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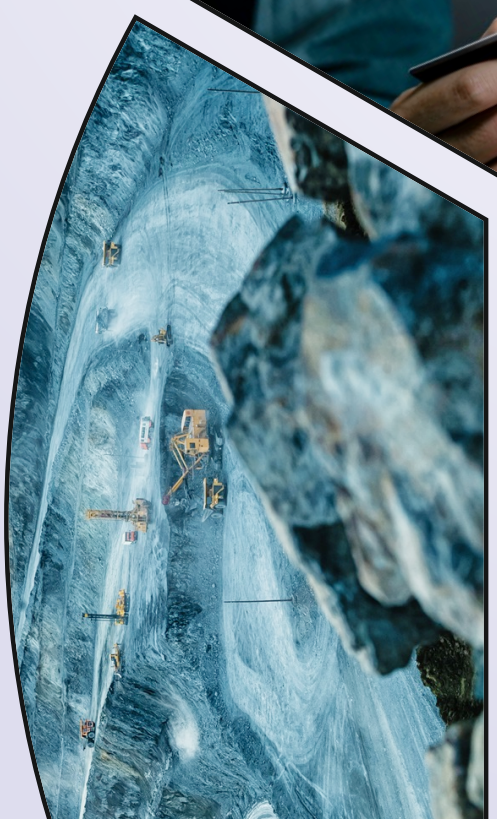
WEEKLY 21st Dec. - 28th Dec. (2025)



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POLITY

PESA at 30: Tribal Self-Governance in Scheduled Areas

📌 Syllabus Mapping

- **GS Paper I** – Indian Society: Tribal Issues
- **GS Paper II** – Polity & Governance: Panchayati Raj, Constitutional Provisions, Fifth Schedule
- **GS Paper IV** – Ethics & Values: Participatory Governance, Social Justice

Introduction (Contextual Background)

The **30th anniversary of the Panchayats (Extension to Scheduled Areas) Act, 1996 (PESA)** marks three decades of India's constitutional commitment to **tribal self-rule and participatory democracy** in Fifth Schedule areas under **Article 244** of the Constitution. Enacted to extend the Panchayati Raj framework to tribal-dominated regions, PESA sought to correct historical marginalisation by placing the **Gram Sabha at the centre of governance**. However, despite its transformative intent, implementation gaps continue to limit its potential.

Background: Why PESA Was Enacted

- **Panchayati Raj Institutions (PRIs)** were granted constitutional status through the **73rd Constitutional Amendment Act, 1993**, establishing a three-tier system of local governance.
- However, **Scheduled Areas**—owing to their distinct socio-cultural and customary systems—were **excluded** from the automatic application of the 73rd Amendment.
- To address this gap, PESA was enacted to extend PRIs to **Fifth Schedule areas** across **10 states**:
  - Andhra Pradesh, Chhattisgarh, Gujarat, Himachal Pradesh, Jharkhand, Madhya Pradesh, Maharashtra, Odisha, Rajasthan, and Telangana.

Salient Features of the PESA Act, 1996

1. Gram Sabha-Centric Governance

- **Mandatory consent of Gram Sabha** for:
  - Land acquisition and development projects
  - Management of **Minor Forest Produce (MFP)** and minor minerals
  - Utilisation of local natural resources

🔑 **Significance**: Embodies the principle of **prior informed consent**, aligning with global norms on indigenous rights.

2. Extensive Powers to Local Institutions

Gram Sabhas and Panchayats are empowered to:

- Regulate or prohibit **sale and consumption of intoxicants**
- Prevent **land alienation** and restore unlawfully alienated land
- Manage **village markets**
- Exercise control over **money-lending**

🔑 **Governance Value**: Enables protection against exploitation by markets, moneylenders, and external actors.

3. Protection of Tribal Culture and Customary Law

- Recognises:
  - **Traditional governance systems**
  - Customary practices and dispute resolution mechanisms
  - Cultural identity of tribal communities

🔑 *Elinor Ostrom's theory of commons governance* supports such community-led resource management as more sustainable and legitimate.

4. Legal Supremacy of PESA

- **Overrides general constitutional provisions and state laws** in Scheduled Areas to the extent of inconsistency.
- States are required to align their Panchayati laws with PESA principles.

Three Decades On: Why PESA Remains Under-Realised

Structural Challenge	Manifestation
No mandatory timeline	Delays in framing state PESA rules
Bureaucratic dominance	Gram Sabhas reduced to advisory bodies
Inadequate devolution	Lack of **Funds, Functions, and Functionaries (3Fs)**
Limited awareness	Tribal communities often unaware of their statutory powers

🔑 **Critical Insight**: The spirit of **self-rule (Swaraj)** envisioned by **Gandhi and Ambedkar** remains only partially realised.

Recent Initiatives to Strengthen PESA Implementation

1. PESA–GPDP Portal (September 2024)

- Digital platform for:
  - Planning
  - Monitoring development activities
  - Transparent resource allocation in Scheduled Areas

2. Institutional Capacity Building

- The **Ministry of Panchayati Raj** has:
  - Established a **dedicated PESA Cell**
  - Initiated **Centres of Excellence** in central universities, such as **Indira Gandhi National Tribal University**, to institutionalise training and research

3. Linguistic and Cultural Outreach

- Training manuals translated into:
  - Regional languages (Telugu, Marathi, etc.)
  - Tribal languages such as **Santhali, Gondi, Bhili, and Mundari**

🔑 **Inclusion Dimension**: Enhances accessibility and ownership among tribal communities.

Broader Significance

Dimension	Relevance
Constitutionalism	Strengthens Fifth Schedule protections
Social Justice	Empowers ST communities
Governance	Deepens grassroots democracy
Development	Promotes culturally sensitive development
Ethics	Upholds consent, dignity, and participation

Conclusion

As PESA completes **30 years**, it stands as a **visionary yet incompletely realised framework** for tribal self-governance. While recent digital, institutional, and linguistic initiatives signal renewed intent, meaningful transformation requires **time-bound rule-making, genuine devolution of 3Fs, and reversal of bureaucratic centralisation**. Strengthening PESA is essential not only for tribal welfare but also for advancing **constitutional morality, participatory governance, and inclusive development** in India's Scheduled Areas.

Mains Practice Question

"Thirty years after its enactment, the Panchayats (Extension to Scheduled Areas) Act, 1996 remains a powerful yet under-implemented instrument of tribal self-governance. Critically examine the reasons for its limited success and suggest measures to strengthen its implementation."

GOVERNANCE

Digital Governance for Citizen-Centric Administration

📌 Syllabus Mapping

- **GS Paper II** – Governance, Public Administration, E-Governance
- **GS Paper IV** – Ethics in Governance: Accountability, Transparency, Public Service Values

Introduction (Contextual Background)

Recent **digital and capacity-building initiatives** launched by the **Department of Personnel and Training (DoPT)**highlight the Government of India's sustained push towards **citizen-centric, efficient, and accountable administration**. These reforms are anchored in the belief that **technology-enabled governance**, combined with continuous capacity building of civil servants, is central to delivering responsive public services in a complex and digitally empowered society.

Key Digital Initiatives under Capacity Building Mission

1. New Features on the iGOT Karmayogi Platform

The **iGOT Karmayogi** portal—core to Mission Karmayogi—has been upgraded with advanced AI-driven tools:

- **iGOT AI Sarthi**
  - Enables **intelligent discovery of relevant learning resources**
  - Maps learning needs to competencies and roles of officials
- **iGOT AI Tutor**
  - Provides **personalised, in-course academic support**
  - Enhances learning outcomes through adaptive feedback

🔑 **Governance Significance**:
Shifts civil service training from **one-size-fits-all** to **competency-based, personalised learning**.

2. Karmayogi Digital Learning Lab 2.0

- A **next-generation digital content creation facility**
- Uses:
  - **Augmented Reality (AR)**
  - **Virtual Reality (VR)**
  - **Gamification**
  - **Interactive simulations**

🔑 **Capacity-Building Value**:
Enables creation of **immersive, practice-oriented learning modules**, improving decision-making and service delivery skills of officials.

Role of Digitisation in Citizen-Centric Administration

1. Transforming Public Administration

- Digitisation replaces **rigid, paper-based processes** with:
  - Agile workflows
  - Real-time data access
  - Faster inter-departmental coordination

🔑 *Max Weber's bureaucracy*, characterised by hierarchy and rules, is being complemented by **networked digital governance**.

2. Enhancing Service Delivery

- Online platforms ensure:
  - **Anytime–anywhere access** to services
  - Reduced physical visits
  - Faster processing and transparency

🔑 **Outcome**: Reduced transaction costs for citizens and the state.

3. Strengthening Citizen Engagement

- Digital tools facilitate:
  - Feedback mechanisms
  - Online consultations
  - Grievance redressal systems

🔑 **Democratic Dimension**: Promotes **two-way communication**, deepening participatory governance.

4. Personalised and Efficient Citizen Services

- Citizen-facing digital services increasingly mirror **private-sector efficiency** through:
  - Mobile-first access
  - Real-time updates
  - Service personalisation

5. Accountability, Transparency, and Trust

- Digital records and audit trails:
  - Reduce discretionary power
  - Minimise corruption
  - Enhance institutional trust

🔑 **Ethical Governance**: Aligns with principles of **probity and transparency**.

6. Administrative Efficiency and Cost Reduction

- Automation of routine tasks:
  - Cuts delays and human errors
  - Lowers operational costs
  - Allows officials to focus on **policy and service outcomes**

7. Data-Driven Governance

- Digitised systems generate:
  - Real-time and granular data
- Enables:
  - Evidence-based policymaking
  - Performance monitoring
  - Targeted interventions

🔑 *Peter Drucker's insight*: "What gets measured gets managed."

Conclusion

Digital initiatives led by DoPT reflect a decisive shift towards **citizen-centric, transparent, and performance-oriented governance**. Platforms such as **iGOT Karmayogi** and innovations like **AI-driven learning and immersive digital labs**strengthen the **capacity of civil servants**, while digitisation transforms how the state engages with citizens. To fully realise this vision, continued focus on **digital inclusion, data security, and ethical use of AI** will be essential in building **trust-based, responsive public administration**.

Mains Practice Question

"Digitisation has become a key enabler of citizen-centric administration in India. Examine how recent digital and capacity-building initiatives contribute to efficiency, accountability, and participatory governance."

PMGSY at 25: Rural Connectivity and Inclusive Growth

📌 Syllabus Mapping

- **GS Paper II** – Governance: Welfare Schemes, Rural Development
- **GS Paper III** – Infrastructure: Roads, Inclusive Growth, Poverty Alleviation

Introduction (Contextual Background)

The **Pradhan Mantri Gram Sadak Yojana (PMGSY)** completes **25 years** as India's flagship programme for **last-mile rural road connectivity**. Since its launch in **December 2000**, PMGSY has emerged as a cornerstone of **inclusive growth**, linking rural habitations to markets, schools, and healthcare, thereby addressing structural rural–urban disparities.

Performance Snapshot (as of December 2025)

- **Roads sanctioned**: **~8,25,000 km**
- **Roads completed**: **~7,87,000 km**
- **Physical progress**: **~95%**

🔑 **Inference**: PMGSY demonstrates strong execution capacity and sustained public investment in rural infrastructure.

About PMGSY

- **Nodal Ministry**: **Ministry of Rural Development**
- **Scheme Type**: **Centrally Sponsored Scheme**
- **Core Objective**:
  Provide **all-weather road connectivity** to eligible unconnected rural habitations as a **poverty alleviation strategy**; includes construction/modernisation of **bridges** along road alignments.

Habitation Population Criteria (PMGSY–IV; Census 2011)

- **Plains**: **500+**
- **North-Eastern & Special Category/Hill States**: **250+**
- **LWE-Affected Districts**: **100+**

Phases of PMGSY: Evolution Over Time

PMGSY–I (2000)

- Laid the foundation for **universal rural access**
- Connected villages to **markets, education, and healthcare**

PMGSY–II (2013)

- Focused on **consolidation and upgradation** of the existing rural road network

PMGSY–III (2019)

- Strengthened links between rural habitations and **key socio-economic institutions** (mandis, schools, hospitals)

PMGSY–IV (2024–28)

- Target: **25,000 habitations**
- Coverage: **62,500 km** of new roads

Special Vertical: LWE-Affected Areas

- **Road Connectivity Project for Left Wing Extremism (RCPLWE)** launched in **2016**
- Implemented as a **vertical under PMGSY**
- Objective: Improve access in **security-challenged districts**, enabling service delivery and economic integration

Developmental Significance of PMGSY

Dimension	Impact
Economic	Lower transport costs, market access for farmers
Social	Better access to health and education
Governance	Improved service delivery reach
Security	Enhanced state presence in LWE areas
Equity	Focus on remote and vulnerable regions

🔑 *Albert Hirschman's linkage effects* apply here—rural roads create strong **forward and backward linkages** across the economy.

Conclusion

At **25 years**, PMGSY stands as one of India's most impactful rural infrastructure programmes, delivering **near-universal connectivity** and catalysing **rural transformation**. As PMGSY–IV unfolds, sustained focus on **quality, climate-resilient construction, maintenance, and integration with livelihoods and services** will be critical to maximise long-term gains and advance **inclusive, regionally balanced development**.

Mains Practice Question

"Assess the role of the Pradhan Mantri Gram Sadak Yojana (PMGSY) in promoting inclusive rural development in India. Examine its evolution and future priorities."

INTERNATIONAL RELATIONS

India–New Zealand FTA: Strategic Trade Partnership

📌 **Syllabus Mapping**

- **GS Paper II** – International Relations: Bilateral & Regional Groupings, Economic Diplomacy
- **GS Paper III** – Indian Economy: External Sector, Trade Policy, MSMEs, Investment

Introduction (Contextual Background)

India and **New Zealand** have announced a **landmark Free Trade Agreement (FTA)**, concluded at a rapid pace compared to India's earlier trade negotiations. This agreement is among India's **fastest-concluded FTAs**, following six FTAs signed in the last five years, the most recent being with **Oman**. The development reflects India's evolving **export-led growth strategy** amid rising protectionism globally.

Understanding a Free Trade Agreement (FTA)

A **Free Trade Agreement** is a pact between two or more countries to:

- Reduce or eliminate **tariffs and non-tariff barriers**
- Liberalise **trade in goods and services**
- Provide **investment protection**
- Safeguard **intellectual property rights**

🔑 **Purpose**: Enhance trade flows, investment, and economic cooperation while improving competitiveness.

Salient Features of the India–New Zealand FTA

1. Zero-Duty Market Access

- **100% elimination of customs duties** on Indian exports to New Zealand
- Enhances price competitiveness of Indian goods in sectors such as **textiles, pharmaceuticals, engineering goods, and processed foods**

2. Healthcare & Traditional Medicine Cooperation

- Inclusion of the **first-ever Annex on Health and Traditional Medicine Services** signed by New Zealand
- Facilitates:
  - Recognition of traditional systems (Ayush-related services)
  - Collaboration in healthcare delivery and wellness services

🔑 **Soft Power Dimension**: Strengthens India's cultural and knowledge-based exports.

3. Agricultural Value Chain Integration

- Establishment of an **Agricultural Productivity Partnership**
- Focus on:
  - Improving farm productivity
  - Technology transfer
  - Integrating Indian farmers into **global agricultural value chains**

Why FTAs Matter for India: Multi-Dimensional Significance

1. Export Market Diversification

- Reduces dependence on traditional markets such as the **USA**, which recently imposed **high tariff barriers on Indian goods**

- Enhances resilience against **trade shocks and protectionist trends**

2. Long-Term Investment Inflows

- New Zealand has committed to invest **USD 20 billion over 15 years**
- Expected to benefit sectors such as:
  - Renewable energy
  - Food processing
  - Infrastructure and logistics

3. MSME Integration into Global Value Chains

- FTAs help **Indian MSMEs** access:
  - Larger markets
  - Stable demand
  - Technology and quality standards

🔑 **Economic Impact**: Boosts exports, employment generation, and regional development.

4. Skilled Mobility and Services Trade

- Provision for **temporary employment entry visas**:
  - Up to **5,000 Indian professionals** at any given time
  - Sectors: **IT, engineering, professional services**

🔑 **Human Capital Advantage**: Leverages India's skilled workforce in global labour markets.

5. Improved Trade Competitiveness

- **Zero or low tariffs** reduce landed costs of Indian goods
- Encourages firms to scale up and innovate

6. Strategic and Geopolitical Value

- Strengthens **economic diplomacy**
- Deepens India's engagement in the **Indo-Pacific**
- Enhances India's credibility as a reliable trade partner

Broader Strategic Context

Dimension	Relevance
Economic	Supports export-led growth and investment inflows
Strategic	Reinforces Indo-Pacific partnerships
Social	Employment and skill mobility opportunities
Global Trade	Signals India's openness amid global protectionism

Conclusion

The India–New Zealand FTA represents a **strategic convergence of trade, investment, and diplomacy**. By offering **zero-duty access, services liberalisation, agricultural cooperation, and skilled mobility**, the agreement strengthens India's pursuit of **diversified exports, MSME integration, and long-term economic resilience**. As global trade becomes increasingly fragmented, such FTAs will play a crucial role in enhancing India's **competitiveness, strategic influence, and sustainable growth trajectory**.

Mains Practice Question

"Free Trade Agreements are increasingly central to India's external economic strategy. Analyse the significance of the India–New Zealand Free Trade Agreement in enhancing India's trade diversification, investment prospects, and strategic partnerships."

CYBER SECURITY

Financial Fraud Risk Indicator: India's Cyber Shield

📌 Syllabus Mapping

- **GS Paper II** – Governance, Internal Security, Role of Government Agencies
- **GS Paper III** – Cyber Security, Digital Economy, Financial Systems

Introduction (Contextual Background)

India's expanding digital payments ecosystem has been accompanied by a sharp rise in **cyber-enabled financial frauds**. In this context, the **Financial Fraud Risk Indicator (FRI)**—introduced by the **Department of Telecommunications(DoT)**—has emerged as a critical preventive tool, reportedly **averting cyber fraud losses worth ₹660 crore**. The initiative reflects a shift from reactive enforcement to **predictive, intelligence-led governance**.

What is the Financial Fraud Risk Indicator (FRI)?

Core Concept

- **FRI** is a **risk-assessment and early-warning tool** designed to identify **mobile numbers potentially involved in financial fraud**.
- It is a **multi-dimensional analytical instrument** developed under the **Digital Intelligence Platform (DIP)**.

Operational Mechanism

- **Risk Categorisation** of mobile numbers into:
  - **Medium Risk**
  - **High Risk**
  - **Very High Risk**
- **Data Inputs** sourced from:
  - Banks and financial institutions
  - Telecom Service Providers (TSPs)
  - Law-enforcement agencies
  - Citizen complaints and reports

🔑 **Analytical Value**: Combining telecom metadata with financial intelligence enables **real-time risk profiling**.

Utility for Financial Ecosystem

- Enables banks and fintech entities to:
  - Generate **early fraud alerts**
  - Apply **enhanced due diligence**
  - **Block or delay suspicious transactions**
- Shifts fraud management from **post-loss recovery** to **pre-emptive prevention**.

Digital Intelligence Platform (DIP): The Backbone

Key Features

- A **secure, real-time data-sharing platform**
- Connects:
  - Telecom operators
  - Banks and fintech companies
  - Government and security agencies

Coverage and Scale

- **1000+ onboarded organisations**, including:
  - Central security agencies
  - **36 State/UT Police forces**
  - Banks and financial institutions
  - Social media platforms such as **WhatsApp**

Strategic Utility

- Enables **rapid intelligence exchange**
- Detects and disrupts **misuse of telecom identifiers** (SIMs, numbers, messaging platforms) commonly exploited in cyber frauds.

Broader Cyber Fraud Prevention Architecture in India

1. Legal Framework

- **Information Technology Act, 2000**
  - Provides statutory backing for cybercrime investigation and prosecution
  - Covers offences related to identity theft, cheating by personation, and data misuse

2. Institutional Mechanisms

- **Indian Cyber Crime Coordination Centre (I4C)** under the **Ministry of Home Affairs**
  - National nodal body for:
    - Coordination among states
    - Investigation support
    - Capacity building against cybercrime
- **Citizen Financial Cyber Fraud Reporting and Management System**
  - Enables **real-time reporting**
  - Facilitates **faster fund freezing and recovery**

3. Telecom-Centric Preventive Initiatives

- **Sanchar Saathi Initiative**
  - Empowers mobile subscribers
  - Includes **"Chakshu"** feature to report **suspected fraud calls and messages**
- **Samanvaya Platform**
  - Provides **analytics-based inter-state linkages**
  - Helps identify **networks of cyber criminals** across jurisdictions

Significance of FRI

Dimension	Relevance
Governance	Data-driven, anticipatory regulation
Internal Security	Disrupts organised cybercrime networks
Financial Stability	Protects consumers and digital payment trust
Technology	Demonstrates AI-enabled risk analytics
Citizen-Centricity	Reduces financial losses and grievance burden

Conclusion

The **Financial Fraud Risk Indicator** represents a paradigm shift in India's cybercrime response—from fragmented, reactive measures to **integrated, intelligence-led prevention**. By leveraging **telecom-financial convergence, real-time data sharing, and institutional coordination**, FRI has demonstrably reduced cyber fraud losses. Going forward, sustained success will depend on **privacy-by-design safeguards, continuous algorithmic refinement, and deeper inter-agency collaboration**, ensuring that India's digital economy remains **secure, trusted, and inclusive**.

Mains Practice Question

"The Financial Fraud Risk Indicator (FRI) marks a transition towards predictive governance in combating cyber-enabled financial crimes. Analyse its working, significance, and challenges in the context of India's cyber security framework."

ECONOMY

Towards Atmanirbharta in Minerals and Metals

📌 Syllabus Mapping

- **GS Paper III** – Indian Economy, **Mineral Resources**, Industrial Policy, **Critical Minerals**, Infrastructure
- **GS Paper II** – Governance, Policy Implementation, Parliamentary Oversight

Introduction (Contextual Background)

The **Standing Committee on Coal, Mines and Steel** recently presented its report on **"Self-Reliance in Minerals and Metals"**, outlining a strategic roadmap to reduce India's import dependence and align the mineral sector with the broader visions of **Atmanirbhar Bharat** and **Viksit Bharat**. The report assumes importance in the context of rising global resource nationalism, supply-chain disruptions, and India's clean energy transition.

Current Status of Self-Sufficiency in Minerals and Metals

1. Minerals with High Self-Reliance

India is **largely self-sufficient** in several key industrial minerals critical for manufacturing and infrastructure:

- **Bauxite**
- **Chromite**
- **Iron ore**
- **Kyanite**
- **Limestone**
- **Sillimanite**

🔑 **Implication**: These minerals provide a stable base for sectors such as **steel, cement, aluminium, and construction**.

2. Minerals with Partial Deficiency

Certain minerals exhibit **domestic shortfalls**, necessitating imports:

- **Magnesite**
- **Manganese ore**
- **Rock phosphate**

🔑 **Concern**: Dependence in these minerals affects **fertiliser production**, **alloy steel**, and **refractory industries**.

3. Complete Import Dependence

India is **100% import-dependent** on several **critical minerals**, including:

- **Lithium**
- **Cobalt**
- **Nickel**

🔑 **Strategic Risk**: These minerals are indispensable for **EV batteries, renewable energy storage, electronics, and defence applications**, making India vulnerable to global supply shocks.

Key Challenges in Achieving Mineral Self-Reliance

1. Operational Delays

- Since 2015, **486 mineral blocks** have been auctioned
- Only **63 blocks are operational**
- **Gestation period** for mining projects ranges from **5 to 14.5 years**

🔑 **Reason**: Delays in **statutory clearances**, land acquisition, and infrastructure availability.

2. Technology Gap

- Limited adoption of **automation, Artificial Intelligence (AI), and Internet of Things (IoT)**
- Results in:
  - Higher extraction costs
  - Lower productivity
  - Reduced exploration efficiency

🔑 **Comparative Perspective**: Countries like **Australia and Canada** use data-driven and autonomous mining extensively, enhancing competitiveness.

3. Exploration Constraints

- Only **~15% of India's geographical area** has undergone **detailed mineral exploration**
- Focus remains largely on **surface deposits**, with minimal deep-seated exploration

🔑 **Structural Issue**: Underinvestment in **risk-intensive exploration** and inadequate private participation.

Major Recommendations of the Standing Committee

1. Urban Mining & Circular Economy

- Promote recovery of minerals from:
  - **E-waste**
  - **Industrial scrap**
  - **Electric vehicle (EV) batteries**

🔑 **Significance**: Reduces import dependence, supports **resource efficiency**, and aligns with **SDG 12 (Responsible Consumption and Production)**.

2. Inter-Ministerial Coordination

- Establish an **Inter-Ministerial Group**
- Objective:
  - Fast-track **post-auction processes**
  - Expedite **environmental and statutory clearances** for critical mineral projects

🔑 **Governance Dimension**: Addresses coordination failures between mining, environment, forest, and tribal welfare authorities.

3. Public–Private Collaboration

- Leverage:
  - **Public Sector Undertakings (PSUs)** for scale and stability
  - **Private sector expertise** for technology and innovation

🔑 **Outcome**: Faster exploration, improved processing capacity, and reduced project delays.

4. Upskilling and Human Capital Development

- Recommend earmarking a portion of **CSR funds** for:
  - Training workforce in **AI, automation, and digital mining tools**

🔑 **Long-Term Impact**: Builds a **future-ready mining workforce**, improving safety and productivity.

Policy Framework Supporting Self-Reliance

1. MMDR Act Amendments (2015–2023)

Key reforms under the **Mines and Minerals (Development and Regulation) Act** include:

- **Transparent e-auction mechanism**
- **Uniform 50-year mining lease period**
- Introduction of **Exploration Licence (EL)** for **29 deep-seated and critical minerals**

🔑 **Reform Significance**: Encourages private investment in high-risk exploration activities.

2. National Critical Mineral Mission (NCMM)

- **National Critical Mineral Mission** launched in **2025**
- Targets **30 identified critical minerals**

- Focus on:
  - Domestic exploration
  - Recycling
  - Strategic stockpiling
  - International partnerships

3. Overseas Mineral Acquisitions

- Undertaken through **KABIL**
  (Joint venture of NALCO, HCL, and MECL)
- Actively pursuing assets in:
  - **Argentina**
  - **Chile**
  - **Australia**

🔑 **Strategic Logic**: Diversifies supply sources and mitigates geopolitical risks.

4. Offshore Mining Initiatives

- In **2024**, the government auctioned the **first tranche of 13 offshore mineral blocks**
- Target minerals:
  - **Construction sand**
  - **Polymetallic nodules**

🔑 **Emerging Dimension**: Aligns with India's aspirations under the **Blue Economy** framework.

Conclusion

The Standing Committee's report underscores that **mineral self-reliance is central to India's economic resilience, energy transition, and strategic autonomy**. While India enjoys strengths in several industrial minerals, structural bottlenecks—such as exploration gaps, technological lag, and procedural delays—continue to constrain progress. A coordinated approach combining **policy reforms, technological upgradation, circular economy practices, and global partnerships** is essential to translate the vision of **Atmanirbhar Bharat** into tangible outcomes in the minerals and metals sector.

Mains Practice Question

"India's pursuit of self-reliance in minerals and metals requires more than resource availability; it demands systemic reforms in exploration, technology, and governance. Analyse in the context of recent recommendations of the Standing Committee on Coal, Mines and Steel."

Revitalising India's Shipbuilding Industry

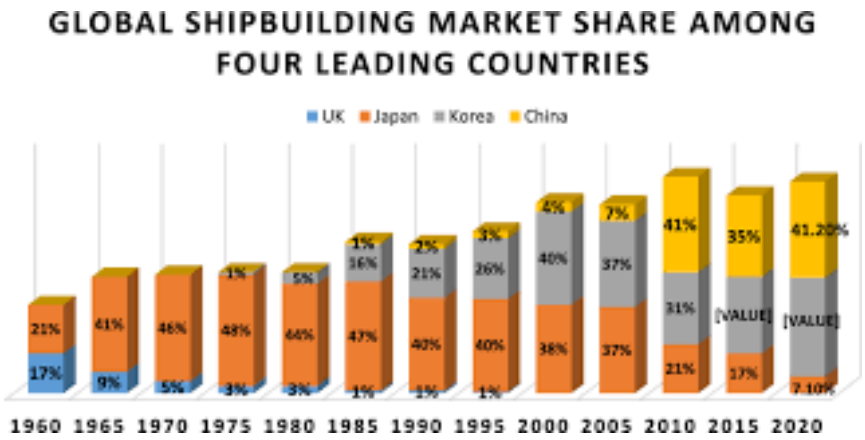
📌 Syllabus Mapping

- **GS Paper III** – Infrastructure, **Heavy Engineering**, Industrial Policy, Blue Economy, Internal & External Trade
- **GS Paper II** – Governance, Strategic & Security Dimensions

Introduction (Contextual Background)

Shipbuilding is often described as the **"mother of heavy engineering"** due to its strong forward and backward linkages with steel, machinery, electronics, logistics, and defence manufacturing. Reviving India's shipbuilding sector is critical for **national security, strategic autonomy, and resilience of trade and energy supply chains**, especially as India aspires to emerge as a global maritime power under **Maritime Amrit Kaal Vision 2047**.

Current Status of Shipbuilding in India



India in the Global Shipbuilding Landscape

- India accounts for **less than 1% of the global shipbuilding market**
- **China** dominates global shipbuilding capacity, followed by **South Korea** and **Japan**

Trade and Strategic Dependence

- **92% of India's external trade** is carried by **foreign-flagged vessels**
- Annual outflow of nearly **$75 billion** as freight payments to foreign shipping companies

Domestic Capacity

- **Cochin Shipyard Limited** has the **largest shipbuilding and ship-repair capacity** in India
- However, overall domestic capacity remains **fragmented and under-scaled**

🔑 **Implication**: Low domestic shipbuilding capacity translates into **strategic vulnerability**, especially during global disruptions such as pandemics or geopolitical conflicts.

Key Challenges Confronting India's Shipbuilding Sector

1. High Capital Costs

- Shipbuilding is **capital-intensive** with long gestation periods
- Limited access to **low-cost, long-term finance** makes scaling up risky
- Indian shipyards face a **cost disadvantage** compared to state-supported East Asian competitors

2. Import Dependence

- Heavy reliance on imported:
  - Advanced ship components
  - Speciality steel
  - Marine engines and propulsion systems

🔑 **Structural Issue**: Weak domestic **marine manufacturing ecosystem** undermines competitiveness.

3. Lower Productivity

- Indian shipyards exhibit:
  - **Longer build cycles**
  - **Lower labour productivity**
  - Outdated technology and limited automation

🔑 **Comparative Perspective**: Chinese shipyards benefit from **automation, modular construction, integrated supply chains, and scale economies**.

4. Supply Chain Constraints

- Absence of **shipbuilding clusters**
- Limited availability of specialised MSMEs for marine equipment
- Poor integration between steel, ports, and shipyards

Why Strengthening Shipbuilding is Strategically Critical

Dimension	Relevance
National Security	Indigenous naval and auxiliary shipbuilding reduces external dependence
Trade Resilience	Enhances control over shipping during crises
Economic Multiplier	High employment and MSME linkage potential
Blue Economy	Supports offshore energy, fisheries, and maritime services
Vision 2047	Core pillar for making India a global maritime hub

Key Government Initiatives to Promote Shipbuilding

1. Financial Support Mechanisms

- **Shipbuilding Financial Assistance Scheme** – Direct financial incentives to Indian shipyards
- **Maritime Development Fund** – Facilitates long-term capital availability for maritime infrastructure

2. Public Procurement Preference

- Under the **Make in India Order, 2017**, ships valued below **₹200 crore** must be procured from **Indian shipyards**

🔑 **Governance Impact**: Assured domestic demand improves viability and investment confidence.

3. Infrastructure Status to Ships

- Ships reclassified as **'infrastructure assets'**
- Enables:
  - Access to **cheaper credit**
  - Longer repayment tenures
  - Improved project bankability

4. Green Shipbuilding Initiatives

- **Haritha Nauka Guidelines**
- **Green Tug Transition Programme (GTTP)**

🔑 **Objective**: Promote **environmentally sustainable vessels**, alternative fuels, and domestic manufacturing of green maritime technologies.

5. Shipbuilding Development Scheme (SbDS)

- Focus areas:
  - **Greenfield shipbuilding clusters**
  - Expansion of existing yards
  - Risk coverage for private investors

6. Long-Term Vision

- **Maritime Amrit Kaal Vision 2047**
  - Aims to position India among the **top global maritime nations**
  - Integrates ports, shipping, shipbuilding, logistics, and human capital

Conclusion

Reviving India's shipbuilding sector is not merely an industrial objective but a **strategic and economic imperative**. Addressing challenges of **high capital costs, technological lag, import dependence, and productivity gaps** requires a coordinated push through **financial reforms, cluster-based development, green shipbuilding, and assured demand**. If effectively implemented, current initiatives can transform India into a **globally competitive shipbuilding hub by 2047**, strengthening **national security, trade sovereignty, and industrial self-reliance**.

Mains Practice Question

"Shipbuilding is critical to India's strategic autonomy and economic resilience. Analyse the challenges faced by India's shipbuilding sector and evaluate the effectiveness of recent policy initiatives aimed at reviving it."

India's Rising Intellectual Property Landscape

📌 **Syllabus Mapping**

- **GS Paper III** – Indian Economy: Innovation, Research & Development, Intellectual Property Rights
- **GS Paper II** – Governance: Institutional Frameworks, Policy Implementation

Introduction (Contextual Background)

The **Annual Report 2024–25** released by the **Office of the Controller General of Patents, Designs & Trade Marks(CGPDTM)** highlights a **robust expansion of India's Intellectual Property Rights (IPR) ecosystem**. The data points to rising domestic innovation, stronger IP awareness, and steady alignment with India's goals of **Atmanirbhar Bharat** and a **knowledge-driven economy**.

Key Highlights from the Annual Report

1. Record Growth in IP Filings

- **Total IPR applications** reached a historic high of **~7.5 lakh**, registering a **~20% year-on-year growth**.
- Reflects:
  - Expanding innovation base

- Improved ease of IP filing
- Greater participation by startups, MSMEs, and academia

2. Dominance of Trademark Filings

- **Trademarks** constituted the largest share:
  - **Over 5.5 lakh applications filed**
- Indicates:
  - Rising brand creation
  - Formalisation of businesses
  - Increased participation of services and MSMEs

3. Surge in Patent Applications

- **Patent filings crossed 1.1 lakh**
- **Indian residents accounted for 61.9%** of total filings

🔑 **Structural Shift**: Marks a transition from **imported innovation** to **indigenous R&D and technology creation**.

4. Broad-Based Growth Across IP Categories

- Increased filings observed in:
  - **Designs**
  - **Copyrights**
  - **Geographical Indications (GIs)**

🔑 **Cultural & Economic Value**: GI growth strengthens **rural economies, artisanship, and traditional knowledge protection**.

Understanding Intellectual Property Rights (IPR)

Definition

Intellectual Property Rights are **exclusive legal rights** granted over creations of the human intellect—such as inventions, designs, and artistic works—for a **limited period**, enabling creators to benefit economically.

Types of IPR in India

Under the **IPR Policy Management (IPRPM) framework**, **eight categories** are recognised:

1. **Patents**
2. **Trademarks**
3. **Industrial Designs**
4. **Copyrights**
5. **Geographical Indications**
6. **Semiconductor Integrated Circuit Layout Designs**
7. **Trade Secrets**
8. **Plant Varieties**

Institutional Framework for IP Administration

- **CGPDTM** functions under the **Department for Promotion of Industry and Internal Trade (DPIIT)**, Ministry of Commerce and Industry.
- Certain IP regimes—such as **Plant Variety Protection**—are administered by the **Ministry of Agriculture and Farmers Welfare**.

🔑 **Governance Insight**: Multi-ministerial administration reflects the **cross-sectoral nature of innovation**.

Government Initiatives to Promote IP Creation and Protection

1. Awareness & Education

- **National Intellectual Property Awareness Mission (NIPAM)**
  - Target: **Educate 1 million students**
  - Objective: Embed IP consciousness early in education

2. Capacity Building

- **SPRIHA Scheme**
  - Integrates IPR education into **higher educational institutions**
  - Builds a pipeline of **IP-literate researchers and entrepreneurs**

3. Policy Framework

- **National IPR Policy, 2016** (under DPIIT)
  - Comprehensive roadmap for:
    - IP creation
    - Protection
    - Commercialisation
  - Aligned with **global best practices** and WTO–TRIPS obligations

4. International Engagement

- India is party to key treaties such as:
  - **Locarno Agreement** (Industrial Designs)
  - **Vienna Agreement** (Trademark classification)

🔑 **Global Integration**: Enhances harmonisation with international IP systems and boosts investor confidence.

5. Digital Transformation

- **IP Saarthi Chatbot**
  - AI-powered assistance for IP queries
  - Improves accessibility, transparency, and user experience

Broader Significance

Dimension	Relevance
Economic Growth	Innovation-led productivity and competitiveness
Governance	Improved institutional efficiency and digitisation
Startups & MSMEs	Brand protection and technology monetisation
Global Standing	Alignment with international IP regimes
Inclusive Development	GI protection supports local communities

Conclusion

The **Annual Report 2024–25 of the CGPDTM** signals a **maturing Indian IPR ecosystem**, characterised by rising domestic patenting, strong trademark activity, and diversified IP creation. Sustaining this momentum will require **faster examination processes, stronger enforcement, and deeper integration of IP with industry and academia**. As India transitions towards a **knowledge and innovation economy**, a robust, accessible, and globally aligned IPR framework will be indispensable.

Mains Practice Question

"The recent surge in intellectual property filings reflects India's transition towards an innovation-driven economy. Analyse the key trends highlighted in the Annual Report 2024–25 of the Controller General of Patents, Designs and Trade Marks and examine the role of government initiatives in strengthening India's IPR ecosystem."

RBI Liquidity Infusion and Monetary Stability

📌 **Syllabus Mapping**

- **GS Paper III** – Indian Economy: Monetary Policy, Banking & Financial Markets
- **GS Paper II** – Governance: Role of Regulatory Institutions

Introduction (Contextual Background)

The **Reserve Bank of India (RBI)** has announced a set of **liquidity infusion measures** to ease tightening conditions in the banking system. The move reflects the central bank's calibrated approach to **maintaining monetary stability while supporting credit growth**, amid external pressures on the rupee and strong domestic demand for loans.

Key Liquidity Measures Announced by RBI

1. Open Market Purchase of Government Securities

- RBI will conduct **Open Market Operations (OMOs)** involving the **purchase of Government Securities (G-Secs) worth ₹2 lakh crore**.
- Objective:
  - Inject **durable rupee liquidity** into the banking system
  - Lower pressure on short-term interest rates

🔑 **Conceptual Clarity – OMOs**

- OMOs are the buying and selling of G-Secs by RBI to **regulate liquidity**.
- **Purchase of securities** → injects liquidity
- **Sale of securities** → absorbs excess liquidity

2. USD/INR Buy–Sell Swap Auction

- RBI will conduct a **3-year USD/INR Buy–Sell Swap auction of USD 10 billion**.
- Mechanism:
  - RBI **buys US dollars** from banks in exchange for **Indian rupees**
  - Simultaneously enters into a forward contract to **sell dollars back at a future date**
- **Eligible Participants**:
  - **Authorised Dealer (AD) Category-I banks**

🔑 **Operational Significance**: This instrument injects rupee liquidity **without permanently expanding the RBI balance sheet**, making it a preferred tool during volatile external conditions.

Why Was Liquidity Infusion Required?

1. Forex Market Interventions

- When the rupee **depreciates sharply**, RBI sells **US dollars from its foreign exchange reserves**
- Banks pay rupees to RBI to buy dollars
- This leads to **withdrawal of rupee liquidity** from the system

2. Strong Credit Growth

- Robust lending by banks reduces **excess reserves**
- High credit offtake tightens liquidity conditions, especially in the inter-bank market

3. Other Transient Liquidity Drains

- **Advance tax outflows**
- Large-scale **Foreign Portfolio Investor (FPI) equity sell-offs**
- Seasonal cash demand spikes

🔑 **Macroeconomic Balance**: RBI aims to avoid excessive tightening that could disrupt **credit transmission and economic momentum**.

Other Liquidity Management Instruments Available with RBI

A. Quantitative (Conventional) Tools

- **Liquidity Adjustment Facility (LAF)**:
  - Repo
  - Reverse Repo
- **Cash Reserve Ratio (CRR)**
- **Statutory Liquidity Ratio (SLR)**
- **Bank Rate**

🔑 **Nature**: These tools directly affect the **quantity and cost of money**.

B. Qualitative (Selective) Tools

- **Credit Rationing**
- **Moral Suasion**
- **Selective Credit Control (SCC)**
- **Margin Requirements**

🔑 **Nature**: These tools influence the **direction and priority of credit**, rather than volume.

Broader Significance of RBI's Move

Dimension	Implications
Monetary Stability	Prevents undue tightening of liquidity
Banking Sector	Supports smooth credit flow
External Sector	Manages rupee volatility without excessive reserve depletion
Growth–Inflation Balance	Ensures liquidity support without compromising inflation control

Policy Credibility	Signals proactive and flexible central banking

Conclusion

The RBI's decision to combine **large-scale OMO purchases with a medium-term USD/INR swap** reflects a **nuanced liquidity management strategy**. By addressing liquidity pressures arising from forex interventions and strong credit demand, the central bank reinforces its commitment to **financial stability, effective monetary transmission, and sustained economic growth**. Such calibrated interventions underscore RBI's evolving toolkit in managing a complex and interconnected macroeconomic environment.

Mains Practice Question

"Discuss the rationale behind the Reserve Bank of India's recent liquidity infusion measures. How do Open Market Operations and USD/INR swap arrangements help the RBI balance monetary stability and growth objectives?"

India's Creator Economy and Consumer Demand

📌 Syllabus Mapping

- **GS Paper III** – Indian Economy: Digital Economy, Growth & Employment
- **GS Paper II** – Governance: Regulation of Digital Platforms, Policy Frameworks
- **GS Paper I** – Society: Youth, Media, Changing Social Behaviour

Introduction (Contextual Background)

A recent report by **Boston Consulting Group (BCG)** projects that **India's creator economy could influence over USD 1 trillion in consumer spending by 2030**. This projection underscores the rapid transformation of India's consumption patterns, driven by **digital creators, social media platforms, and content-led commerce**, placing the creator economy at the heart of India's evolving digital growth story.

Scale and Reach of India's Creator Economy

Current Landscape

- **2–2.5 million creators** active across platforms in India
- Influence **over 30% of Indian consumers**
- Currently impacting **USD 350–400 billion** in consumer spending

🔑 **Key Insight**: The creator economy has shifted from a niche marketing tool to a **mainstream consumption driver**.

Drivers of Rising Creator-Influenced Spending

1. Supporting Digital Infrastructure

- **Digital content watch time**:
  - Increased from **6.6 hours/week (FY 2020)**
  - To **10.9 hours/week (FY 2024)**
- **Internet users**:
  - Grew from **~740 million (FY 2020)**
  - To **~950 million (FY 2024)**

🔑 **Structural Enabler**: Affordable data, smartphone penetration, and digital public infrastructure have expanded content reach at scale.

2. Demographic and Geographic Expansion

- Creator ecosystem now extends beyond:
  - **Gen Z**
  - **Tier-1 metropolitan cities**
- Increasing influence across:
  - Older age cohorts
  - Tier-2 and Tier-3 cities

🔑 **Social Dimension**: Reflects democratisation of content creation and consumption.

3. Content Formats and Consumption Trends

- **Short-form video** is the dominant format
- Most consumed genres:
  - Comedy

  - Films and daily soaps
  - Fashion and lifestyle

🔑 **Behavioural Shift**: Attention spans and discovery mechanisms are increasingly **video-first and creator-led**.

4. Rising Brand Participation

- **70% of brands** plan to increase creator marketing budgets by **1.5–3 times** in the next **2–3 years**
- Indicates a strategic shift from:
  - Traditional advertising
  - To **creator-driven, trust-based marketing**

Understanding the Creator (Orange) Economy

Meaning

The **creator economy** refers to an ecosystem comprising:

- **Content creators**
- **Digital platforms**
- **Brands**
- **Third-party intermediaries**

These actors collaborate to generate revenue through:

- Advertising
- Sponsorships
- Subscriptions
- Social commerce and affiliate models

Creators produce content—videos, posts, livestreams—offering **authenticity, relatability, and niche expertise**, which increasingly shapes consumer decisions.

Economic and Social Significance

1. Contribution to Economic Growth

- **YouTube** reported that its creative ecosystem alone contributed **over ₹16,000 crore to India's GDP in 2024**

🔑 **Macro Impact**: Signals the emergence of content creation as a **formal economic activity**.

2. Employment and Innovation

- Generates livelihoods for:
  - Influencers
  - Video editors
  - Designers
  - IT and analytics professionals
- Encourages innovation in:
  - Content formats
  - Monetisation models
  - Digital storytelling

3. Cultural and Soft Power Effects

- Amplifies:
  - Local languages
  - Regional cultures
  - Grassroots narratives

🔑 **Soft Power Dimension**: Indian creators increasingly influence global audiences.

Key Challenges Facing the Creator Economy

1. Monetisation Volatility

- Income remains:
  - Platform-dependent

    - Algorithm-sensitive
- Lack of predictable earnings for small and mid-tier creators

2. Platform Dominance and Algorithmic Control

- Sudden changes in algorithms can:
    - Reduce visibility
    - Affect livelihoods

3. Intellectual Property and Data Protection

- Weak enforcement of:
    - Copyrights
    - Content ownership rights

4. Trust and Authenticity Concerns

- Issues of:
    - Fake followers
    - Inflated engagement metrics
- Risk of erosion of consumer trust

Policy and Governance Perspective

Dimension	Implication
Economic Policy	Recognising creators as part of the formal digital economy
Regulation	Need for transparency in algorithms and advertising
Employment	New-age livelihoods for youth
Social Impact	Cultural pluralism and inclusion
Consumer Protection	Disclosure norms and authenticity standards

Conclusion

India's creator economy is rapidly evolving into a **powerful driver of consumption, employment, and digital innovation**. As projections of **USD 1 trillion in creator-influenced spending by 2030** suggest, the sector holds transformative potential. However, realising this promise will require **stable monetisation frameworks, stronger IP protection, platform accountability, and consumer trust safeguards**. With the right policy support, the creator economy can become a **sustainable pillar of India's digital and cultural economy**.

Mains Practice Question

"India's creator economy is emerging as a significant driver of consumer spending and employment. Analyse its growth drivers, economic significance, and the regulatory challenges associated with it."

Industrial Parks and Manufacturing Growth

📌 Syllabus Mapping

- **GS Paper III** – Indian Economy: Industrial Policy, Infrastructure, Manufacturing, Investment
- **GS Paper II** – Governance: Centre–State Cooperation, Ease of Doing Business

Introduction (Contextual Background)

Industrial Parks (IPs) are increasingly emerging as a **core pillar of India's industrialisation and innovation strategy**. Developed through **Centre–State collaboration and private participation**, these parks offer **shared infrastructure, plug-and-play facilities, single-window clearances, and regulatory predictability**, thereby aligning with India's objectives of **Make in India, Atmanirbhar Bharat, and Viksit Bharat**.

Status of Industrial Parks in India

- India currently has **over 4,500 industrial parks**, as recorded on the **India Industrial Land Bank (IILB)**.
- Under the **National Industrial Corridor Development Corporation (NICDC)**:
    - **306 plug-and-play industrial parks** are under development
    - **20 industrial parks and smart cities** are being developed along major industrial corridors

🔑 **Structural Shift**: The focus has moved from **scattered industrial units** to **cluster-based, infrastructure-led industrial ecosystems**.

Key Benefits of Industrial Parks

1. Economic Growth and Competitiveness

- Efficient integration of **scarce factors of production** (land, power, logistics, skills)
- Higher **productivity and operational efficiency**
- Strong **FDI attraction**:
  - India ranks among the **top 5 global destinations for greenfield investment**, as per **UNCTAD**
- Generates:
  - Large-scale **employment**
  - **Higher and more stable wages**
  - MSME–large industry linkages

🔑 *Alfred Marshall's industrial district theory* supports such agglomeration-led efficiency gains.

2. Innovation and Industrial Upgradation

- Co-location of firms enables:
  - Knowledge spillovers
  - Supplier–buyer integration
  - Faster adoption of new technologies
- Facilitates movement towards **advanced manufacturing and Industry 4.0**

3. Environmental and Social Responsibility

- Promotion of:
  - **Resource efficiency**
  - Common effluent treatment plants
  - Renewable energy usage
- Social infrastructure:
  - **Gender-sensitive facilities**
  - Health, safety, and security systems
  - Worker housing and transport

🔑 **Sustainability Dimension**: Supports India's climate commitments while ensuring inclusive industrial growth.

Government Initiatives to Promote Industrial Parks

1. Plug-and-Play Industrial Parks

- **Union Budget 2025–26** allocated **₹2,500 crore** for developing **plug-and-play industrial parks**
- Objective:
  - Reduce gestation period
  - Enable firms to start operations quickly

2. India Industrial Land Bank (IILB)

- Developed by the **Department for Promotion of Industry and Internal Trade**
- GIS-enabled platform providing:
  - Spatial and non-spatial data on industrial land
  - Information on connectivity, utilities, and approvals

🔑 **Governance Value**: Enhances transparency and investment decision-making.

3. Industrial Park Rating System (IPRS)

- A comprehensive framework to assess:
  - Infrastructure quality
  - Governance
  - Sustainability
  - Investor services
- **IPRS 3.0** (launched September 2025):
  - Added parameters on:
    - **Sustainability**
    - **Skill linkages**
    - **Digitalisation**

4. Ease of Doing Business Reforms

- **National Business Reforms Action Plan (BRAP), 2014**
- **Goods and Services Tax (GST)**:
  - Unified national market
  - Reduced compliance burden
- Streamlined approvals and regulatory simplification

Broader Significance

Dimension	Relevance
Manufacturing	Boosts Make in India
Investment	Attracts domestic & foreign capital
Employment	Large-scale job creation
Innovation	Encourages industrial clustering
Federalism	Cooperative Centre–State development
Sustainability	Green and inclusive industrialisation

Conclusion

Industrial Parks have evolved into **strategic growth nodes** driving **manufacturing competitiveness, innovation, and employment generation** in India. Backed by **plug-and-play infrastructure, digital land banks, performance-based ratings, and ease-of-doing-business reforms**, they are reshaping India's industrial geography. Going forward, integrating **skill ecosystems, R&D institutions, and sustainable practices** will be critical to ensuring that Industrial Parks remain **globally competitive, environmentally responsible, and socially inclusive**.

Mains Practice Question

"Industrial Parks are increasingly shaping India's manufacturing and innovation landscape. Examine their economic significance and evaluate the policy measures taken to strengthen their role in India's industrial growth."

Manufacturing in India: Challenges and Reforms

📌 Syllabus Mapping

- **GS Paper III** – Indian Economy: Manufacturing, Industrial Policy, Structural Transformation
- **GS Paper II** – Governance: Policy Frameworks, Institutional Reforms

Introduction (Contextual Background)

India's growth trajectory stands in contrast to peers such as China and South Korea, where **manufacturing acted as the principal engine of structural transformation**. In India, however, manufacturing has not expanded commensurately with overall economic growth, resulting in **premature deindustrialisation** and a limited shift of labour from low-productivity agriculture to high-productivity industry.

Understanding India's Manufacturing Stagnation

Dutch Disease Perspective

India's manufacturing slowdown can be partially interpreted through the lens of **Dutch disease**—an economic phenomenon where a boom in one sector leads to:

- Rising wages and costs
- Reduced competitiveness of tradable sectors, especially manufacturing
- Gradual **deindustrialisation**

In India's context, **rising public sector wages and services-led growth** have crowded out industrial competitiveness without a corresponding manufacturing expansion.

Current Status of Manufacturing in India

- **Share in GDP**: **~17%**
  - China: **25–29%**
  - South Korea: **~27%**
  - Vietnam: **~24%**
- **Employment Structure**:
  - Manufacturing: **~11.4%** of workforce
  - Agriculture: **~45%**
  - Services: **~29%**

🔑 **Structural Concern**: Manufacturing has neither absorbed surplus labour from agriculture nor generated sufficient productive employment.

Key Factors Behind Manufacturing Underperformance

1. Informality and Low Productivity

- Dominance of informal employment:
  - Limits skill formation
  - Restricts technology diffusion
  - Weakens quality upgradation and stable industrial relations

🔑 **Outcome**: Persistent low productivity traps.

2. Absence of Economies of Scale

- Industrial landscape dominated by **micro and small enterprises**
- Firms fail to:
  - Scale production
  - Integrate into global value chains
  - Compete internationally

3. Low Innovation and R&D Intensity

- **Gross Expenditure on R&D (GERD)**: **0.6–0.7% of GDP**
  - Significantly lower than China and the USA

🔑 **Implication**: Weak innovation ecosystem constrains movement up the **manufacturing value chain**.

4. Divergent Growth Architecture

- India: **Consumption-led growth model**
- China: **Investment- and export-led growth model**

🔑 **Structural Impact**: Consumption-driven growth boosts services but does not create sustained demand for manufacturing capacity.

5. Other Structural Bottlenecks

- Limited automation and advanced technology adoption
- High logistics and transaction costs
- Fragmented land markets and regulatory complexity

Way Forward: Revitalising Indian Manufacturing

1. Strategic Deployment of Frontier Technologies

India must prioritise large-scale adoption of:

- **Artificial Intelligence / Machine Learning**
- **Robotics and automation**
- **Advanced materials**
- **Smart manufacturing systems**

🔑 **Objective**: Leapfrog traditional industrial pathways.

2. Scaling Up R&D Investment

- Incentivise **private sector R&D**
- Establish:
  - **Centralised Research Hubs**
  - **Technology Transfer Offices (TTOs)**
- Policy direction advocated by **NITI Aayog**

3. Workforce Upskilling

- Revamp curricula of:
  - **Industrial Training Institutes (ITIs)**
  - **Polytechnics**
- Align training with:

- Industry 4.0
- Advanced manufacturing requirements

🔑 **Human Capital Focus**: Productivity-driven employment.

4. Development of Industrial Clusters

- Promote **Plug-and-Play industrial parks** enabled with:
  - Shared R&D facilities
  - **5G networks**
  - Testing and certification labs

🔑 **Agglomeration Benefits**: Knowledge spillovers and cost efficiency.

5. Overcoming Structural and Regulatory Barriers

- Reduce bureaucratic hurdles for firm entry and exit
- Lower tariffs on critical raw materials
- Streamline land access and approvals for industrial use

Broader Implications

Dimension	Significance
Employment	Absorption of surplus agricultural labour
Productivity	Shift towards high-value manufacturing
Trade Balance	Reduced import dependence
Innovation	Technology-led industrial upgrading
Inclusive Growth	Regional and skill-based employment

Conclusion

India's manufacturing stagnation reflects **deep structural and policy constraints**, rather than a lack of entrepreneurial potential. Reviving the sector requires a **coherent industrial strategy** anchored in **technology adoption, R&D expansion, skill development, cluster-based industrialisation, and regulatory simplification**. A strong manufacturing base is indispensable for achieving **structural transformation, employment generation, and sustainable long-term growth**—key prerequisites for India's aspiration of becoming a **Viksit Bharat**.

Mains Practice Question

"India's manufacturing sector has not played the transformative role witnessed in many East Asian economies. Analyse the structural reasons for this stagnation and suggest a comprehensive strategy to revitalise manufacturing in India."

SOCIETY AND SOCIAL ISSUES

Towards a Child Marriage–Free India

📌 **Syllabus Mapping**

- **GS Paper I** – Society: Women and Children, Social Issues
- **GS Paper II** – Governance, Social Justice, International Commitments

Introduction (Contextual Background)

The **Child Marriage Free Bharat Campaign** has completed **one year**, marking a renewed national push to eliminate child marriage through **legal enforcement, social mobilisation, and behavioural change**. The campaign gains significance as India balances **measurable progress** with **persistent regional and socio-cultural challenges**.

Understanding Child Marriage: Legal and Global Perspectives

Conceptual Definition

- **Child Marriage** refers to the marriage of a person **before attaining adulthood**.
- Under India's **Prohibition of Child Marriage Act (PCMA), 2006**, the minimum age is:
  - **18 years for females**
  - **21 years for males**

Global Norms

- The **United Nations Convention on the Rights of the Child** defines a child as **any individual below 18 years**, and considers marriages within this age bracket as child marriages.

🔑 **Normative Significance**: Child marriage violates **child rights, gender equality, health, and education outcomes**, making it both a **human rights issue** and a **development challenge**.

Trends and Patterns: Evidence from Data

Declining but Persistent Prevalence

According to the **National Family Health Survey (NFHS)**:

- **47.4% (2005–06)**
- **26.8% (2015–16)**
- **23.3% (2019–21)**

🔑 **Inference**: India has witnessed a **steady decline**, yet nearly **one in four women** continues to be married before the legal age.

Regional Concentration

- States with **high incidence**:
  - **West Bengal**
  - **Bihar**
  - **Tripura**

🔑 **Regional Insight**: High prevalence correlates with **poverty, low female literacy, and entrenched patriarchal norms**.

Key Drivers of Child Marriage

1. Poverty and Economic Insecurity

- Girls are perceived as an **economic liability**
- Early marriage seen as a strategy to **reduce household burden**

2. Patriarchal Social Structures

- **Girls' education** often deprioritised
- Emphasis on **domestic labour and caregiving roles**

🔑 *Amartya Sen's Capability Approach* highlights how denial of education restricts women's **agency and life choices**.

3. Socio-Cultural and Religious Practices

- Certain communities view **pre-puberty marriage as auspicious**
- Social conformity often overrides legal norms

Key Measures Undertaken to Eliminate Child Marriage

1. Legal Framework

- **Prohibition of Child Marriage Act, 2006**
  - Empowers states to appoint **Child Marriage Prohibition Officers (CMPOs)**
  - Enables **annulment of child marriages** and penal provisions

2. Government Schemes

- **Beti Bachao Beti Padhao (BBBP)**
  - Promotes **girl child education**
  - Addresses **gender-biased social norms**

3. Grassroots Innovations

- **Surajpur Model (Chhattisgarh)**:
  - **75 Panchayats** declared **Child Marriage–Free**
  - Community vigilance, local leadership, and adolescent engagement

🔑 **Best Practice**:
Demonstrates the effectiveness of **decentralised, community-led interventions**.

4. International Commitments

- India is a signatory to:
  - **UNCRC**
  - **Sustainable Development Goal 5.3**: Eliminate child, early, and forced marriage by **2030**

Assessment of the Child Marriage Free Bharat Campaign

Dimension	Contribution
Awareness	National visibility to the issue
Governance	Improved convergence among ministries
Community Engagement	Panchayat and civil society participation
Rights-Based Approach	Focus on education, health, and dignity

Conclusion

The completion of one year of the **Child Marriage Free Bharat Campaign** reflects India's commitment to **gender justice, child rights, and inclusive development**. While declining trends indicate progress, persistent regional disparities underscore the need for **deeper social transformation**. A combination of **strong legal enforcement, girls' education, economic empowerment, and community ownership** is essential to achieve a **child marriage–free India by 2030**, in line with constitutional values and global commitments.

Mains Practice Question

"Despite a declining trend, child marriage remains a significant social challenge in India. Examine the structural causes of child marriage and evaluate the role of recent policy and community-based initiatives in addressing the issue."

Globalising India's Higher Education

📌 **Syllabus Mapping**

- **GS Paper II** – Governance, Social Justice, Education Reforms
- **GS Paper I** – Society: Human Capital, Demographic Dividend
- **GS Paper III** – Knowledge Economy, Innovation, Human Resource Development

Introduction (Contextual Background)

The **NITI Aayog** has released a comprehensive report on **"Internationalization of Higher Education in India"**, positioning global integration of universities as a **core pillar of the National Education Policy (NEP) 2020**. The report underscores that India's aspiration to become a **Viksit Bharat** hinges not only on access to education but also on **global quality, mobility, and competitiveness** of its higher education ecosystem.

What Does Internationalization of Higher Education Mean?

Internationalization refers to the systematic integration of **global perspectives, standards, and networks** into India's higher education system through:

- Higher **international student and faculty presence** in Indian HEIs
- Establishment of **campuses of top foreign universities in India**
- Expansion of **Indian HEIs abroad**
- Cross-border research collaboration, joint degrees, and faculty exchanges

🔑 **Core Objective**: Transform India from a **net exporter of students** into a **global education hub**.

Why India Needs Internationalization of Higher Education

1. Rising Outward Remittances

- Spending by Indian students abroad has increased by **over 2,000% in the last decade**
- Reached nearly **USD 3.4 billion in 2023–24**
- Equals **~53% of India's total Union higher education budget**

🔑 **Economic Concern**:
Unchecked outflow strains foreign exchange and reflects **domestic capacity gaps**.

2. Democratization of Quality Education

- **97% of Indian students** study in **domestic institutions**
- Internationalization ensures access to **world-class education within India**, irrespective of socio-economic background

🔑 **Equity Dimension**:
Aligns with **Article 14 (Equality)** and **Article 21A (Right to Education)** in spirit.

3. Global Workforce Readiness

- Embedding:
  - International curricula
  - Global benchmarks
  - Faculty and student mobility
- Prepares India's vast youth population to be **"world-ready"**

🔑 *Human Capital Theory* (Gary Becker): Investment in globally relevant skills enhances national productivity.

4. Addressing Brain Drain & Leveraging Diaspora

- Offers high-quality opportunities within India
- Enables return of global Indian scholars and researchers
- Converts **brain drain into brain circulation**

5. Global Rankings & Soft Power

- Improved **international faculty and student ratios** boost global rankings
- Offshore campuses (e.g., **IIT Delhi in Abu Dhabi**) strengthen **India's education diplomacy and soft power**

Key Policy Recommendations by NITI Aayog

1. Governance Reforms

- Establish an **Inter-Ministerial Task Force** for coordinated implementation
- Designate **Country Centres of Excellence (CoEs)** in **54 Central Universities**
  - Each CoE to act as a **nodal hub for engagement with specific countries**

🔑 **Governance Value**: Reduces fragmentation across ministries and regulators.

2. Regulatory Simplification

- Revise **NIRF rankings** to include:
  - International students
  - Faculty diversity
  - Global collaborations
- Simplify **visa and documentation processes** for foreign students and faculty

3. Financial Architecture

- Launch **Bharat Vidya Kosh**
  - A **USD 10 billion sovereign research fund**
  - To attract global researchers and fund frontier research
- Introduce **Vishwa Bandhu Scholarship**
  - Targeted at international Master's students and researchers

🔑 **Comparative Insight**:
Similar to **China Scholarship Council** and **Fulbright-type programmes**.

4. Branding & Global Outreach

- Create **Bharat ki AAN (Alumni Ambassador Network)**
  - Mobilise successful Indian-origin alumni as global ambassadors
- Upgrade **"Study in India" portal**
  - One-stop digital platform for admissions, visas, scholarships, and support

5. Curriculum & Academic Culture

- Integrate **Indian Knowledge Systems (IKS)** with global academic frameworks
- Mandate:

  - **Industry-linked internships**
  - **Reflective writing and research-based learning**
- Promote interdisciplinary and problem-solving approaches

🔑 *Rabindranath Tagore's vision*: Education must combine **rootedness with openness to the world**.

Broader Implications

Dimension	Significance
Economic	Reduces forex outflow, boosts education exports
Social	Equitable access to global-quality education
Strategic	Enhances India's soft power and global influence
Governance	Aligns institutions with international best practices
Demographic	Converts youth bulge into global talent advantage

Conclusion

Internationalization of higher education is no longer optional for India—it is a **strategic necessity**. As highlighted by NITI Aayog, a calibrated approach combining **regulatory reforms, financial investment, global branding, and curricular transformation** can reposition India as a **knowledge superpower**. By harmonising **Indian intellectual traditions with global academic standards**, India can not only retain talent but also attract the world, fulfilling the NEP 2020 vision of a **globally competitive yet culturally rooted education system**.

Mains Practice Question

"Internationalization of higher education is critical for India's transition into a global knowledge economy. Analyse the rationale and policy recommendations highlighted by NITI Aayog in this regard."

Marginal Farmers and the Role of Cooperatives

📌 Syllabus Mapping

- **GS Paper I** – Indian Society: Rural Issues, Agrarian Structure
- **GS Paper II** – Governance: Cooperatives, Institutional Mechanisms, Inclusion
- **GS Paper III** – Indian Economy: Agriculture, Rural Credit, Inclusive Growth

Introduction (Contextual Background)

The **State of Marginal Farmers in India 2025 Report** provides a critical assessment of **marginal farmers' engagement with cooperative institutions**, highlighting their role as potential catalysts for **poverty reduction, livelihood security, and rural transformation**. As India advances towards inclusive growth, strengthening cooperative linkages for marginal farmers emerges as a key governance and development challenge.

Who are Marginal Farmers and Why Do They Matter?

- **Definition**: Marginal farmers are cultivators owning **less than one hectare of land**.
- **Scale**:
  - Constitute **~65.4% of India's farmers**
  - Control only **~24% of total cultivable land**

🔑 **Structural Reality**:
Despite being the numerical majority, marginal farmers face **disproportionate vulnerability** due to fragmented landholdings and limited bargaining power.

Vulnerability Profile of Marginal Farmers

Marginal farmers face multidimensional constraints, including:

- **Small land size**, limiting economies of scale
- Poor **access to institutional credit**
- High input costs and low market access
- Limited outreach of public services and extension support

🔑 **Economic Implication**:
These constraints trap farmers in **low-productivity, low-income cycles**.

Role of Cooperatives in Marginal Farmers' Lives

For marginal farmers, **Primary Agricultural Credit Societies (PACS)** and agricultural cooperatives function as the **closest and most influential institutional interface** by providing:

- Short-term and crop loans
- Input supply and storage support
- Market access and price realisation mechanisms
- Livelihood diversification opportunities

🔑 **Institutional Significance**:
Cooperatives embody the principle of **collective action**, particularly vital where individual capacity is weak.

Barriers to Effective Cooperative Engagement

1. Farmer-Level Constraints

- Limited awareness of schemes and cooperative benefits
- Lengthy and bureaucratic procedures
- Long distances to PACS offices
- Low levels of **digital literacy**

2. Funding Constraints

- **Inadequate capitalisation of PACS**
- Insufficient credit availability restricting service expansion
- Acute in states such as **Uttarakhand and Maharashtra**

🔑 **Governance Issue**:
Weak financial health reduces cooperatives' ability to act as development institutions.

3. Low Service Uptake

- Shortage of trained staff
- Limited local managerial capacity
- Geographic and logistical barriers in hilly and remote regions

4. Infrastructure Deficits

- Inadequate physical infrastructure
- Shallow digitisation affecting:
  - Transparency
  - Outreach
  - Efficiency
- Evident in states like **Uttarakhand**

5. Gender Gaps

- Cooperatives remain **male-dominated spaces**
- Under-representation of women despite:
  - Their central role in agriculture
  - Contribution to household economic activity

🔑 **Social Dimension**:
This perpetuates **gendered exclusion** in access to institutional support.

Key Recommendations to Strengthen Cooperative Engagement

1. Enhancing PACS Visibility and Outreach

- Community-level awareness campaigns
- Use of **digital tools** for information dissemination
- Promoting **diversified roles of PACS** beyond credit (storage, processing, marketing)

2. Mission-Mode Cooperative Reform

- Adoption of **Farmer-First approach** under the vision of **"Sahkar Se Samridhi"**
- Creation of a **Sahkar Shakti – Sakha/Sakhi cadre** to:

- Facilitate last-mile outreach
- Improve trust and participation

3. Institutionalised Support Systems

- Reducing administrative and compliance burdens
- Promoting **financial and digital inclusion**
- Development of **Digital Public Infrastructure (DPI)** and a **Cooperative Stack**

🔑 **Governance Lens**:
Moves cooperatives from rule-bound entities to **service-oriented institutions**.

4. Dual Institutional Architecture

- Coexistence of:
  - **PACS**
  - **Farmer Producer Companies (FPCs)**
- Observed notably in **Bihar**, creating:
  - Complementary ecosystems
  - Multiple pathways for collective farmer action

Broader Significance

Dimension	Relevance
Agrarian Reform	Strengthens smallholder resilience
Inclusive Growth	Targets the most vulnerable farmers
Cooperative Federalism	Empowers grassroots institutions
Gender Equity	Scope for women-led cooperatives
Digital Governance	DPI-enabled rural institutions

Conclusion

The **State of Marginal Farmers in India 2025 Report** underscores that while cooperatives hold immense potential to transform the lives of marginal farmers, their impact remains **uneven and constrained by structural, financial, and governance challenges**. A **mission-mode reform of cooperatives**, centred on **visibility, capacity building, digitalisation, and gender inclusion**, is essential to realise the vision of **farmer-centric, inclusive rural development**. Strengthened cooperatives can become the backbone of **sustainable agrarian transformation** in India.

Mains Practice Question

"Marginal farmers form the backbone of Indian agriculture but remain institutionally underserved. Examine the role of cooperatives in improving their livelihoods and suggest measures to strengthen cooperative engagement in India."

MODERN HISTORY

Communist Party of India at 100

📌 **Syllabus Mapping**

- **GS Paper I** – Modern Indian History: Freedom Struggle, Political Ideologies
- **GS Paper II** – Polity: Political Parties, Constitutional Developments
- **GS Paper IV** – Ethics & Values: Social Justice, Equality, Mass Mobilisation

Introduction (Contextual Background)

The **Communist Party of India (CPI)** completed **100 years** on **26 December 2025**, marking a century since its founding in **Kanpur (1925)**. As the **first organised all-India communist party**, CPI played a significant role in shaping **working-class politics, anti-imperialist resistance, and constitutional thinking** in modern India. Its centenary invites reflection on its **historical contributions, ideological evolution, and role in India's freedom struggle**.

Genesis and Formation of the CPI

Early International Origins (1920)

- In **1920**, a group of Indian revolutionaries met in **Tashkent**, leading to the formation of the **Communist Party of India in exile**.

- Key figures included:
  - **M. N. Roy**
  - **Mohammad Ali**
  - **M. P. T. Acharya**
  - **Mohammad Shafiq**

🔑 **Ideological Influence**:
The Russian Revolution and Comintern ideas deeply influenced Indian revolutionaries seeking a **class-based anti-colonial struggle**.

Formal Establishment in India (1925)

- CPI was formally founded at the **Kanpur Communist Conference (December 1925)**.
- The conference unified multiple communist groups active across British India into a **single national organisation**.

Early Leadership

- **First President**: **Singaravelu Chettiar**
- **First General Secretaries**:
  - **S. V. Ghate**
  - **J. P. Bagerhatta**

Prominent Leaders of CPI

Over the decades, CPI was shaped by leaders such as:

- **Evelyn Trent-Roy**
- **Abani Mukherjee**
- **Rosa Fitingov**
- **A. K. Gopalan**
- **S. A. Dange**
- **E. M. S. Namboodiripad**
- **P. C. Joshi**
- **Ajay Ghosh**
- **P. Sundarayya**

Role of CPI in India's Freedom Struggle

1. Mass Mobilisation and Popular Politics

- CPI played a central role in organising:
  - Workers through **All India Trade Union Congress (AITUC)**
  - Peasants through **All India Kisan Sabha (AIKS)**
  - Students and women via affiliated organisations

🔑 **Historical Significance**:
CPI expanded the freedom movement beyond elite politics to **class-based mass participation**.

2. Social Reform and Anti-Discrimination Efforts

- Actively supported:
  - **Dalit rights**
  - **Hindu–Muslim unity**
  - Campaigns against **caste oppression and communalism**

🔑 *B. R. Ambedkar's emphasis on social democracy* resonated with CPI's stress on **equality and social justice**.

3. Temple Entry Movement in Kerala

- CPI leaders such as:
  - **A. K. Gopalan**
  - **P. Krishna Pillai**
- Led **satyagrahas at Guruvayur** demanding entry of **Untouchables into temples**.

🔑 **Socio-Religious Impact**:
Linked nationalism with **social emancipation**.

4. Early Demand for Complete Independence

- CPI was among the **first political formations** to demand **Poorna Swaraj**.
- Submitted manifestos to **Indian National Congress sessions in 1921 and 1922**, well before:
  - INC formally adopted Poorna Swaraj at **Lahore Session, 1929**.

5. Contribution to Constitutional Thought

- **M. N. Roy** drafted a **Constitutional proposal in 1934**.
- CPI consistently argued for:
  - A **Constituent Assembly elected by Indians**
  - Popular sovereignty in a free India

🔑 **Legacy**:
Helped shape the intellectual foundations of **India's constitutional democracy**.

Assessment at 100 Years

Dimension	Contribution
Political Ideology	Introduced Marxist discourse in Indian politics
Freedom Struggle	Deepened mass and class participation
Social Justice	Linked nationalism with equality
Labour & Peasantry	Institutionalised worker–farmer politics
Constitutionalism	Advocated constituent assembly early

Conclusion

The **Communist Party of India**, at its centenary, stands as a **pioneering force in India's political and social history**. From advancing **class-conscious mass movements** to articulating early demands for **complete independence and constitutional democracy**, CPI left a lasting imprint on the freedom struggle. While its political fortunes have fluctuated, its legacy in promoting **social justice, labour rights, and egalitarian ideals** remains integral to understanding India's journey towards independence and democratic governance.

Mains Practice Question

"Assess the contribution of the Communist Party of India to India's freedom struggle with special reference to mass mobilisation, social reform, and constitutional thinking."

ENVIRONMENT & ECOLOGY

Reframing Aravalli Conservation

📌 **Syllabus Mapping**

- **GS Paper I** – Physical Geography (Physiographic divisions of India)
- **GS Paper II** – Governance, Judiciary, Environmental Regulation
- **GS Paper III** – Environment, Biodiversity Conservation, Mining & Sustainable Development

Introduction (Context)

Recently, the **Supreme Court of India** accepted a **uniform and scientific definition of the Aravalli landscape**, as recommended by a **Central Government–appointed expert committee**. This marks a significant shift from fragmented protection towards **landscape-level ecological conservation**, addressing long-standing regulatory ambiguities that enabled ecological degradation through mining and urban expansion.

Core Issue: From Fragmented Hills to Landscape-Level Conservation

The Court emphasized that the **Aravallis must be viewed as a continuous geological system**, rather than a collection of isolated hillocks. This approach aligns with modern conservation science, which prioritizes **ecological connectivity, watershed integrity, and biodiversity corridors** over administrative boundaries.

Key Expert Committee Recommendations

1. Operational Definitions (Scientific Standardisation)

To remove ambiguity, the committee proposed clear geomorphological criteria:

- **Aravalli Hills**
  Any landform located in notified Aravalli districts with a **minimum elevation of 100 metres above local relief**.
- **Aravalli Range**
  A cluster of **two or more Aravalli Hills situated within 500 metres of each other**, thereby forming a continuous ridge system.

🔑 **Significance**:
This prevents selective exclusion of degraded or fragmented hills from environmental protection norms.

2. Core / Inviolate Zone Safeguards

The committee categorically recommended a **complete prohibition on mining activities** in ecologically sensitive zones, including:

- Protected areas and **Eco-Sensitive Zones (ESZs)**
- **Tiger reserves and wildlife corridors**
- Wetlands and water recharge zones
- **CAMPA plantation areas**

🔑 **Rationale**:
Mining in these zones irreversibly damages **aquifers, forest cover, and wildlife habitats**, directly affecting regional climate resilience.

Key Directions Issued by the Supreme Court

1. Management Plan for Sustainable Mining (MPSM)

- Directed preparation of a **comprehensive MPSM** for the **entire Aravalli landscape**
- Responsibility assigned to **Indian Council of Forestry Research and Education**
- Modelled on the **Saranda Forest (Jharkhand)** framework, which balances mineral extraction with ecological thresholds

2. Freeze on New Mining Leases

- **Absolute suspension of new mining leases** in the Aravalli region
- To continue **until a new MPSM is finalised and approved**

🔑 **Governance Significance**:
Reinforces the **Precautionary Principle** and the doctrine of **Intergenerational Equity**, repeatedly upheld by the judiciary.

About the Aravalli Range

- Among the **oldest fold mountain systems in the world** (Pre-Cambrian origin)
- **Older than the Himalayas**, heavily eroded over geological time
- Extends **~800 km** from **Gujarat to Delhi**, passing through **Rajasthan and Haryana**
- **Highest Peak**: *Guru Shikhar* (Mount Abu)

🔑 **Ecological Importance**

- Acts as a **climatic barrier** against desertification from the Thar
- Critical for **groundwater recharge** in north-west India
- Supports unique **dry deciduous and thorn forest ecosystems**

Ongoing and Recent Conservation Initiatives

1. Matri Van Initiative

- Development of a **750-acre urban forest** in the Aravalli region
- Implemented under the **"Ek Ped Maa Ke Naam"** campaign
- Focus on **native species restoration** and urban ecological buffers

2. Aravalli Green Wall Project

- Creation of a **5 km-wide green buffer** around the Aravalli system
- Covers **four states**

- Aims to combat:
  - **Land degradation**
  - **Air pollution**
  - **Eastward expansion of desert conditions**

3. Judicial Interventions

- In **MC Mehta v. Union of India**, a series of landmark rulings:
  - **Banned and restricted mining activities** across large parts of the Aravallis
  - Recognised the range as a **critical ecological asset**, not merely a mineral zone

Broader Significance

Dimension	Relevance
Environmental Governance	Strengthens judicial oversight and science-based policymaking
Federalism	Harmonises definitions across states, reducing regulatory arbitrage
Climate Change	Enhances resilience against desertification and heat stress
Sustainable Development	Balances economic activity with ecological thresholds

Conclusion

The Supreme Court's acceptance of a **uniform, scientific definition of the Aravalli landscape** marks a decisive move towards **ecosystem-based governance**. By integrating **judicial activism, expert knowledge, and sustainability principles**, the ruling reinforces India's commitment to **environmental protection, intergenerational equity, and climate resilience**. Effective implementation and inter-state coordination will be critical to translating this legal clarity into **on-ground ecological recovery**.

Mains Practice Question

"The Supreme Court's recent acceptance of a uniform definition of the Aravalli range signifies a shift towards landscape-level environmental governance. Analyse the ecological and governance implications of this approach."

SCIENCE & TECHNOLOGY

LVM3-M6 Mission and India's Space Capability

📌 Syllabus Mapping

- **GS Paper III** – Science & Technology: Space Technology, Indigenisation, Commercialisation of Space
- **GS Paper II** – Governance: Role of Government Agencies, International Collaboration

Introduction (Contextual Background)

The **Indian Space Research Organisation (ISRO)** successfully executed the **LVM3-M6 mission**, placing the **BlueBird Block-2 satellite** into **Low Earth Orbit (LEO)**. This mission marks the **sixth operational flight of LVM3** and the **third dedicated commercial mission** for a foreign customer, underscoring India's growing stature as a **reliable heavy-lift launch service provider** in the global space economy.

Mission Overview: LVM3-M6

- **Launch Site**: **Satish Dhawan Space Centre**
- **Nature of Mission**: Dedicated commercial launch
- **Customer**: **AST SpaceMobile**
- **Commercial Interface**: **NewSpace India Limited (NSIL)**, a wholly owned Government of India company under the Department of Space (incorporated in 2019)

🔑 **Strategic Significance**:
Reinforces **NSIL's role** in monetising India's space assets and deepening **public-sector–led commercialisation**.

About BlueBird Block-2 Satellite

Role & Orbit

- Part of a **global LEO constellation** providing **direct-to-mobile satellite connectivity**
- Enables **4G/5G voice & video calls, messaging, streaming, and data** directly to standard mobile devices

Low Earth Orbit (LEO)

- Altitude range: **~160–1,000 km**
- Advantages:
  - **Low latency**
  - High data throughput
  - Ideal for Earth observation and communications
- Hosts the **International Space Station**

Technical Highlights

- **223 m² phased-array antenna** — the **largest commercial communications satellite** deployed in LEO
- **Payload Mass**: **6,100 kg**
  - **Heaviest payload ever launched by LVM3**

🔑 **Technology Edge**:
Phased-array architecture allows **beam steering and high-capacity links**, crucial for seamless mobile connectivity.

ISRO's LVM3 (Gaganyaan-Class) Launch Vehicle

Configuration

- **Three-stage architecture**:
  1. **S200** – Two solid strap-on boosters
  2. **L110** – Liquid core stage
  3. **C25** – Cryogenic upper stage

Performance Parameters

- **Lift-off Mass**: **~640 tonnes**
- **Payload Capability**:
  - **~4,200 kg to GTO (Geosynchronous Transfer Orbit)**

GTO: An elliptical orbit (~37,000 km apogee) used to transfer spacecraft to **geosynchronous/geostationary orbits**.

Proven Flight Heritage

- **Chandrayaan-2**
- **Chandrayaan-3**
- **Two OneWeb missions** (72 satellites)

🔑 **Reliability Marker**:
Repeated success across science, human-rated development, and commercial missions enhances **global customer confidence**.

Why LVM3-M6 Matters

Dimension	Significance
Science & Tech	Demonstrates heavy-lift precision to LEO
Commercial Space	Strengthens India's launch market share
Digital Connectivity	Supports next-gen satellite-to-mobile services
Strategic Autonomy	Reduces dependence on foreign launchers
Economy	Expands space-based services and revenues

Conclusion

The **LVM3-M6 mission** is a landmark in India's space journey—showcasing **heavy-lift capability, mission reliability, and commercial readiness**. By deploying the **BlueBird Block-2**—the heaviest LEO payload launched by LVM3—India reinforces its position as a **trusted global launch partner** while enabling transformative **direct-to-mobile satellite connectivity**. As NSIL scales commercial engagements, such missions will be pivotal to India's ambition of becoming a **leading spacefaring and space-services nation**.

Mains Practice Question

"The successful LVM3-M6 mission reflects India's growing prowess in heavy-lift launch vehicles and commercial space services. Analyse the technological and strategic significance of this mission for India's space sector."