,786 clusters covering 8.80 lakh hectares and 18.19 lakh farmers.
- **Fertiliser Reforms:** Nutrient Based Subsidy, 100% neem-coated urea, and DBT for transparent subsidy delivery.
- **Sustainable Agriculture:** NMSA promotes integrated farming, while the **Green India Mission** targets a 2.5–3 billion tonne CO_2-equivalent carbon sink by 2030.
- **Khet Bachao Abhiyan (2026):** Promotes soil-test-based nutrient management and reduced chemical fertiliser dependence.
- **Carbon Credit Trading:** Enables farmers to earn additional income through verified emission-reduction practices.

Digital and Technological Advancements

- **Geospatial Mapping:** SLUSI has mapped **29 million hectares** to support scientific soil management.
- **Digital Agriculture & AgriStack:** Over **7.63 crore Farmer IDs** and **23.5 crore crop plots** surveyed, enabling location-specific advisories.
- **AI & Precision Farming:** KDSS integrates soil, weather, and crop data, while AI, satellites, and remote sensing enable targeted nutrient and water management.
- **Agri-Robotics:** ICAR-IARI is developing robots for automated soil sampling and crop monitoring.

Challenges

- **Awareness Gap:** Many farmers still unaware of Soil Health Card recommendations
- **Digital Divide:** Access to AI/digital platforms limited in remote areas
- **Implementation:** Varied adoption across states; quality of soil testing
- **Fertiliser Subsidy:** High subsidy outlay (₹6.77 lakh crore) may encourage overuse
- **Carbon Markets:** Complex verification processes; limited farmer participation
- **Soil Degradation:** Salinity, alkalinity, erosion persist in many regions

Way Forward

- **Strengthen Infrastructure:** Expand soil-testing labs, mobile testing facilities, and quality assurance.
- **Leverage Technology:** Use AI-based advisories, multilingual apps, and integrate soil data with AgriStack and DigiLocker.
- **Promote Balanced Nutrition:** Encourage soil-test-based fertilisers, bio-fertilisers, and greater awareness.
- **Scale Natural & Carbon Farming:** Expand NMNF, simplify carbon-credit access, and provide financial support.
- **Improve Governance:** Link soil health with farmer welfare schemes, empower states, and ensure independent monitoring.

Conclusion

India has made significant progress in soil health through **25.89 crore Soil Health Cards, NMNF clusters, and AI-enabled agriculture**. However, awareness gaps, digital divides, and implementation challenges persist. Strengthening soil infrastructure, scaling natural farming, promoting balanced nutrient use, and leveraging technology are essential for **sustainable agriculture, resilient livelihoods, and climate action**.

MANAS: A Digital Shield Against Drugs

Introduction

MANAS (Madak Padarth Nishedh Asoochna Kendra), launched on **18 July 2024** by the Narcotics Control Bureau in collaboration with the Digital India Corporation, is a technology-driven national narcotics helpline. It enables citizens to confidentially report drug-related activities, access counselling and rehabilitation support,

and connect through helpline **1933**, the web portal, email, and the UMANG app. By integrating reporting, support, and awareness, MANAS strengthens citizen participation in drug control under the Digital India initiative.

Understanding MANAS: Need and Architecture

The Substance Abuse Challenge in India

- **Alcohol Users:** 16 crore; over 5.7 crore severely affected
- **Cannabis Users:** 3.1 crore
- **Opioid Users:** 2.26 crore; 2.8 crore dependent on opioids
- **Sedatives Users:** 1.18 crore
- **Urgent Treatment Need:** ~28 lakh for opioid dependence alone
- **Impact:** Affects individuals, families, communities, public safety, and national security

Platform Design and Features

- **Multi-Channel Access:** 1933 helpline, web portal, email, UMANG app
- **Confidential Reporting:** Citizens can report drug trafficking, peddling, illegal cultivation without revealing identity
- **Counselling Support:** Calls transferred to Ministry of Social Justice and Empowerment helpline 14446
- **24/7 Availability:** Accessible anytime, anywhere in India
- **Multilingual Support:** Smart IVRS, chatbot integration, regional language assistance
- **Digital Workflow:** Ticket generation, tracking, and resolution for faster coordination

Institutional Framework

- **Aegis:** Narcotics Control Bureau (NCB), Ministry of Home Affairs
- **Technical Partner:** Digital India Corporation (DIC)
- **Linkages:** 30 NCB Zonal Units; 36 State/UT Anti-Narcotics Task Forces (ANTFs)
- **Vision:** Combines Digital India and Nasha Mukt Bharat mission

Impact and Achievements

Public Trust and Citizen Participation

- **Active Engagement:** Citizens empowered to report activities, no longer silent bystanders
- **Confidentiality:** Encourages reporting without fear of reprisal
- **Awareness Drives:** Quizzes, poster contests, reel-making on MyGov portal to engage youth
- **Growing Usage:** Increasing calls for reporting and counselling indicate rising public trust

Strengthening Enforcement and Coordination

- **Information Sharing:** Digital tickets enable faster sharing with law-enforcement agencies
- **Actionable Intelligence:** Public alerts converted into on-record intelligence
- **Inter-Agency Coordination:** Improved response mechanisms across NCB and ANTFs
- **Transparency:** Digitized workflows bring speed, accountability, and tracking

Counselling and Rehabilitation Access

- **Professional Support:** Increased willingness to seek help for substance abuse
- **Linkage:** Direct connection to Ministry of Social Justice and Empowerment helpline 14446
- **De-addiction Support:** Encourages treatment at nearest government de-addiction centres
- **Human Approach:** Treats addicts as victims requiring respect, counselling, and therapy

Data-Driven Insights

- **Pattern Analysis:** Digitally captured data helps identify trends and hotspots
- **Policy Planning:** Enables evidence-based response strategies
- **Resource Allocation:** Helps agencies deploy resources where problems are rising

- **Continuous Improvement:** Data informs platform enhancements and outreach strategies

Challenges

- **Awareness Gap:** Many citizens may not know about MANAS or how to use it
- **Trust Deficit:** Fear of retaliation may still discourage reporting
- **Infrastructure:** Reliable internet/phone access in remote areas
- **Capacity:** Need for adequate trained counsellors and law-enforcement personnel
- **Stigma:** Social stigma around addiction may reduce help-seeking behaviour

Way Forward

Strengthening Awareness and Outreach

- Launch targeted campaigns in schools, colleges, and rural areas
- Use social media influencers and community leaders to promote MANAS
- Integrate with PM Vishwakarma, MY Bharat platforms for wider youth outreach
- Leverage Common Service Centres (CSCs) for awareness in remote villages

Enhancing Platform Capabilities

- Expand multilingual support to all major regional languages
- Introduce AI-based chatbot for instant responses and triage
- Develop offline reporting mechanism for low-connectivity areas
- Enhance mobile app with push notifications and location-based alerts

Strengthening Enforcement Linkages

- Automate intelligence sharing with all 30 NCB units and 36 ANTFs
- Provide real-time dashboards for law-enforcement agencies
- Establish feedback mechanisms to report action taken on citizen tips
- Integrate with other drug enforcement databases (e.g., customs, border forces)

Improving Counselling and Rehabilitation

- Expand network of trained counsellors; ensure 24/7 availability
- Integrate with tele-MANAS for mental health support
- Strengthen de-addiction centres in every district
- Provide aftercare and community-based reintegration programmes

Research and Policy Support

- Use data analytics for trend forecasting and policy making
- Conduct periodic impact assessments
- Study socio-economic patterns of addiction for targeted intervention
- Share learnings with other countries through global partnerships

Conclusion

MANAS is a major step in India's fight against drug abuse, leveraging technology, citizen participation, and institutional coordination. By enabling confidential reporting, counselling, and direct linkage with NCB units and State Anti-Narcotics Task Forces, it strengthens enforcement and public engagement. Addressing challenges of awareness, trust, and capacity while expanding outreach and integration with health systems will be crucial for achieving a **Nasha Mukt Bharat**.

Ethanol Blending in India: Policy Evolution and Energy Security

Introduction

The **Ethanol Blended Petrol (EBP) Programme** has become a cornerstone of India's energy transition, achieving **20% ethanol blending in 2025–26**, five years ahead of target. It has reduced crude oil imports, saved

over **₹1.9 lakh crore** in foreign exchange, lowered emissions, and significantly increased farmers' incomes, advancing energy security, environmental sustainability, and rural development.

Policy Evolution and Key Milestones

Blending Trajectory

- **2013-14:** <1.5% blending
- **2025-26:** 20% blending (achieved 5 years ahead of schedule)
- **Ethanol Procurement:** 38 crore litres (ESY 2013-14) → 1,200+ crore litres (projected 2025-26)
- **Production Capacity:** 421 crore litres (2014) → 2,000 crore litres (2026) – nearly 5-fold increase

Programme Impact

- **Foreign Exchange Saved:** ₹1.90+ lakh crore (since ESY 2014-15)
- **Crude Oil Substituted:** 310+ lakh MT
- **CO2 Emissions Cut:** 930+ lakh MT
- **Additional Farmer Earnings:** ₹1.60+ lakh crore

Addressing Key Concerns: Evidence vs. Myths

Engine Performance and Durability

- **Mileage:** 30% figure refers to ethanol's lower calorific value, not real-world mileage. Actual drop: ~0.6 km/litre (for 20 km/litre vehicle); driving habits and maintenance matter more.
- **Engine Damage:** No widespread pattern of engine failure linked to E20. Cleared after extensive testing by SIAM, ARAI, IOCL, and vehicle makers. Maruti Suzuki serviced 2.84 crore vehicles in FY26; over 1.5 crore older (non-E20 certified) vehicles showed no E20-related damage.
- **Performance:** Ethanol is high-octane (RON ~108.5 vs. 84.4 for petrol); E20 raises effective octane to ~95, improving acceleration and reducing emissions.

Insurance and Warranty

- **Clarification:** Insurers and OEMs confirm E20 has no impact on insurance or warranty validity. SIAM categorically confirmed warranties honoured for vehicles running spec-compliant E20.

Pricing and Water Use

- **Pricing:** 2020-21 NITI Aayog report cited ethanol cheaper than petrol; procurement costs have since risen above refined petrol costs. Mandate continues for energy security, environmental, and farm income gains.
- **Water Use:** Ethanol plant uses 3-5 litres of processed water per litre of ethanol; modern distilleries run Zero Liquid Discharge. Attributing entire agricultural water footprint to ethanol is incorrect. Only surplus rice (permitted by DFPD after meeting food security) is diverted for ethanol.

Misleading Claims

- **Sugarcane Juice in Petrol:** Viral videos misleading. Ethanol produced through fermentation and industrial processing, meeting strict fuel quality specifications.
- **Ants/Bees Swarming:** Fuel ethanol is distilled – residual sugars eliminated; contains denaturants; petrol's odour dominates.
- **Water Absorption:** Keeping water out of fuel tanks is basic design; modern vehicles have safeguards.

Industry and Global Confidence

Industry Voices

- **Toyota:** E20 proven, high-performance fuel; rigorous independent certification.
- **Maruti Suzuki:** Serviced 2.84 crore vehicles; no E20-related damage; mileage drop negligible; better acceleration, lower pollution.
- **Hero MotoCorp:** Analysis of extensive service data found no higher damage in vehicles running on E20.

- **Engineers India Limited:** Programme developed through extensive consultation, supported by scientific evidence, global best practices, BIS standards, and BS-VI norms.

Global Best Practices

- **United States:** E10 standard; E15 expanding; millions of flex-fuel vehicles (up to E85)
- **Brazil:** Global leader; mandates E27, raising to ~35%; 80%+ new cars flex-fuel
- **Japan:** Phased E10 rollout
- **Others:** Canada, Thailand, several European nations have adopted ethanol blending

Challenges

- **Feedstock Availability:** Balancing food vs. fuel; ensuring surplus grain diversion only
- **Water Use:** Sustainable water management for feedstock cultivation
- **Infrastructure:** Storage, distribution, and retail network for E20
- **Vehicle Compatibility:** Older vehicles not E20-certified; phased transition needed
- **Price Volatility:** Ethanol procurement costs have risen above petrol; subsidy implications

Way Forward

Strengthening Feedstock Security

- Expand maize and surplus rice-based ethanol production
- Promote second-generation (2G) ethanol from agricultural waste
- Ensure food security through surplus-only diversion policies

Infrastructure and Compliance

- Expand storage and blending infrastructure nationwide
- Ensure uniform E20 availability at all retail outlets
- Strengthen quality testing and BIS compliance

Vehicle Transition

- Continue awareness campaigns for consumers
- Support OEMs in E20-certified vehicle production
- Phased transition for older vehicle fleet

Sustainability

- Promote water-efficient feedstock cultivation
- Strengthen Zero Liquid Discharge in distilleries
- Integrate with circular economy and waste-to-energy initiatives

Conclusion

India's **Ethanol Blended Petrol (EBP) Programme** has become a key pillar of energy security, achieving **20% blending** five years ahead of target. It has reduced import dependence, lowered emissions, and boosted farmers' incomes. Going forward, its success will depend on sustainable feedstock, stronger infrastructure, and greater consumer awareness.

Rising Inflation Complicates RBI's Monetary Policy Choice

Introduction

India's retail inflation rose to **4.38% in June 2026** (from **3.93% in May**), driven by higher food, transport, and restaurant prices. Ahead of the **RBI MPC meeting (August 3–5, 2026)**, policymakers face a dilemma as weak monsoon conditions, lower kharif sowing, and rising global oil prices due to West Asia tensions could intensify inflationary pressures while balancing growth concerns.

Domestic Inflation Dynamics: The Food Challenge

Current CPI Trends

- **Headline Inflation:** 4.38% in June (3.93% in May); Q1 average ~3.9%

- **Food Inflation (CFPI):** 5.32% (4.78% in May); key items: ginger, tomato, raisin
- **Rural-Urban Divide:** Rural inflation (4.74%) higher than urban (3.92%)
- **Housing:** 2.10% (moderate)

Monsoon and Kharif Risks

- **Rainfall Deficit:** 19.3% below normal (June 1 onwards)
- **June 2026:** Third driest June in 100 years (99.5 mm vs. normal ~166 mm)
- **Sowing:** Overall acreage down 16% from last year; sowing window closing
- **El Niño:** Strengthening, adding uncertainty to food prices
- **IMD Forecast:** Below-normal monsoon (90-95% of LPA) with 84% probability

Transmission Risks

- **Food-to-Core Spillover:** Analysts expect higher input/fuel prices to gradually push up non-food items
- **Transport Inflation:** Reflected full impact of mid-May petrol/diesel price hikes
- **Restaurant Inflation:** Food and energy price pass-through

External Risks: Oil and Global Spillovers

West Asia Geopolitical Shocks

- **Brent Crude:** Edged up 7.5% in five days; hit one-month high of ~$85
- **US-Iran Tensions:** Renewed hostilities; reinstated naval blockade; Strait of Hormuz disruptions
- **Supply Risk:** ~20% of global crude passes through Hormuz; disruptions could push oil to $110-150
- **Market Structure:** Brent backwardation indicates tight supply expectations

Global Monetary Policy Divergence

- **ECB:** Raised rates in June; next decision this week
- **US Fed:** Holding steady; one to two rate cuts possible later in 2026
- **Australia:** Raised rates in February 2026
- **Emerging Markets:** Divided—importers like Indonesia hiking; exporters like Brazil cutting
- **OECD Projection:** India may raise rates temporarily in Q2 2026

MPC's Dilemma: Balancing Internal and External Risks

Inflation Target and Tolerance

- **Target:** 4% CPI inflation; tolerance band: ±2%
- **Current:** 4.38% (June); 3.9% (Q1 average)
- **Projections:** May not align with 4.2% projection due to emerging risks

Risks to Balance

- **Food Inflation Upside:** Monsoon deficit, El Niño, kharif sowing decline
- **Oil Price Upside:** Geopolitical escalation; 7.5% rise in 5 days
- **Growth Concerns:** Rural consumption, investment climate
- **Global Spillovers:** Divergent central bank actions; capital flows

Historical Context

- **Repo Rate:** Currently 6.25% (reduced from 6.50% in February 2025)
- **Stance:** MPC maintained status quo on rates and stance in June
- **Flexibility:** Neutral stance allows response to evolving risks

Challenges

- **Data Gap:** Food inflation forecasting complex due to monsoon variability
- **Geopolitical Uncertainty:** Oil price volatility beyond domestic control
- **Global Divergence:** Mixed signals from major central banks
- **Fiscal Trade-offs:** Rising energy costs may require budget support

Way Forward

- **August MPC:** Decision hinges on July food and oil data
- **Rate Action:** Temporary hike possible if food/oil pressures persist
- **Communication:** Clear guidance on balancing inflation-growth risks
- **Structural:** Strengthen food supply chains and strategic oil reserves

Conclusion

The August MPC meeting faces a policy dilemma as rising food inflation, a weak monsoon, and higher global oil prices increase inflationary risks. While inflation remains broadly within target, the RBI must balance price stability with growth, making a calibrated and flexible policy response crucial amid persistent domestic and global uncertainties.

Tourism: Unlocking India's Journey to a New Milestone

Introduction

India's tourism and hospitality sector contributes about **7% to GDP** and supports **over 9% of total employment**. With rising domestic demand, expanding infrastructure, and growing tourism in Tier-II/III cities, the sector has strong growth potential. Realizing this opportunity will require sustained policy support, investment, and integrated planning.

India's Tourism Growth: Current Landscape

Economic and Employment Impact

- **GDP Share:** ~7% of India's GDP
- **Employment:** Over 9% of total jobs; every direct job creates multiple indirect jobs
- **Foreign Exchange:** Significant contributor to forex earnings
- **Soft Power:** Showcases India's heritage, diversity, and identity globally

Post-Pandemic Recovery and Demand

- **Occupancy Levels:** Consistently strong across major markets
- **Average Room Rates:** Surpassed pre-pandemic levels
- **Investor Confidence:** Rising participation from institutional funds, family offices, listed hotel companies
- **Distributed Demand:** Growth increasingly driven by Tier-II and Tier-III cities, creating a diversified ecosystem

Infrastructure as a Catalyst

- **Regional Airports:** Expanding connectivity to new destinations
- **Road Networks:** Improving accessibility
- **Economic Corridors:** Reshaping tourism flows
- **Airport-Centric Development:** Driving hotel growth through business travel, transit stays, MICE tourism

Key Challenges and Policy Gaps

Infrastructure and Investment

- **Destination Readiness:** Infrastructure investments not always complemented by accommodation and visitor experiences
- **Last-Mile Connectivity:** Gaps in rural and emerging destinations
- **Wayside Amenities:** Inadequate along tourist routes
- **Digital Infrastructure:** Need for integrated booking and information systems

Regulatory and Taxation Issues

- **Industry Status:** Tourism not granted industry status in all states, limiting access to capital and cheaper financing
- **Taxation:** Not aligned with global benchmarks
- **Single-Window Clearance:** Absence of streamlined approvals for hospitality projects
- **Visa Regime:** Despite e-visa expansion, further liberalisation needed

Marketing and Promotion

- **Brand Bharat:** Need for a dedicated global tourism promotion campaign with sustained funding
- **Destination Development:** 50 tourism destinations to be developed on mission mode with clear timelines

FAITH's Action Agenda: Priorities for Growth

Policy and Regulatory Reforms

- **Industry Status:** Grant tourism industry status across all states to improve access to capital and reduce financing costs
- **Tax Rationalisation:** Align taxation with global benchmarks
- **Single-Window Clearance:** Simplify approvals for hospitality projects
- **Visa Liberalisation:** Expand e-visa access and simplify entry procedures

Infrastructure Development

- **Mission-Mode Destinations:** Fast-track development of 50 tourism destinations with clear implementation timelines
- **Last-Mile Connectivity:** Improve access to emerging destinations
- **Wayside Amenities:** Develop along highways and tourist routes
- **Digital Infrastructure:** Enhance booking and information systems

Investment and Financing

- **Institutional Investment:** Increase from current levels to match mature hospitality markets
- **PPP Models:** Encourage public-private partnerships for destination development
- **Skill Development:** Strengthen workforce training for hospitality and tourism

Global Marketing and Branding

- **Brand Bharat:** Launch a dedicated global tourism promotion campaign
- **Sustained Funding:** Ensure consistent budgetary support for promotion
- **Digital Marketing:** Leverage social media and digital platforms for global outreach

Way Forward

Policy and Institutional Reforms

- Grant **industry status** to tourism in all states
- Establish **National Tourism Development Authority** for coordination
- Rationalise **GST and other taxes** to global benchmarks
- Implement **single-window clearance** for hospitality projects

Infrastructure and Destination Development

- Develop **50 tourism destinations on mission mode** with clear timelines
- Integrate tourism into **infrastructure planning** (airports, highways, corridors)
- Invest in **last-mile connectivity** and wayside amenities
- Promote **sustainable and responsible tourism** practices

Investment and Skilling

- Attract **institutional investment** through PPP models
- Enhance **skill development** for hospitality workforce

- Support **MSMEs and local enterprises** in tourism value chain
- Leverage **Digital India** for tourism promotion and services

Global Marketing and Branding

- Launch **Brand Bharat** campaign with sustained funding
- Expand **e-visa and visa-on-arrival** facilities
- Participate in **international travel marts and roadshows**
- Use **digital platforms** for targeted global promotion

Conclusion

India's tourism sector, contributing **~7% to GDP** and **over 9% of employment**, is poised for strong growth. To unlock its full potential, India must strengthen policy support, boost investment, develop world-class destinations, and improve tourism infrastructure. A robust tourism ecosystem can drive inclusive growth, employment, and India's global appeal.

Guardians of India's Maritime Frontiers: Indigenous Naval Classes

Introduction

India's maritime strength relies on three indigenous warship classes—**Nilgiri** (stealth frigates), **Sandhayak** (survey vessels), and **Arnala** (anti-submarine warfare craft)—which provide layered naval defence. Recent additions, including **INS Dunagiri, INS Sanshodhak, INS Agray,** and **INS Mahendragiri**, strengthen this capability. With **75–80% indigenous content**, these ships advance **Aatmanirbhar Bharat**, secure India's **11,098 km coastline**, **2.4 million sq km EEZ**, and vital sea lanes, while supporting the **Blue Economy** and defence exports.

The Three Pillars of India's Naval Capability

Nilgiri-Class Stealth Frigates (Project 17A)

- **Role:** Surface combat, sea control, power projection
- **Design:** Navy's Warship Design Bureau; built at MDL (4 ships) and GRSE (3 ships)
- **Latest:** INS Dunagiri (5th) and INS Mahendragiri (6th) commissioned (June-July 2026)
- **Key Specs:** 149m length, 6,670 tonnes displacement, 28 knots speed, CODOG propulsion
- **Weapons:** BrahMos missiles, medium-range air-defence missiles, close-in guns
- **Stealth:** Angled surfaces, radar-absorbing coatings, reduced thermal/acoustic signatures
- **Indigenous Content:** 75%
- **Economic Impact:** Engaged 200+ MSMEs, 4,000 direct jobs, 10,000+ indirect jobs

Sandhayak-Class Survey Vessels (Large)

- **Role:** Hydrographic surveys, seabed mapping, nautical charts, Blue Economy support
- **Design:** Navy's Warship Design Bureau; built at GRSE (4 ships)
- **Latest:** INS Sanshodhak (4th and final) commissioned on World Hydrography Day (21 June 2026)
- **Key Specs:** 110m length, 3,400 tonnes, 18+ knots speed, 6,500 nautical miles range
- **Equipment:** Multi-beam echo sounders, side-scan sonar, autonomous underwater vehicles
- **Secondary Role:** Hospital ship, humanitarian assistance, disaster relief
- **Achievement:** Surveyed 89,000 sq km, produced 96 charts (2019-24)
- **Indigenous Content:** Over 80%

Arnala-Class Anti-Submarine Warfare Shallow Water Craft

- **Role:** Coastal defence, submarine detection in shallow waters
- **Design:** Indian shipyards; built at GRSE in partnership with L&T (8 ships)
- **Latest:** INS Agray (4th) commissioned (June 2026)
- **Key Specs:** 77.6m length, 900 tonnes, 25 knots speed, waterjet propulsion

- **Weapons:** Lightweight torpedoes, anti-submarine rockets
- **Sensors:** Shallow-water sonar, combat management system
- **Significance:** Largest waterjet-propelled warship in Indian Navy; replaces ageing Abhay-class
- **Future:** Mahe-class (16 craft planned) under construction at Cochin Shipyard

Strategic and Economic Impact

Aatmanirbhar Bharat in Defence

- **Indigenisation:** 75-80% indigenous content; 64 of 66 ships/submarines on order built in India
- **Design:** All three classes designed by Navy's Warship Design Bureau
- **Shift:** From "Buyer's Navy" to "Builder's Navy"

Employment and MSME Ecosystem

- **Project 17A:** 200+ MSMEs engaged; 4,000 direct + 10,000 indirect jobs
- **Arnala Class:** Partnership between GRSE and L&T Kattupalli
- **Vendor Base:** Expanding indigenous defence manufacturing ecosystem

Defence Exports

- **Record:** ₹23,622 crore in 2024-25 (12% growth over previous year)
- **Overseas Orders:** GRSE executing export orders for naval platforms
- **Shift:** India moving from importer to exporter of warships

Maritime Security and Diplomacy

- **Layered Defence:** Frigates (sea control) + Survey ships (safe passage) + ASW craft (littorals)
- **SAGAR (2015):** Security and Growth for All in the Region
- **MAHASAGAR (2025):** Mutual and Holistic Advancement for Security and Growth Across Regions
- **Role:** First responder in Gulf of Aden, piracy countering, freedom of navigation

Blue Economy Support

- **Contribution:** ~4% of India's GDP
- **Survey Charts:** Open ports, channels, Exclusive Economic Zone
- **Support:** Fishing, offshore energy, safe shipping

Challenges

- **Technology Gaps:** Some critical systems still imported (engines, sensors)
- **Pace of Production:** Need to accelerate to meet growing threats
- **Global Competition:** Other navies also modernising rapidly
- **Budget Constraints:** Balancing between procurement and operational costs
- **R&D Investment:** Need for continuous innovation in naval design

Way Forward

Strengthening Indigenisation

- Target 100% indigenous content for future classes
- Develop indigenous propulsion, sensors, and weapons systems
- Expand MSME and private sector participation

Modernisation and Technology

- Invest in AI, unmanned systems, and cyber capabilities
- Develop next-generation stealth and ASW technologies
- Enhance interoperability with allied navies

Export and Global Partnerships

- Aggressively market Indian-built warships globally

- Build partnerships with Indian Ocean Region countries
- Provide training and maintenance support for exported platforms

Blue Economy and Hydrography

- Expand hydrographic surveys in Indian Ocean Region
- Support friendly nations with nautical charts
- Strengthen role as trusted hydrographic partner

Conclusion

The **Nilgiri, Sandhayak, and Arnala** classes reflect India's growing maritime self-reliance under **Aatmanirbhar Bharat**. With **75–80% indigenous content**, they strengthen sea control, safe navigation, and coastal defence while boosting employment, MSMEs, defence exports, and the Blue Economy. Together, they reinforce India's maritime security and its role as a leading power in the Indian Ocean Region.

PAPER 4

CASE STUDY

Q. The State Government has approved the acquisition of agricultural land for establishing a large industrial and infrastructure project. The project is expected to generate substantial investment, create employment opportunities, and contribute to regional economic development. However, a significant number of farmers whose lands are proposed to be acquired have opposed the project. They argue that the compensation offered is inadequate, rehabilitation measures are uncertain, and the acquisition would permanently deprive them of their primary source of livelihood.

The protests have intensified over the past few days, with farmers organizing peaceful demonstrations and blocking access to the project site. While the majority of protesters remain peaceful, intelligence inputs suggest that a few vested interests may exploit the situation to incite violence. The State Government has directed the district administration to ensure that the project proceeds without delay, citing its strategic importance. At the same time, the media and civil society organisations are closely monitoring the government's response.

You are the District Collector responsible for implementing the land acquisition process.

a) Identify the ethical issues involved in the above case?
b) What are the options available to you? Evaluate the merits and demerits of each option.
c) As the District Collector, what course of action would you adopt to balance developmental objectives with the rights and welfare of the affected farmers? **(250 words, 20 marks)**

Q. You are a senior finance manager in a reputed multinational company. While reviewing financial records, you discover that certain senior executives have deliberately manipulated financial statements over the past two years to inflate profits and improve the company's market valuation. The irregularities have enabled the company to attract substantial investments and earn performance-linked incentives for the top management.

You confidentially bring the matter to the notice of your immediate superior. However, you are advised to remain silent as exposing the issue could severely damage the company's reputation, lead to job losses for thousands of employees, and affect investor confidence. You are also informally warned that pursuing the

matter may adversely affect your career progression and could even result in termination of your employment.

You firmly believe that concealing the fraud would be unethical and illegal. At the same time, you are conscious of your responsibilities towards your family, your colleagues, and the broader interests of the company.

a) What are the ethical issues involved in the above case?
b) What are the options available to you? Evaluate the merits and demerits of each option.
c) What course of action would you adopt? Justify your decision with reference to the ethical values expected of a corporate professional. **(250 words, 20 marks)**

Q. Artificial Intelligence (AI) is rapidly transforming the way governments, businesses and public institution function. AI-powered systems are increasingly being used in areas such as recruitment, healthcare, policing welfare delivery, judicial administration and financial services. Their ability to process vast amounts of dat promises greater efficiency, consistency and objectivity in decision-making. At the same time, concerns hav emerged regarding algorithmic bias, opacity of automated decisions, misuse of personal data, exclusion o vulnerable groups, and the dilution of human accountability. In many situations, AI systems may produc outcomes that are legally valid and technically efficient yet appear ethically questionable. As governments mov towards greater reliance on AI-driven decision-making, there is an increasing need to ensure that technologica progress remains consistent with constitutional values, human dignity and public trust.

Answer the following questions:

a) What are the ethical issues involved in the increasing use of Artificial Intelligence in governance and public decision-making?
b) Efficiency and objectivity are often cited as the greatest strengths of Artificial Intelligence. Can these alone justify its use in matters affecting citizens' rights and welfare? Give reasons for your answer.
c) Suggest a set of ethical principles and institutional safeguards that should guide the responsible use of Artificial Intelligence in public administration. **(250 words, 20 marks)**