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Foreword

Officers Pulse-In Depth provides detailed analyses of significant articles from a variety of sources including **The Hindu, Indian Express, Business Standard, Yojana, Kurukshetra, Down to Earth, and others.** These insights are extremely valuable for UPSC CSE Mains preparation. To ensure comprehensive preparation for both Prelims & Mains, we recommend studying Officers Pulse-In depth along with Officers Pulse-Digest.

Note: The keywords provided in the blue box below are crucial for Mains. They highlight essential themes and terminologies that can enhance the quality of answers.

Sample:

KEY WORDS

- **Monetary Policy Committee (MPC)** – Six-member RBI body deciding repo-rate to maintain inflation target ($4 \pm 2\%$).
- **Core Inflation** – Inflation rate excluding food and fuel, showing underlying price trends.
- **Headline Inflation** – Overall inflation measured by Consumer Price Index (CPI).
- **Tolerance Band** – Permissible inflation range around RBI's target for policy flexibility.
- **Section 45ZN, RBI Act 1934** – Mandates RBI to explain causes and remedies if inflation exceeds target for three quarters.
- **Fiscal-Monetary Coordination** – Synchronization of government spending and RBI policy for macro stability.
- **Financial Inclusion** – Ensuring affordable access to financial services for all sections, esp. vulnerable groups.

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INDIA'S DEMOGRAPHIC DIVIDEND: OPPORTUNITIES AND CHALLENGES

GS Paper I – Indian Society

Background

India is currently undergoing a remarkable demographic transformation characterized by a young population and a low dependency ratio. With a median age hovering around **29 years**, the nation possesses a unique window of economic advantage. This structural shift positions India as a vital engine for future global growth and innovation.

What is the Demographic Dividend?

A demographic dividend is the accelerated economic growth potential that occurs when a country's **working-age population** (15–64 years) outnumbers its dependent population (children and the elderly). This favorable age distribution reduces household and societal burdens, creating crucial fiscal space for savings and capital investments. Capitalizing on this transition allows nations to dramatically expand labor productivity and elevate overall living standards.

Key Opportunities

- **Labor Force Expansion:** A massive surge in the active working-age bracket supplies ample manpower to fuel domestic industrialization and global tech sectors.
 - **Ex:** India's workforce is projected to approach **1 billion** citizens by 2047, positioning the country as an indispensable global talent supplier.
- **Digital Innovation Ecosystem:** A tech-savvy younger demographic heavily drives rapid advancements in fintech, mobile commerce, and automation technologies.
 - **Ex:** The widespread hyper-adoption of platforms like **UPI** processes billions of digital transactions monthly, fueling economic inclusion.
- **Expansion of Consumer Markets:** Steady wage earnings among young urban adults stimulate high consumer demand across housing, automobiles, and retail.
 - **Ex:** Growing middle-class aspirations have made India one of the fastest-growing **smartphone and automotive** markets worldwide.
- **Global Labor Arbitrage:** An abundant surplus of skilled professionals helps offset severe workforce contractions happening in aging Western and East Asian nations.
 - **Ex:** Indian IT, engineering, and healthcare professionals lead high-value remote and onsite roles for **multinational corporations** globally.
- **Enhanced Domestic Savings:** A lower dependency burden frees up extra disposable household income that flows directly into capital markets and entrepreneurial startups.
 - **Ex:** The massive proliferation of local retail investment through **mutual funds and SIPs** has catalyzed indigenous market liquidity.

Key Challenges

- **Structural Unemployment:** Failure to generate adequate formal job opportunities matching the massive influx of young job seekers can trigger widespread economic frustration.
 - **Ex:** High numbers of applicants for limited government or corporate positions frequently highlight intense **job scarcity** in specific sectors.
- **Skills Mismatch:** Outdated educational frameworks often leave graduates lacking the critical, dynamic technical and digital competencies demanded by modern industries.

- **Ex:** Surveys consistently show that a significant percentage of engineering graduates require **intensive upskilling** before deployment on corporate projects.
- **Low Female Workforce Participation:** Systemic socio-cultural barriers and safety concerns chronically sideline women, undermining total national economic output.
 - **Ex:** India's **Female Labor Force Participation Rate (FLFPR)** has historically lagged behind global averages, though recent upward adjustments are occurring.
- **Nutritional and Health Deficits:** Persistent gaps in early childhood nutrition and public healthcare impair long-term cognitive capabilities and individual labor output.
 - **Ex:** High regional rates of childhood **stunting and anemia** continue to restrict the future physical and mental productivity of the workforce.
- **Infrastructure Strain:** Rapid, unplanned urban migration heavily overloads city housing, public transportation, and sanitation amenities, creating widespread bottlenecks.
 - **Ex:** Expanding **urban slums and severe traffic gridlocks** in major metropolitan hubs reveal deep structural planning deficits.

Way Forward

- **Massive Skilling Alignment:** Upgrade technical education and vocational training to match rapid digital and AI-driven industry demands.
 - **Ex:** Expanding **Pradhan Mantri Kaushal Vikas Yojana (PMKVY)** to train millions of youth in emerging technologies.
- **Robust Job Generation:** Scale up labor-intensive manufacturing sectors and ease regulatory compliance to expand formal employment opportunities.
 - **Ex:** Utilizing **Production-Linked Incentive (PLI)** schemes to turn India into a global manufacturing hub.
- **Women Workforce Integration:** Enforce gender-inclusive policies, improve public safety, and expand childcare support to drive female economic participation.
 - **Ex:** Providing flexible work structures and **maternity benefits** to steadily elevate the Female Labor Force Participation Rate.
- **Preventive Healthcare Upgrades:** Strengthen public health delivery systems and eliminate early childhood malnutrition to secure long-term physical productivity.
 - **Ex:** Scaling up national programs like **Ayushman Bharat** to ensure affordable, universal healthcare access.
- **Sustainable Urban Planning:** Build resilient, modern urban infrastructure and smart housing to manage rapid migration and prevent economic bottlenecks.
 - **Ex:** Implementing the **Smart Cities Mission** to develop efficient, inclusive, and technologically advanced metropolitan centers.

India's **demographic dividend** offers a historic yet **time-bound window** to achieve sustained **economic transformation** and global leadership. Capitalizing on this advantage demands urgent, concerted investments in **human capital, high-quality education, and massive job creation**. Ultimately, proactive policy execution today will determine whether this vast young population drives **permanent prosperity** or results in missed opportunities.

KEYWORDS

1. **Working-Age Population** – Large share of the population in the economically productive age group.
2. **Human Capital Formation** – Investment in education, health and skills to enhance workforce productivity.
3. **Employment Generation** – Creation of adequate and quality jobs to absorb the growing workforce.
4. **Female Labour Force Participation** – Greater participation of women in economic activity to fully utilise the demographic potential.
5. **Skill-Job Alignment** – Bridging the gap between workforce skills and the requirements of emerging industries.

UPSC PYQ

"Demographic Dividend in India will remain only theoretical unless our manpower becomes more educated, aware, skilled and creative." (2016)

Critically examine the challenges of demographic transition in contemporary India. (2026)

ROLE OF WOMEN IN NATION-BUILDING: FROM WELFARE TO WOMEN-LED DEVELOPMENT

("GS-I: Indian Society – Women's Empowerment, Gender Equality, Women's Role in Nation-Building & Social Change. GS-II: Governance – Women-Centric Schemes, Political Representation, SHGs & Women-Led Development.)"

Introduction

Women have been active contributors to India's nation-building journey—from Kasturba Gandhi and Sarojini Naidu in the freedom struggle to millions of women shaping governance, livelihoods and entrepreneurship today.

Female Labour Force Participation Rate rose from 23.3% in 2017-18 to 40% in 2025, while nearly 100 million women are organised into over 9 million SHGs. Thus, India's approach is increasingly moving from "development for women" to "women-led development", where women are not merely beneficiaries but agents of growth and social transformation.

Economic and Social Transformation

- **Expands the productive workforce:** Greater participation of women enlarges the effective labour pool and enables India to utilise its demographic potential.
 - **Ex:** Female LFPR rose from **23.3% in 2017-18 to around 40% in 2025**, reflecting increasing economic participation.
- **Strengthens entrepreneurship:** Women-led enterprises diversify household incomes, generate employment and deepen grassroots economic activity.
 - **Ex:** Around **two-thirds of PM MUDRA loans** have been sanctioned to women entrepreneurs.
- **Transforms rural livelihoods:** Women's SHGs have evolved from savings-and-credit groups into platforms for enterprise, skills and collective economic action.
 - **Ex:** DAY-NRLM has mobilised **10.05 crore rural households into 90.90 lakh SHGs**, creating a large women-led rural economic network.
- **Creates intergenerational gains:** Women's education, health and economic independence improve household welfare and human-capital outcomes.
 - **Ex:** Investments in **girl-child education, nutrition, healthcare and livelihoods** create benefits extending across generations.

Leadership and Governance

- **Deepens grassroots democracy:** Women's participation brings diverse perspectives and community priorities into local decision-making.
 - **Ex:** Around **14.5 lakh women are elected representatives in Panchayati Raj Institutions**, constituting nearly **46%** of all representatives.
- **Expands leadership beyond traditional sectors:** Women are increasingly entering defence, technology, public institutions and other previously male-dominated domains.
 - **Ex:** In 2025, the **first batch of 17 women cadets graduated from the National Defence Academy**, marking an expansion of women's participation in the armed forces.
- **Strengthens political representation:** Constitutional measures seek to convert grassroots participation into greater representation in higher legislatures.

- **Ex:** The **Nari Shakti Vandan Adhiniyam, 2023** provides for **33% reservation for women in the Lok Sabha and State Legislative Assemblies** after the prescribed delimitation process.

Innovation and Nation-Building

- **Enables participation in emerging technologies:** Women are increasingly becoming users, skilled operators and entrepreneurs in technology-driven sectors.
 - **Ex: NaMo Drone Didi** promotes drone-based agricultural services through women SHGs.
- **Bridges the digital and financial divide:** Digital platforms can connect women with credit, markets, government services and entrepreneurship.
 - **Ex:** Women-led enterprises have increasingly accessed government procurement opportunities through initiatives such as **GeM's Womaniya**.
- **Builds community resilience:** Women's collective institutions create networks capable of supporting livelihoods, social awareness and local development.
 - **Ex:** The network of **over 90 lakh SHGs under DAY-NRLM** provides a large institutional base for grassroots mobilisation.

From Welfare to Women-Led Development

- **Welfare → Capability:** The focus is shifting from meeting basic needs to building women's capabilities through education, skills, health and livelihoods.
 - **Ex: Mission Shakti** combines safety and empowerment, while SHG programmes create pathways towards livelihoods and enterprise.
- **Beneficiary → Economic Agent:** Women are increasingly viewed as producers, entrepreneurs, farmers and workers rather than merely recipients of welfare.
 - **Ex:** DAY-NRLM has enabled millions of rural women to move towards **organised livelihoods and enterprises**.
- **Participation → Leadership:** The emphasis is moving from merely including women in institutions to enabling them to influence decisions and lead them.
 - **Ex: 14.5 lakh women PRI representatives** demonstrate the scale of women's grassroots leadership.

Challenges

- **Low and unequal economic participation:** Social norms, unpaid care work and occupational segregation continue to constrain women's workforce participation.
- **Gender gaps in leadership:** Numerical representation does not always translate into substantive decision-making power.
 - **Ex:** proxy representation in local bodies.
- **Digital and skill divide:** Unequal access to technology, quality education, skilling and digital finance limits participation in emerging sectors.
- **Structural barriers and safety concerns:** Gender-based violence, mobility constraints, workplace discrimination and inadequate care infrastructure restrict women's ability to participate fully.

Way Forward

- **Build a care-supportive economy:** Expand childcare, safe transport, sanitation and flexible work arrangements to reduce the unpaid-care burden on women.

- **Link skilling with emerging opportunities:** Align women's skilling with sectors such as **AI, electronics, green energy, healthcare, drones and advanced manufacturing**, rather than limiting training to traditional occupations.
- **Deepen women's access to capital and markets:** Move beyond credit availability towards enterprise mentoring, digital finance, procurement access, branding and market linkages.
 - **Ex:** Strengthening the SHG ecosystem can help women graduate from **micro-credit to sustainable enterprises and value chains**.
- **Convert representation into substantive leadership:** Strengthen capacity-building, digital literacy, legal awareness and institutional support for women elected representatives.
 - **Ex:** Initiatives such as **Sashakt Panchayat-Netri Abhiyan** focus on strengthening the leadership capacities of women representatives.

Conclusion

Women-led development transforms women from recipients of development into co-creators of development. India's transition from welfare-oriented interventions towards economic agency, leadership and decision-making can make women central to the realisation of Viksit Bharat 2047.

KEY WORDS

LFPR (Labour Force Participation Rate): Proportion of the working-age population that is either employed or actively seeking employment.

- **PM MUDRA Yojana:** Provides collateral-free institutional credit to micro and small enterprises, with a strong focus on expanding women's entrepreneurship.
- **Nari Shakti Vandan Adhiniyam, 2023:** Provides 33% reservation for women in the Lok Sabha and State Legislative Assemblies, subject to delimitation and the constitutional process.
- **NaMo Drone Didi:** A scheme to equip and train women SHG members to operate drones for agricultural services, creating new livelihood opportunities.
- **GeM's Womaniya:** An initiative on the Government e-Marketplace (GeM) that facilitates greater participation of women entrepreneurs and women-led enterprises in public procurement.
- **Sashakt Panchayat-Netri Abhiyan:** Aims to strengthen the leadership, capacity and decision-making abilities of women elected representatives in Panchayati Raj Institutions.

UPSC PYQ

Pyq: 2019 – "What are the continued challenges for women in India against time and space?"

FISCAL FEDERALISM IN INDIA

("GS-II: Federalism – Centre–State Financial Relations, Fiscal Devolution, Finance Commission, GST & Local Government Finances.")

Introduction

Fiscal federalism refers to the distribution of financial resources and responsibilities among different levels of government. In India, it is anchored in **Articles 270 and 280**, with the Finance Commission recommending the distribution of Union tax revenues and grants to States.

The scale of this fiscal relationship is significant: **total transfers from the Centre to States increased from ₹11.5 lakh crore in FY2020 to ₹25.6 lakh crore in FY2026 (BE)**, rising from 5.7% to 6.9% of GDP. The **16th Finance Commission has recommended retaining States' share at 41% of the divisible pool for 2026–31**, underscoring the central role of fiscal transfers in India's federal structure.

Constitutional framework of Fiscal Federalism

- **Division of taxation powers:** The Seventh Schedule distributes legislative and taxation powers between the Union and States, providing the constitutional foundation for fiscal federalism.
 - **Ex: Article 246** read with the Seventh Schedule allocates subjects between the Union, State and Concurrent Lists.
- **Tax devolution:** A portion of the Union's divisible tax pool is devolved to States on the recommendations of the Finance Commission.
 - **Ex: The 16th Finance Commission retained States' share at 41% of the divisible pool for 2026–31.**
- **Grants-in-aid:** The Constitution provides transfers to States to address differences in fiscal capacity and expenditure needs.
 - **Ex: Article 275** provides for grants-in-aid to States from the Consolidated Fund of India.
- **GST-based cooperative federalism:** GST created a shared tax framework in which the Union and States participate in tax policy through the GST Council.
 - **Ex: The 101st Constitutional Amendment** and the GST Council institutionalised joint decision-making on indirect taxation.
- **Borrowing arrangements:** Fiscal federalism also encompasses borrowing powers and constraints of different levels of government.
 - **Ex: Under Article 293**, States may borrow within India, while certain circumstances require Union consent for further borrowing.

Significance of Fiscal Federalism

- **Enhances State-level development:** Greater availability of untied resources allows States to design expenditure according to their specific developmental priorities.
 - **Ex: Higher tax devolution following the 14th Finance Commission's increase from 32% to 42%** strengthened the resource base available to States.
- **Addresses asymmetric capacities:** Transfers compensate for differences in geographical, demographic and economic circumstances among States.
 - **Ex: Special consideration for hill States, North-Eastern States and island territories** recognises their distinctive fiscal and geographical constraints.

Major challenges

- **Vertical fiscal imbalance:** States have substantial expenditure responsibilities in sectors such as health, education, agriculture and rural development, while major buoyant tax bases remain concentrated with the Union.
 - **Ex:** Post-GST, States lost independent taxation powers over several major indirect taxes, increasing their dependence on transfers.
- **Cesses and surcharges reduce the divisible pool:** Since many cesses and surcharges are outside the divisible pool, their increasing use can reduce the effective resources available for tax devolution.
- **Conditionality of Centrally Sponsored Schemes:** Tied transfers can constrain States' ability to determine expenditure according to local priorities.
 - **Ex:** States contributing matching funds to **Centrally Sponsored Schemes** may have less fiscal space for alternative State-specific priorities.
- **Borrowing constraints:** Limits on State borrowing can create tensions between fiscal discipline and States' need to finance development and respond to fiscal shocks.
 - **Ex:** The **Kerala–Union dispute over borrowing limits** illustrates the tension between State fiscal autonomy and macroeconomic fiscal discipline.
- **Inter-State fiscal disparities:** Differences in economic capacity mean that States vary considerably in their ability to raise own revenues and finance public services.
 - **Ex:** Finance Commission's use of **income distance** attempts to channel relatively greater resources towards States with lower fiscal capacity.
- **Erosion of State taxation autonomy under GST:** States surrendered several independent indirect-tax powers in return for a harmonised national market.
 - **Ex:** State VAT and several other indirect taxes were subsumed into GST, reducing States' unilateral flexibility over these taxes.
- **Third-tier fiscal weakness:** Genuine fiscal federalism remains incomplete when Panchayats and Urban Local Bodies lack adequate own-source revenues and predictable transfers.
 - **Ex:** Strengthening **State Finance Commissions** is important for ensuring regular financial transfers to local governments.

Recent developments and emerging debate

- **16th Finance Commission:** The Commission has retained **41% vertical devolution**, while its horizontal framework seeks to balance equity with incentives for economic performance.
 - **Ex:** Its criteria include **income distance, population, demographic performance, area, forest and ecology, and contribution to GSDP**.
- **Balancing equity with efficiency:** Fiscal transfers increasingly face the challenge of rewarding States for economic performance without disadvantaging States with lower fiscal capacity.
 - **Ex:** Inclusion of **GSDP contribution** alongside income distance in the 16th Finance Commission's framework reflects this balancing approach.
- **Centre–State fiscal disputes:** Disagreements over borrowing limits, disaster assistance and resource sharing demonstrate that fiscal federalism is also an important dimension of Centre–State relations.
 - **Ex:** **Tamil Nadu, Kerala and Karnataka** have raised different fiscal-resource concerns involving disaster relief, borrowing ceilings and drought assistance.

Strengthening Fiscal Federalism

- **Rationalise cesses and surcharges:** Greater transparency and restraint in non-devolvable levies can enlarge the effective divisible pool available to States.
 - **Ex:** Bringing a greater proportion of such revenues within a predictable sharing framework would strengthen the role of Finance Commission transfers.
- **Increase flexibility in CSS:** Centrally Sponsored Schemes should focus on genuinely national priorities while giving States greater flexibility in implementation and expenditure.
 - **Ex:** Core areas such as **primary healthcare, basic education and rural employment** can retain national support while allowing State-specific implementation.
- **Strengthen GST cooperative mechanisms:** Greater consultation and predictable compensation/transition mechanisms can improve States' confidence in the GST framework.
 - **Ex:** The **GST Council** can continue to serve as the institutional forum for resolving Centre-State tax concerns.

Conclusion

Fiscal federalism is not merely about transferring money; it is about creating a fair balance between fiscal autonomy, equity and accountability. A stronger system of predictable devolution, cooperative GST governance, responsible borrowing and empowered local governments can deepen India's **cooperative and competitive federalism**.

KEY WORDS

Vertical Fiscal Imbalance: Mismatch between the revenue-raising capacity of a government and its expenditure responsibilities.

- **Horizontal Fiscal Imbalance:** Differences in fiscal capacity and expenditure needs among different States.
- **Tax Devolution:** Distribution of the Union's divisible tax pool among the Union and States based on Finance Commission recommendations.
- **Divisible Pool:** The portion of Union taxes that is shareable with States, excluding specified cesses and surcharges.
- **Finance Commission:** Constitutional body under **Article 280** that recommends tax devolution and grants-in-aid between the Union and States.
- **GST Council:** Constitutional body under **Article 279A** that provides a joint platform for Union and States to decide GST-related matters.
- **Cesses & Surcharges:** Levies imposed by the Union whose proceeds are generally **not part of the divisible pool** for tax devolution.
- **Centrally Sponsored Schemes (CSS):** Schemes jointly funded by the Centre and States, with the Centre

UPSC PYQ

Examine the evolving pattern of Centre-State financial relations in the context of planned development in India. How far have the recent reforms impacted the fiscal federalism in India?" — UPSC CSE Mains 2025,

POLICE AND CRIMINAL JUSTICE REFORMS IN INDIA

GS-II: Governance, Constitution, Polity, Social Justice and International Relations

Background

India's criminal justice system remains plagued by British colonial legacies, including political interference, understaffing, and massive backlogs. Although landmark rulings like *Prakash Singh (2006)* urged structural autonomy, the legal landscape was officially modernized with the rollout of new criminal codes (*BNS, BNSS, BSA*) in July 2024 to replace outdated laws.

Structural Bottlenecks in the Police System

- **Colonial Framework:** Policing is still largely governed by the **Police Act of 1861**, which was enacted post-1857 to exert imperial control rather than function as a citizen-centric democratic service.
 - **Ex:** The primary mandate focuses heavily on public order and state security rather than community service and grievance redressal.
- **Political Interference:** Lack of structural autonomy leaves the force vulnerable to executive pressure, selective law enforcement, and arbitrary transfers.
 - **Ex:** Frequent transfers of Superintendent of Police (SPs) or Station House Officers (SHOs) disrupt long-term crime-fighting strategies and demoralize upright officers.
- **Overburdened Force:** Severe under-staffing leads to high-stress work environments, long shifts, and compromised operational efficiency.
 - **Ex:** India's police-to-population ratio frequently falls well below the United Nations-recommended benchmark of roughly 222 personnel per 100,000 citizens.
- **Lack of Functional Specialization:** Officers are simultaneously assigned to routine law-and-order duties, VIP security, and complex criminal investigations.
 - **Ex:** An investigative officer pulled away to manage a political protest or religious procession cannot effectively secure forensic evidence at a crime scene.
- **Deficient Infrastructure:** Outdated investigative tools, poor forensic laboratory capacity, and low digital literacy hamper effective evidence gathering.
 - **Ex:** Forensic backlogs often cause months of delay in receiving crucial DNA or ballistic reports during trial phases.

Landmark Judgments and Institutional Roadmaps

- **Prakash Singh v. Union of India (2006):** The Supreme Court issued seven binding directives to insulate policing from political executive control.
 - **Ex:** Mandating a fixed minimum tenure of two years for the Director General of Police (DGP) and field officers to ensure operational stability.
- **State Security Commissions (SSC):** Proposed to formulate broad policy guidelines and prevent state governments from exercising arbitrary operational control.
 - **Ex:** SSCs function as a buffer between political executives and the state police leadership.
- **Separation of Investigation and Law & Order:** Recommended by multiple commissions to create dedicated wings within police stations.
 - **Ex:** Decoupling investigation units ensures that day-to-day crowd control does not derail long-term criminal investigations
- **Police Establishment Boards (PEB):** Institutional mechanisms to handle postings, transfers, and service matters of mid-to-lower-level officers independently of political influence.

- **Ex:** PEBs protect junior officers from arbitrary political pressure during routine assignments.
- **Police Complaints Authorities (PCA):** Independent bodies established at state and district levels to investigate public grievances against police misconduct.
 - **Ex:** PCAs provide a transparent avenue for citizens to file complaints regarding custodial violence or illegal detention without fearing local police retaliation.

Recent Legislative Overhauls (The New Criminal Codes)

- **Bharatiya Nyaya Sanhita (BNS), 2023:** Replaced the colonial Indian Penal Code (IPC) with updated definitions and modern penal measures.
 - **Ex:** The introduction of community service as a formal sentencing alternative for minor, non-violent offenses to reduce prison overcrowding.
- **Bharatiya Nagarik Suraksha Sanhita (BNSS), 2023:** Replaced the CrPC to fast-track investigations, trials, and judicial administration.
 - **Ex:** Mandatory timelines are prescribed for filing charge sheets, completing trials, and delivering judgments to minimize chronic judicial delays.
- **Mandatory Forensics in Serious Crimes:** BNSS mandates forensic investigation for offenses carrying punishments of 7 years or more.
 - **Ex:** Forensic experts are legally required to visit crime scenes and collect digital/physical evidence for heinous crimes.
- **Bharatiya Sakshya Adhiniyam (BSA), 2023:** Replaced the Indian Evidence Act to integrate modern technological advancements into judicial proceedings.
 - **Ex:** Electronic and digital records (such as emails, server logs, location data, and video recordings) are granted primary legal standing and admissibility.
- **Technological Integration (CCTNS and NAFIS):** Digitization of police stations and nationwide database networking.
 - **Ex:** Law enforcement agencies can cross-match fingerprints and track inter-state criminal movements instantly via centralized national portals.

Critical Challenges in the Criminal Justice Pipeline

- **Judicial Backlogs and Undertrial Population:** Chronic delays in courts result in a massive proportion of prisoners awaiting trial.
 - **Ex:** Over 70% of inmates in Indian correctional facilities comprise undertrials who have not yet been convicted of a crime.
- **Custodial Violence and Human Rights Violations:** Instances of torture, illegal detentions, and custodial deaths remain a critical blot on the system.
 - **Ex:** Lack of mandatory, functional CCTV coverage with audio recording in all police interrogation rooms impedes accountability.
- **Outdated Prison Infrastructure:** Overcrowding, poor sanitation, and lack of rehabilitation infrastructure contradict the reformatory purpose of corrections.
 - **Ex:** Many district jails operate at well over 150% of their designed maximum capacity, mixing petty offenders with hardened criminals.
- **Low Conviction Rates in Complex Cases:** Flawed investigation methodologies and hostile witnesses often cause trials to collapse.
 - **Ex:** Inadequate protection for witnesses leads to high hostility rates during cross-examinations in high-profile criminal trials.

- **Access to Justice for Marginalized Groups:** Socio-economic barriers prevent vulnerable populations from accessing quality legal aid and swift redressal.
 - **Ex:** Impoverished defendants often rely heavily on overburdened public legal defense systems, affecting the quality of their defense.

Way Forward and Reforms for the Future

- **Institutionalizing Structural Police Reforms:** States must fully and genuinely implement the Supreme Court's *Prakash Singh* guidelines rather than adopting watered-down versions.
 - **Ex:** Ensuring strict compliance with transparent, merit-based DGP selection panels overseen by the Union Public Service Commission (UPSC).
- **Strengthening Forensic and Tech Capacities:** Scaling up the number of state forensic science laboratories (FSLs) and training investigating officers in digital evidence management.
 - **Ex:** Establishing mobile forensic vans equipped with rapid DNA and cyber-forensic tools in every police district.
- **Prison Decongestion and Reformatory Justice:** Shifting the correctional philosophy from punitive detention to rehabilitation and mental health support.
 - **Ex:** Expanding the use of plea bargaining, fast-track courts for petty offenses, and regular bail review committees.
- **Legal Aid and Witness Protection Enhancement:** Professionalizing the legal aid system and enforcing statutory witness protection protocols.
 - **Ex:** Institutionalizing independent witness protection cells shielded from local investigative pressures.
- **Comprehensive Sensitization and Training:** Imparting regular training on human rights, constitutional values, and soft skills to ground-level police personnel.
 - **Ex:** Incorporating mandatory modules on psychological stress management, empathy, and gender-sensitive interrogation techniques in police academies.

A robust democracy cannot rely on a colonial-era security apparatus that stifles basic civil liberties and community trust. While enacting modern criminal codes represents a progressive leap, true transformation requires insulating policing from political executive interference. Only through a synchronized overhaul of investigations, forensic upgrades, and prison management can India build a responsive criminal justice system.

KEYWORDS

1. **Police Autonomy** – Insulation from political interference and arbitrary transfers.
2. **Prakash Singh Guidelines** – Institutional framework for police accountability and functional autonomy.
3. **Separation of Investigation & Law and Order** – Specialisation for efficient and professional investigation.
4. **Forensic-led Investigation** – Greater use of scientific and digital evidence under the new criminal laws.
5. **Access to Justice** – Timely, affordable and equitable justice through legal aid, witness protection and judicial reforms.

INDIA - CENTRAL ASIA RELATIONS

GS-II Bilateral, Regional and Global Groupings and Agreements involving India and/or affecting India's interests.

PM Modi visited **Uzbekistan** and attended the **SCO Summit** in **Bishkek, Kyrgyzstan**, highlighting India's growing engagement with **Central Asia**. India and Central Asia share deep-rooted **civilizational and Silk Route ties**, which transitioned into structured diplomatic relations after the **1991 Soviet dissolution**. To overcome physical access barriers, India introduced its **"Connect Central Asia" policy** in 2012, later institutionalizing ties via the **India-Central Asia Summit**. Today, the region serves as India's **extended neighborhood**, acting as a vital **geopolitical buffer, energy source, and trade gateway** to Eurasia.

India - Central Asia: Areas of Interest

- **Energy and Critical Minerals Security:** Central Asia has major reserves of **uranium, natural gas, oil and rare earth elements (REEs)**, important for India's energy and technology needs.
 - **Ex:** **Kazakhstan** supplies uranium to India, while **TAPI** aims to provide natural gas.
- **Strategic Trade and Transport Connectivity:** Connectivity with Central Asia is important for expanding India's Eurasian trade and **bypassing Pakistan**.
 - **Ex:** **Chabahar Port** and the **INSTC** provide alternative routes to Eurasia.
- **Counter-Terrorism and Regional Security:** Stability in Central Asia is important to tackle **terrorism, extremism and drug trafficking**, particularly from Afghanistan.
 - **Ex:** **KAZIND** with Kazakhstan, **DUSTLIK** with Uzbekistan and cooperation through the **SCO**.
- **Development Partnership and Capacity Building:** India provides **Lines of Credit (LoCs)** and technical assistance for infrastructure, healthcare and education.
 - **Ex:** India extended a **\$1 billion Line of Credit** for regional infrastructure projects.
- **Digital Public Infrastructure (DPI) and IT Synergy:** Central Asia offers opportunities for India's expertise in **FinTech, e-governance and digital services**.
 - **Ex:** India is exploring the expansion of **UPI and Aadhaar-like digital systems** in the region.
- **Soft Power and Cultural Cooperation:** **Sufism, Buddhism, Bollywood and medical education** strengthen people-to-people ties.
 - **Ex:** **Swami Vivekananda Cultural Centres** in Astana and Tashkent promote cultural links.

India - Central Asia: Areas of Conflict

- **Lack of Direct Physical Connectivity:** Pakistan's refusal to provide land access forces India to depend on **longer routes through Iran**.
 - **Ex:** Delays in connecting **Chabahar with Iranian rail networks** limit trade potential.
- **Dominance of China's Economic Footprint:** China's large-scale **BRI investments** give it greater economic influence in Central Asia.
 - **Ex:** China is developing the **China-Kyrgyzstan-Uzbekistan (CKU) railway**.
- **Geopolitical Friction over Russia and Ukraine:** Sanctions on **Russia** affect regional banking, logistics and supply chains.
 - **Ex:** Sanctions can delay **INSTC** transit and financial transactions.
- **Instability and Spillover from Afghanistan:** Afghanistan creates risks of **terrorism, drug trafficking and refugee flows** for Central Asia.

- **Ex:** Drug trafficking across the **Tajik-Afghan border** remains a security concern.
- **Competing Trans-Caspian Corridors:** Central Asian states are increasingly developing the **Middle Corridor**, reducing dependence on routes involving India.
 - **Ex:** Expansion of the **Trans-Caspian International Transport Route (TITR)** connects China with Europe via the Caspian Sea and Türkiye.
- **Slow Implementation of Agreements:** Delays and bureaucratic hurdles affect India's image as a **timely project-delivery partner**.
 - **Ex:** The **TAPI gas pipeline** remains stalled due to security and funding challenges.

Way Forward

- **Seamless Integration of Chabahar with INSTC:** India should strengthen **Chabahar's integration with the INSTC** to improve connectivity with Central Asia.
 - **Ex:** Greater use of the **Ashgabat Agreement** can streamline regional transit and customs.
- **Focus on High-Impact Community Development Projects (HICDPs):** India should prioritise **small, grant-based projects** in health, education and local infrastructure.
 - **Ex:** Hospitals, IT centres and **solar electrification projects** in Central Asian countries.
- **Securing Critical Mineral Supply Chains:** India should develop **joint ventures and exploration partnerships** for critical minerals.
 - **Ex:** **KABIL** can explore partnerships with Central Asian countries for lithium and REEs.
- **Institutionalizing Air Freight Corridors:** Dedicated **air cargo routes** can overcome landlocked geography for high-value and perishable goods.
 - **Ex:** Expanding **India-Central Asia air freight connectivity**.
- **Empowering the India-Central Asia Summit Mechanism:** Stronger institutional mechanisms can improve **project implementation and policy coordination**.
 - **Ex:** A dedicated **Joint Secretariat** can monitor cooperation in trade, defence and culture.

India's relationship with Central Asia is pivotal for achieving its **Eurasian strategic depth, energy security, and regional stability**. By transitioning from traditional diplomacy to **pragmatic economic connectivity, digital public infrastructure delivery, and critical mineral partnerships**, New Delhi can successfully counter regional hurdles. A consistent, outcome-driven approach will solidify India's role as a **reliable and indispensable strategic partner** in Central Asia's evolving multi-polar landscape.

KEY WORDS

- **Ashgabat Agreement** – A multilateral transport agreement that facilitates transit and connectivity between Central Asia, Iran, Oman and other Eurasian regions.
- **TAPI Pipeline** – A proposed **Turkmenistan-Afghanistan-Pakistan-India** gas pipeline aimed at transporting natural gas from Turkmenistan to South Asia.
- **KAZIND** – A joint military exercise between **India and Kazakhstan** focused on counter-terrorism, peacekeeping and military interoperability.
- **DUSTLIK** – A joint military exercise between **India and Uzbekistan** focused on counter-terrorism operations and enhancing military interoperability.

SPORTS GOVERNANCE AND PROMOTION OF SPORTING TALENT IN INDIA

(GS-II: Important Aspects of Governance, Transparency and Accountability; Institutional Mechanisms, Transparency & Accountability in Public Administration, and Statutory Frameworks)

Introduction

Sports in India are transitioning from a **recreational pursuit** to a vital pillar of **national prestige** and **soft power**. Despite individual successes, India's broader potential has long been constrained by **systemic administrative issues**, inadequate infrastructure, and **fragmented athlete management**.

Key Challenges in Sports Governance in India

- **Accountability Deficits in National Sports Federations (NSFs):** NSFs often lack **transparency** and sound governance, leading to recurring controversies and corruption.
 - *Ex: Persistent **administrative deadlocks** in wrestling and gymnastics federations.*
- **Absence of Professional Management:** Administrative bodies rely heavily on **ad-hoc volunteer management** rather than modern corporate practices like financial disclosures and clear **KPIs**.
 - *Ex: Reliance on politicians and bureaucrats rather than **professional sports managers**.*
- **Inadequate Athlete Grievance Mechanisms:** Poor internal redressal systems expose players to **arbitrary selection biases** and **administrative apathy**.
 - *Ex: Prominent wrestlers protesting publicly due to a **lack of internal redressal**.*
- **Cricket-Centric Resource Skewness:** Excessive focus and **corporate funding** for cricket leave Olympic and indigenous sports chronically **underfunded**.
 - *Ex: Stark disparity in corporate sponsorships between the **IPL** and traditional sports.*
- **Regulatory Fragmentation and Institutional Overlap:** Unclear role demarcations between the ministry, **Indian Olympic Association (IOA)**, and state bodies cause persistent coordination failures.
 - *Ex: Instances of international body suspensions due to perceived **third-party interference**.*

Measures for the Promotion of Sporting Talent

- **Grassroots Scouting via Khelo India:** The revamped **Khelo India Scheme** and Talent Search Portal actively identify and nurture young talent nationwide.
 - *Ex: Annual **Khelo India Youth Games** creating an extensive talent pipeline.*
- **Elite Support through TOPS:** The **Target Olympic Podium Scheme (TOPS)** delivers customized training and **financial stipends** for elite medal prospects.
 - *Ex: Direct financial assistance and customized foreign training for Olympic medalists like **Neeraj Chopra**.*
- **Statutory Anti-Doping Framework:** The **National Anti-Doping Act, 2022** established a legal framework to ensure **clean, compliant sports**.
 - *Ex: Empowering NADA with statutory powers for **unannounced out-of-competition testing**.*
- **Curricular Integration via NEP:** The **National Education Policy (NEP)** embeds sports into school curricula to build an **early sporting culture**.
 - *Ex: Treating sports as an **equal subject** alongside core academics in schools.*
- **Statutory Governance Reform:** Enactment of modern structural frameworks like the **National Sports Governance Act** establishes specialized oversight boards and dispute resolution tribunals.

- *Ex:* Temporary bans on Indian sports bodies by global authorities due to government overreach or **unwanted political interference**.

Way Forward

- **Professionalizing Sports Bodies:** NSFs must adopt **modern corporate practices**—including regular **audits**, performance metrics, and professional management.
 - *Ex:* Mandating independent **corporate governance audits** for all registered federations.
- **Mandatory Athlete Representation:** Including former athletes in governing committees will ensure **player-centric decision-making** and ethical compliance.
 - *Ex:* Constitutional quotas for **eminent sportspersons (SOMs)** in voting bodies.
- **Strict Safe Sports Ecosystems: Zero-tolerance policies** and independent grievance cells must be enforced across all federations.
 - *Ex:* Setting up independent ombudsmen for **confidential harassment reporting**.
- **Enhancing Federal Coordination:** Streamlining Centre-State administrative frameworks will ensure uniform implementation of regional grassroots infrastructure projects.
 - *Ex:* Aligning state sports boards with national strategic targets for the **2036 Olympic bid**.
- **Standardizing Coaching Qualifications:** Building institutional capacities through structured certification boards will upgrade training delivery.
 - *Ex:* Establishing the **National Coach Accreditation Board** to monitor coaching standards nationwide.

Conclusion:

Transforming India into a global sports powerhouse requires dismantling **archaic administrative silos** and matching grassroots financial support with **transparent, athlete-first governance**.

KEY WORDS

- **National Sports Federations (NSFs)** - Autonomous bodies designated to manage and develop specific sports disciplines across India.
- **Khelo India Scheme** - A flagship national program aimed at reviving grassroots sports culture and identifying young talent.
- **Target Olympic Podium Scheme (TOPS)** - India's premier initiative providing customized high-performance training and financial support to elite athletes.
- **National Anti-Doping Act, 2022** - A legislative enactment providing statutory backing to NADA to maintain clean, drug-free sports.
- **Modern Corporate Practices** - The adoption of private-sector standards like transparency, financial disclosures, and professional management in sports bodies.

TEN YEARS OF UPI

(GS-II: Important Aspects of Governance, Transparency and Accountability; E-governance - Applications, Models, Successes, Limitations, and Potential)

Introduction

Launched in 2016 by the National Payments Corporation of India (NPCI), the **Unified Payments Interface (UPI)** has completed a remarkable decade of operations. Evolving from a modest pilot project into the world's largest real-time payment system, UPI has fundamentally rewritten India's financial narrative, serving as a crown jewel of the nation's **Digital Public Infrastructure (DPI)**.

Transformational Impact over a Decade

- **Explosive Scale and Volume:** Annual transaction volumes have grown exponentially—surging from 1.78 crore in FY 2016-17 to over 24,162 crore transactions.
 - *Ex: Processing billions of monthly transactions that surpass global **card network volumes**.*
- **Deepening Financial Inclusion:** By bridging the digital divide, UPI brought unbanked populations into the formal economy, registering massive adoption for micro-transactions.
 - *Ex: Street vendors across tier-3 cities accepting instant digital payments via **QR codes**.*
- **Interoperable Open Architecture:** Unlike closed-loop wallets, UPI's peer-to-peer (P2P) and peer-to-merchant (P2M) frameworks allow instant fund transfers across diverse apps using **virtual payment addresses (VPAs)**.
 - *Ex: Sending money directly from a Google Pay account to a PhonePe user using a simple handle.*
- **Cost Reduction and Formalization:** It has drastically reduced cash-handling overheads for businesses while expanding the tax base through **digital trail visibility**.
 - *Ex: Micro-enterprises saving heavily on physical cash management and transportation costs.*
- **Catalyzing Credit and Lending Expansion:** Routine transaction trails have empowered financial institutions to introduce instant, data-driven **digital credit lines**.
 - *Ex: Unsecured micro-loans disbursed instantly to small vendors based solely on **UPI transaction metrics**.*

Key Challenges Encountered

- **Technological Infrastructure Stress:** High daily transaction spikes occasionally test server capacities, resulting in intermittent technical declines or **transaction time-outs**.
 - *Ex: Server slowdowns observed during peak festive seasons like Diwali.*
- **Cybersecurity and Fraud Risks:** Rising instances of phishing and unauthorized transactions necessitate constant upgrades in proactive **fraud-detection mechanisms**.
 - *Ex: Proliferation of fraudulent social engineering calls and **fake QR code scams**.*
- **Monetization Dilemma:** The strict zero-merchant discount rate (MDR) policy aided widespread adoption but placed severe financial strain on **payment service providers (PSPs)**.
 - *Ex: Addressing banking sector operational losses through **revised regulatory frameworks**.*
- **Vulnerability of Digitally Illiterate Users:** Rapid scale expansion has exposed vulnerable or first-time digital consumers to sophisticated remote-access scams.
 - *Ex: Rural or elderly users falling prey to fraudulent customer care helpline numbers.*
- **Merchant Settlement Disputes:** Escalating transaction volumes occasionally increase stuck merchant refunds, creating friction in automated **reconciliation workflows**.
 - *Ex: Delayed reversals for failed P2M transactions during high-density retail hours.*

Global Footprint and the Way Forward

- **Internationalization:** UPI has expanded its cross-border footprint to multiple nations, emerging as a global benchmark for **sovereign digital rails**.
 - *Ex: Enabling Indian tourists to make UPI payments at the Eiffel Tower in Paris.*
- **Next-Gen Innovations:** Integrating artificial intelligence and offline payment features (**UPI Lite/X**) will drive the next wave of inclusion.
 - *Ex: Using UPI Lite for seamless pocket-money micro-payments without internet connectivity.*
- **Recent MDR Policy Adjustments:** Transitioning towards a sustainable ecosystem, a calibrated **Merchant Discount Rate (MDR)** framework introduces nominal charges on larger P2M brackets while keeping small merchants free.
 - *Ex: Protecting small vendors while funding institutional **cybersecurity upgrades**.*
- **Ensuring Data Privacy and Security:** Implementing robust, decentralized data protection protocols will safeguard user trust against evolving **cyber threats**.
 - *Ex: Enforcing strict RBI guidelines on **tokenization** and risk-based transaction monitoring.*
- **Cross-Border Remittance Optimization:** Deepening multilateral agreements will drastically reduce foreign exchange friction for global remittances.
 - *Ex: Integrating UPI directly with foreign real-time systems for instant worker remittances.*

Conclusion

As UPI enters its second decade, it stands as a testament to indigenous technological innovation. Moving forward, balancing robust cybersecurity frameworks with sustainable economic models like the revised MDR policy will ensure UPI continues to drive India's vision of a **\$5 trillion digital economy**.

KEY WORDS

- **National Payments Corporation of India (NPCI):** An umbrella organization for operating retail payments and settlement systems in India under RBI oversight.
- **Digital Public Infrastructure (DPI):** Foundational digital systems like identity, payments, and data exchange that drive public and private service delivery.
- **Merchant Discount Rate (MDR):** A fee charged to merchants for processing payments made by customers through digital channels.
- **Interoperability:** The technical capability that enables different payment apps, banks, and networks to communicate and transact seamlessly.

FOREIGN UNIVERSITY CAMPUSES IN INDIA

GS Paper II – Issues relating to development and management of education; Government policies and interventions in the education sector

Background

- India is shifting from merely sending students abroad to bringing global universities to India, in line with the internationalisation vision of NEP 2020.
- UGC Regulations, 2023 provide a framework for Foreign Higher Educational Institutions (FHEIs) to establish campuses in India.
- University of Southampton became the first university to receive an LoI[letter of intent] under the 2023 UGC framework and commenced operations in Gurugram in 2025–26.
- Deakin and Wollongong Universities were among the first foreign institutions to operate in GIFT City, Gujarat, under the IFSCA framework.

What are Foreign University Campuses?

Foreign university campuses are branch campuses established by recognised foreign higher educational institutions within India, offering programmes and degrees under a regulated Indian framework.

Objective: “Internationalisation at home” — providing global-quality education and international exposure without requiring students to leave India.

Key Opportunities

- **Improve Quality & Global Benchmarking:** Introduces international curricula, pedagogy and academic standards.
 - Ex: University of Southampton brings programmes in areas such as engineering, management and computing to India.
- **Reduce Outbound Student Migration:** Provides an alternative to studying abroad while retaining talent and expenditure within India.
 - Ex: Foreign campuses can offer international degrees without the full cost of overseas migration.
- **Strengthen Research & Innovation:** Creates opportunities for joint research, faculty exchange and global R&D networks.
 - Ex: India-Australia discussions on foreign campuses explicitly emphasised industry–education partnerships and R&D collaboration.
- **Industry–Academia Linkages:** Foreign institutions can bring industry-linked curricula and global employer networks.
 - Ex: Proposed FHEI programmes include AI, cybersecurity, data science, biomedical sciences and software engineering.
- **Make India a Global Education Hub:** Supports NEP 2020's goal of making India an attractive destination for international students.
 - Ex: Study in India portal offers 8,000+ programmes across 600+ institutions, reaching 136+ countries.
- **Academic Competition:** Competition may encourage Indian institutions to improve curriculum, faculty quality and student services.
 - Ex: Foreign campuses create benchmarking opportunities for Indian private and public universities.

Key Challenges

- **Affordability & Elite Capture:** High fees may restrict access to affluent students, creating a two-tier higher education system.
 - **Ex:** Premium foreign campuses may remain accessible mainly to students from higher-income families.
- **Quality Assurance:** Foreign institutional branding does not automatically guarantee uniform academic quality at Indian campuses.
 - **Ex:** Differences in faculty strength, infrastructure and curriculum delivery may emerge between the foreign parent campus and its Indian campus.
- **Regulatory Complexity:** Multiple regulatory frameworks can create compliance challenges across general higher education, professional courses and financial zones.
 - **Ex:** GIFT City campuses operate under the IFSCA framework, while other foreign university campuses are governed by UGC regulations.
- **Academic Autonomy vs Accountability:** Excessive regulation may discourage reputed institutions, while excessive autonomy can create risks regarding fees, admissions and quality assurance.
 - **Ex:** A balance is required between institutional autonomy and UGC-mandated quality standards.
- **Uneven Geographic Access:** Foreign university campuses may initially concentrate in major urban and economic centres, limiting access for students from smaller cities.
 - **Ex:** Current Letters of Intent (LoIs) are concentrated in states/regions such as Karnataka, Maharashtra, Delhi-NCR and Tamil Nadu.

Regulatory Framework

- **NEP 2020:** Internationalisation of Indian higher education
- **UGC Regulations, 2023:** Establishment and operation of foreign university campuses
- **IFSCA Regulations, 2022:** International branch campuses in GIFT-IFSC

Way Forward

- **Ensure Affordable Access:** Mandate transparent fee structures and scholarships for disadvantaged students.
- **Strong Quality Assurance:** Conduct periodic academic and financial audits.
- **Promote Research Partnerships:** Require meaningful collaboration with Indian universities, laboratories and industry.
 - **Ex:** India-Australia campus discussions already emphasise research and industry-education partnerships.
- **Integrate with Indian Priorities:** Encourage programmes in AI, semiconductor technology, climate science, biotechnology and advanced manufacturing. Align foreign campuses with National Education Policy 2020 and national skill requirements.
- **Expand Beyond Metros:** Provide incentives for campuses in emerging education hubs rather than concentrating only in Mumbai, Bengaluru and Delhi-NCR.
- **Protect Academic Autonomy with Accountability:** Follow the NEP principle of light but tight regulation: institutional autonomy accompanied by transparent accreditation, disclosure and grievance mechanisms.

Learn from International Models

- **UAE:** Education hubs such as Dubai Knowledge Park use international branch campuses to build global academic ecosystems.
- **Singapore:** Attracted global universities while linking them with research and innovation ecosystems.
- **China:** Uses international university partnerships to strengthen research and technological capabilities.

Conclusion

Foreign university campuses can make India a global knowledge hub, but their success depends on whether they complement rather than substitute the strengthening of domestic institutions. A framework combining global academic exposure, affordability, research collaboration and Indian regulatory accountability can turn internationalisation into an instrument of broad-based human-capital development.

KEYWORDS

- **Internationalisation at Home** – Providing global academic exposure within the domestic education system.
- **Foreign Higher Educational Institution (FHEI)** – A recognised foreign institution permitted to establish an Indian campus.
- **Global Knowledge Hub** – An ecosystem attracting international students, faculty, research and investment.
- **Academic Brain Drain** – Migration of students, researchers and faculty to foreign institutions.
- **Industry-Academia Linkage** – Collaboration between universities, industry and research institutions.

UPSC PYQ

“The quality of higher education in India requires major improvements to make it internationally competitive. Do you think that the entry of foreign educational institutions would help improve the quality of higher and technical education in the country? Discuss[2015 | GS Paper II | 12.5 Marks

INDIGENOUS DEFENSE SYSTEMS

GS-III Various Security Forces and Agencies and their Mandate.

Defence indigenisation refers to designing, developing, and manufacturing military hardware locally to achieve **strategic autonomy** and self-reliance. Historically heavily reliant on foreign imports, India has progressively shifted focus toward building a **Military-Industrial Complex (MIC)**. From early initiatives like the **Integrated Guided Missile Development Programme (IGMDP)** to modern frameworks like **Atmanirbhar Bharat**, the objective is to phase out critical import dependencies. This structural shift transforms India from the world's leading arms importer into an emerging **defence exporter** and a global manufacturing hub.

Indigenisation of Defence: Need for Indigenisation

- **Ensuring Strategic Autonomy and Sovereignty:** Heavy reliance on foreign military suppliers exposes national security to **geopolitical leverage, supply chain disruptions, and sudden embargos** during active conflicts.
 - **Ex:** Disruptions in spare parts supply for Russia-origin platforms (**Su-30MKI, T-90 tanks**) during the ongoing **Russia-Ukraine war**.
- **Mitigating Fiscal Burden and Trade Deficit:** High arms imports consume precious foreign exchange, widening the **Current Account Deficit (CAD)**, whereas domestic production retains funds within the national economy.
 - **Ex:** India accounted for **11% of global arms imports (2018-2022)** according to SIPRI, draining billions in capital expenditure.
- **Boosting Economic Growth and Job Creation:** Building a domestic defence industrial base stimulates manufacturing, creates **high-skilled employment**, and supports downstream **MSME supply chains**.
 - **Ex:** Development of **INS Vikrant** involved over 500 local automation and steel MSMEs, generating thousands of indirect jobs.
- **Enhancing Military Modernization and Customization:** Indigenous platforms allow forces to request tailored modifications suited to India's unique **border topographies** (high-altitude deserts, tropical coastlines).
 - **Ex:** Deployment of the **Light Combat Helicopter (LCH) Prachand**, specifically designed for high-altitude operations in **Siachen and Ladakh**.
- **Transforming India into a Net Defence Exporter:** Domestic indigenisation builds capacity to export cost-effective military hardware to **Friendly Foreign Countries (FFCs)** in the Global South.
 - **Ex:** India's landmark **\$375 million export deal** to supply **BrahMos shore-based anti-ship cruise missiles** to the Philippines.
- **Securing Critical and Emerging Technologies:** Developing home-grown military systems prevents **cyber-backdoors, remote surveillance**, and hardware tampering inherent in foreign platforms.
 - **Ex:** Induction of the **Secured Army Mobile Ecosystem (SAMBHAV)**, providing end-to-end encrypted 5G communications for army networks.

Government Initiatives

- **Positive Indigenisation Lists (PILs):** The Ministry of Defence issues embargo lists banning the import of specific equipment and subsystems to mandate domestic procurement.

- **Ex:** Over **4,600 items** across military platforms placed under positive indigenisation lists by the **Department of Defence Production**.
- **Defence Acquisition Procedure (DAP) 2020 Reforms:** Prioritizes procurement under the **Buy (Indian-IDDm)** category, setting minimum **Indigenous Content (IC)** requirements up to 60%.
 - **Ex:** The DAP 2020 reserved **25% of the defence R&D budget** specifically for private industry, startups, and academia.
- **Innovations for Defence Excellence (iDEX):** Fosters innovation by providing grants, funding, and mentorship to **startups, MSMEs, and individual innovators** in defence tech.
 - **Ex:** Granting **iDEX Prime awards** up to ₹10 crore for developing advanced autonomous swarm drones and AI technologies.
- **Creation of Dedicated Defence Industrial Corridors (DICs):** Establishing specialized manufacturing hubs with plug-and-play infrastructure to attract investments and build industrial clusters.
 - **Ex:** Strategic operationalization of the **Uttar Pradesh and Tamil Nadu Defence Industrial Corridors**, hosting companies like HAL and Bharat Dynamics.
- **Corporatization of the Ordnance Factory Board (OFB):** Reorganized 41 outdated ordnance factories into **7 fully state-owned Defence Public Sector Undertakings (DPSUs)** to boost efficiency and accountability.
 - **Ex:** **Advanced Weapons and Equipment India Limited (AWEIL)** and **Munitions India Limited (MIL)** registering strong post-restructuring operational profits.
- **Liberalization of Foreign Direct Investment (FDI):** Raised automatic route limits for foreign investment in defence manufacturing to attract **global Original Equipment Manufacturers (OEMs)**.
 - **Ex:** Raising FDI limits to **74% under the Automatic Route** (and up to 100% via Government Approval) to encourage technology transfer.

Challenges

- **Persistent Technological and R&D Deficit:** India continues to lag in foundational technologies like **jet engine development, semiconductor fabrication, and advanced metallurgy**.
 - **Ex:** Continued dependence on imported **GE-F404/414 engines** from the USA to power the indigenous **LCA Tejas Mk1A and Mk2**.
- **Dominance of DPSUs over Private Industry:** Defence Public Sector Undertakings historically receive preference, creating an uneven playing field for **private defense firms**.
 - **Ex:** Over **70% of total defence production** remains concentrated in state-run DPSUs like HAL and BEL, crowding out private players.
- **Inadequate Defence Budget for Capital Modernization:** A major portion of the defence budget is spent on **pensions and salaries**, leaving insufficient capital for R&D and acquisition.
 - **Ex:** Defence capital expenditure remaining below **1.5% to 2% of GDP**, falling short of the recommended 3% threshold for rapid modernization.
- **Bureaucratic Red Tape and Procurement Delays:** Prolonged acquisition cycles under complex testing and trials lead to **cost overruns and technological obsolescence**.
 - **Ex:** Decades-long procurement timeline for the **Towed Artillery Gun System (ATAGS)** before final induction orders were cleared.
- **Low Integration of Academic and Industrial R&D:** Disconnect between defense research institutions (**DRDO**), private manufacturers, and universities limits commercialization of research.

- **Ex:** Low conversion rates of **DRDO technology transfers (ToT)** into scalable, mass-manufactured private sector outputs.
- **Quality Control and Testing Infrastructure Gaps:** Private domestic companies face bottlenecks due to a lack of access to state-owned **testing ranges and certification labs**.
 - **Ex:** Delays experienced by private drone manufacturers in obtaining timely **airworthiness certifications** from military testing bodies.

Way Forward

- **Establishing an Independent Defence R&D Board:** Restructure DRDO into a lean technology advisor while delegating core commercial development to private industries.
 - **Ex:** Adopting the **US DARPA model** to fund high-risk, high-reward technologies developed by private firms and academic labs.
- **Scaling Up Private Sector Participation:** Guarantee long-term procurement visibility and multi-year order volumes to encourage private companies to invest in capital-intensive defence manufacturing.
 - **Ex:** Awarding major production contracts like the **C-295 aircraft facility** in Vadodara jointly to **Tata Advanced Systems and Airbus**.
- **Fast-Tracking Jet Engine and Subsystem Joint Ventures:** Utilize international strategic partnerships to secure **100% technology transfer** for core critical components.
 - **Ex:** The agreement between **GE Aerospace and HAL** for co-producing jet engines in India with significant technology transfer.
- **Strengthening Testing Infrastructure for Private Industry:** Opening up state-owned military testing ranges, laboratories, and trial grounds to private defence players.
 - **Ex:** Operationalization of the **DTIS (Defence Testing Infrastructure Scheme)** with a ₹400 crore outlay to set up private testing labs.
- **Promoting Defence Exports via Diplomatic Missions:** Utilize **Defence Attachés (DAs)** in foreign embassies to actively market Indian-made platforms across emerging economies.
 - **Ex:** Stationing Defence Attachés in targeted markets across **Africa, South East Asia, and Armenia** to drive export sales.

Achieving true defence indigenisation is vital for securing India's **geopolitical strategic autonomy** and propelling its economic transformation. By systematically removing bureaucratic bottlenecks, fostering private sector participation, and investing heavily in **cutting-edge technological R&D**, India can build a resilient defence ecosystem. Ultimately, transitioning from a top arms importer to a global **defence manufacturing hub** will solidify India's status as a formidable global power.

KEY WORDS

- **Defence Indigenisation** – Designing, developing and manufacturing defence equipment domestically to reduce import dependence.
- **Technology Transfer (ToT)** – Transfer of technical knowledge, manufacturing capabilities and expertise from one entity or country to another.

ARTIFICIAL INTELLIGENCE IN HEALTHCARE

(GS III - Science and Technology- Developments and their Applications and Effects in Everyday Life.)

Introduction

Artificial Intelligence (AI) is transforming healthcare through diagnostics, drug discovery, personalised treatment and clinical decision-making. Recently, the “**AI in MedTech**” Knowledge Paper highlighted the need to move from successful pilots to large-scale adoption, while the **IIM-A Healthcare Summit 2026** stressed safe, responsible and human-centred AI.

Applications of AI in Healthcare

- **Disease diagnosis and screening** : AI analyses medical images and clinical data for early detection.
 - **Ex: Qure.ai** uses AI to analyse chest X-rays for tuberculosis.
- **Drug discovery** : AI identifies potential drug molecules and predicts their effectiveness.
 - **Ex:** Start-ups in **Bengaluru and Hyderabad** use AI to shortlist drug candidates.
- **Robotic and precision surgery** : AI-assisted systems improve surgical precision and minimally invasive procedures.
 - **Ex: Apollo Hospitals** uses AI-assisted robotic surgery.
- **Personalised medicine:** AI combines genetic and clinical data for tailored treatment.
 - **Ex:** AI-based **genomic approaches for cancer treatment** at Tata Memorial Hospital.
- **Disease surveillance:** AI analyses large datasets to identify disease patterns and outbreaks.
 - **Ex:** AI-based systems support **real-time disease surveillance and outbreak prediction**.

Benefits of AI in Healthcare

- **Improves accessibility** : AI extends specialist capabilities to underserved areas.
 - **Ex:** AI-enabled diagnostic tools can support **primary and secondary healthcare**.
- **Reduces healthcare costs:** Automation reduces resource requirements.
 - **Ex:** AI-based **medical imaging and pathology** can reduce diagnostic costs.
- **Enhances diagnostic accuracy:** AI identifies patterns that may be difficult to detect manually.
 - **Ex:** AI-assisted detection of **diabetic retinopathy**.
- **Saves doctors' time:** AI automates documentation and repetitive tasks.
 - **Ex:** AI-based **hospital workflow automation**.
- **Accelerates medical research:** AI supports clinical-trial design and patient recruitment.
 - **Ex:** AI-assisted **clinical-trial patient recruitment and trial design**.

Challenges of AI in Healthcare

- **Data privacy and security:** Sensitive health data increases risks of breaches and misuse.
 - **Ex:** Digitally linked health records under **ABDM** require strong safeguards.
- **Algorithmic bias** : Non-representative datasets can produce unequal outcomes.
 - **Ex:** Models trained on limited populations may perform poorly on diverse populations.
- **Lack of explainability and accountability:** AI decisions may be difficult to understand, creating accountability issues.
 - **Ex:** Adaptive **AI-enabled medical devices** require lifecycle-based oversight.

- **Fragmented data and inadequate evidence:** Lack of interoperable and validated data limits adoption.
 - **Ex:** The **AI in MedTech Knowledge Paper** identifies fragmented health data and limited evidence as barriers.
- **Infrastructure and skill gaps:** AI requires computing capacity, software, finance and skilled professionals.
 - **Ex:** Pharmaceutical AI faces gaps in **computing capacity, software licensing and specialised talent**.

Way Forward

- **Strengthen regulatory oversight :** Ensure lifecycle-based regulation with continuous testing and monitoring.
 - **Ex: AI in MedTech Knowledge Paper** recommends lifecycle-based regulation for adaptive AI systems.
- **Build digital health infrastructure :** Develop secure and interoperable health-data systems.
 - **Ex: Ayushman Bharat Digital Mission (ABDM)** is building an integrated digital health ecosystem.
- **Promote responsible AI:** Ensure transparency, validation, accountability and human oversight.
 - **Ex: SAHI and BODH** support responsible and evidence-based healthcare AI.
- **Strengthen AI research and innovation:** Improve funding, computing infrastructure and skilled manpower.
 - **Ex: IndiaAI Mission** and **National Biopharma Mission** support AI-led healthcare innovation.
- **Scale successful AI solutions:** Expand validated AI solutions while retaining clinical oversight.
 - **Ex: Centres of Excellence for AI in healthcare** at AIIMS New Delhi, PGIMER Chandigarh and AIIMS Rishikesh support research and adoption.

Conclusion

AI can make Indian healthcare **more accessible, preventive, personalised and efficient**. Its benefits require **data protection, clinical validation, ethical regulation and human oversight**, ensuring AI complements rather than replaces medical expertise.

KEYWORDS

- **AI in MedTech (Artificial Intelligence in Medical Technology):** Scaling AI from pilots to healthcare-wide adoption.
- **ABDM (Ayushman Bharat Digital Mission) :** Building interoperable digital health infrastructure.
- **SAHI (Strategy for Artificial Intelligence in Healthcare for India) & BODH (Benchmarking Open Data Platform for Health AI) :** Promoting responsible and evidence-based healthcare AI.
- **Human-Centred AI (Human-Centred Artificial Intelligence):** Ensuring AI complements, rather than replaces, medical expertise.

INDIA'S ENERGY SECURITY AND DEPENDENCE ON IMPORTED CRUDE OIL AND LPG

(GS III - Indian Economy and issues relating to Planning, Mobilization of Resources, Growth, Development and Employment.)

Introduction

India's high dependence on imported hydrocarbons makes energy security vulnerable to **geopolitical disruptions and price shocks**. The proposed strategic-fuel system, with **28 MT crude oil, 9 MT Liquefied Natural Gas (LNG) and 4 MT Liquefied Petroleum Gas (LPG) storage**, aims to strengthen fuel buffers and supply resilience.

India's Energy Dependence

- **Crude oil:** Import dependence is around **88–89%**, while declining domestic production increases exposure to global markets.
- **LPG gap:** India consumed about **31 MT in 2024–25**, against **13 MT domestic production**, resulting in around **62% import reliance**.
- **Chokepoint dependence:** Around **80% of LPG imports** pass through the **Strait of Hormuz**.
- **U.S. diversification:** A **2.2 MTPA (Million Tonnes Per Annum) U.S. LPG deal** covers 2026; India targets up to **25% (5 MT) of LPG imports from the U.S. by 2027**.
- **Refining strength:** India has around **258 MTPA refining capacity**, producing **283.77 MMT petroleum products** and exporting **65.08 MMT in 2024–25**.

Key Challenges

- **Geopolitical vulnerability:** Conflicts and regional tensions can disrupt energy routes, affecting the continuity of energy supplies.
 - **Ex:** Disruptions in the **Strait of Hormuz** can affect LPG supplies and delay shipments to India.
- **Price Fluctuations:** Global price and freight shocks raise economic pressures, increasing import expenditure and domestic energy costs.
 - **Ex:** West Asian conflicts can increase **inflation and import costs**, affecting consumers and industries.
- **Supplier concentration:** LPG imports remain heavily dependent on Gulf suppliers, exposing India to supply disruptions in the region.
 - **Ex:** **Saudi Arabia, United Arab Emirates (UAE), Qatar and Kuwait** are key traditional suppliers of LPG to India.
- **Limited LPG storage:** Strategic LPG reserves remain inadequate to manage prolonged supply disruptions and sudden increases in demand.
 - **Ex:** Mangaluru and Visakhapatnam together have about **1.4 lakh tonnes** of underground LPG storage, limiting the available strategic buffer.
- **Rising demand:** Wider clean-cooking access is increasing LPG requirements, putting additional pressure on domestic production and imports.
 - **Ex:** **Pradhan Mantri Ujjwala Yojana (PMUY)** has provided **over 10 crore connections**, expanding access to clean cooking fuel among rural and economically weaker households.

Way Forward

- **Diversify suppliers and routes:** Reduce dependence on concentrated supply chains by expanding import sources and ensuring access to alternative transportation routes.
 - Ex: Expand U.S., Canadian, Algerian and other LPG supplies; target 25% U.S. sourcing by 2027 to diversify import dependence.
- **Strengthen strategic storage:** Create larger emergency fuel buffers to ensure uninterrupted energy supplies during geopolitical disruptions and price shocks.
 - Ex: Proposed storage of 28 MT crude oil, 9 MT LNG and 4 MT LPG to enhance strategic reserves.
- **Boost domestic LPG production:** Increase refinery output during supply disruptions to reduce import dependence and meet domestic consumption requirements.
 - Ex: 2026 measures directed refineries to maximise LPG production for domestic use to improve supply availability.
- **Reduce fossil-fuel dependence:** Promote alternative fuels and pipeline gas to diversify the energy mix and reduce reliance on imported petroleum products.
 - Ex: Ethanol Blended Petrol (EBP), Compressed Biogas (CBG) and Piped Natural Gas (PNG) transition measures to encourage cleaner fuel alternatives.
- **Accelerate clean-energy transition:** Expand renewables, electric mobility and green hydrogen to reduce dependence on fossil fuels and strengthen long-term energy security.
 - Ex: National Green Hydrogen Mission (NGHM) has an outlay of ₹19,744 crore to promote green hydrogen production and adoption.

Conclusion

India must shift from **fuel availability to energy resilience**. Diversified supplies, strategic reserves, domestic production, demand management and clean energy can reduce external vulnerability while ensuring **reliable and affordable energy**.

KEYWORDS

- **Strategic Fuel System** – Proposed 28 MT crude oil, 9 MT LNG and 4 MT LPG reserves to strengthen energy resilience.
- **LPG Import Dependence** – India relies on imports for around 62% of its LPG consumption.
- **Strait of Hormuz** – A critical maritime choke point for India's imported crude oil and LPG.
- **U.S. LPG Diversification** – India targets up to 25% of LPG imports from the U.S. by 2027.
- **National Green Hydrogen Mission (NGHM)** – Promotes green hydrogen production to reduce long-term fossil-fuel dependence.

INDIA'S ELECTRIC VEHICLE (EV) ECOSYSTEM

GS Paper III – Developments and applications of science & technology; Infrastructure: Energy, Transportation

Background

India's EV transition is moving from policy-led adoption to ecosystem development, covering vehicles, batteries, charging infrastructure, manufacturing, critical minerals, recycling and grid integration. EV penetration reached 7.66% of vehicle sales in 2024. The government's long-term ambition is around 30% EV share of total vehicle sales by 2030.

What is an EV Ecosystem?

An EV ecosystem comprises the entire value chain required for electric mobility:

EV manufacturing to batteries & critical minerals to charging/swapping to electricity/grid to financing to R&D to recycling & second-life use to skilled manpower.

Opportunities / Significance

- **Energy Security:** Reduces dependence on imported petrol and diesel.
 - Ex: NITI Aayog estimates that high EV penetration could save 474 MTOE of oil demand over vehicle lifetimes.
- **Decarbonisation:** Zero tailpipe emissions and lower lifecycle emissions when powered by clean electricity.
 - Ex: PM E-DRIVE estimated that 10.27 lakh EVs sold by March 2025 avoided ~2.3 lakh tonnes of CO₂.
- **Cleaner Cities:** Cuts local PM, NO_x and noise pollution, particularly from urban transport.
 - Ex: Electrification of buses and 2/3-wheelers can target high-density urban pollution.
- **Manufacturing & Jobs:** Creates opportunities in batteries, motors, power electronics, software and charging equipment.
 - Ex: SPMEPCI targets 25% domestic value addition by 3 years and 50% by 5 year.
- **Digital & Grid Innovation:** Enables smart charging, Vehicle-to-Grid (V2G), battery swapping and renewable-energy integration.
 - Ex: China is standardising V2G and expects EVs to provide 10 GW of flexible capacity by 2030.

Key Challenges

- **High Upfront Cost:** Batteries constitute a major share of EV costs, making them expensive for price-sensitive consumers.
 - Ex: Higher purchase prices can discourage adoption despite lower running and maintenance costs.
- **Charging Infrastructure Gap:** Uneven distribution and inadequate fast-charging facilities contribute to range anxiety.
 - Ex: 52,718 public charging stations were reported in July 2026, but their distribution remains uneven.
- **Battery & Critical-Mineral Dependence:** Dependence on imported lithium, cobalt, nickel and rare-earth materials creates supply and price risks.
 - Ex: India's limited domestic availability of key battery minerals increases exposure to global supply-chain disruptions.

- **Grid & Renewable-Energy Constraints:** Large-scale EV charging can increase peak electricity demand and grid stress.
 - **Ex:** EVs provide greater climate benefits when charging is increasingly powered by renewable energy.
- **Battery Waste:** End-of-life batteries pose risks of fire, toxic leakage and resource loss if poorly managed.
 - **Ex:** Battery Waste Management Rules, 2022 impose Extended Producer Responsibility (EPR) on producers

Government Initiatives

- **NEMMP 2020:** Long-term electric-mobility roadmap
- **FAME I & II:** Provide incentives and charging infrastructure
- **PM E-DRIVE, ₹10,900 crore:** EV adoption, e-buses, charging infrastructure and ecosystem development
- **PLI-Auto:** Advanced automotive technology & domestic manufacturing
- **PLI-ACC Battery:** Domestic advanced-cell manufacturing
- **SPMEPCI:** Attracts EV passenger-car manufacturing investment
- **BWM Rules 2022:** EPR-based battery recycling/refurbishment

Way Forward

- **Build a National Charging Network:** Develop urban charging hubs and highway fast-charging corridors. NITI Aayog suggests 1 charger per 30 EVs and charging/swapping stations every 50–100 km on highways.
- **Make Batteries a Strategic Industry:** Scale PLI-ACC, domestic cell manufacturing and mineral processing like EU's battery value-chain approach linking manufacturing with recycling.
- **Strengthen Critical-Mineral Security:** Diversify overseas mineral supplies through KABIL, recycling and mineral exploration. Promote alternatives such as LFP, sodium-ion and other low-critical-mineral chemistries.
- **Create a Circular EV Economy:** Implement BWM Rules through strong collection, traceability and recycling. Encourage second-life batteries for stationary energy storage.
- **Electrify Public & Commercial Transport First:** Prioritise buses, taxis, delivery fleets, 2/3-wheelers where utilisation is high.

International Best Practices:

- **China:** Large-scale fast-charging deployment + integrated EV manufacturing.
- **Norway:** Strong fiscal incentives and charging infrastructure; EVs constituted about 97% of new car sales in 2025.
- **EU:** Battery regulation linking EV expansion with traceability and circularity.
- **China:** V2G integration to use EVs as flexible grid resources.

Conclusion

India needs to move “from EV adoption to an EV ecosystem”—combining clean electricity, domestic batteries, reliable charging, critical-mineral security and circular recycling. A coordinated vehicle–battery–grid–recycling value chain can make electric mobility simultaneously an instrument of energy security, industrial competitiveness and decarbonisation.

KEYWORDS

Electric Mobility Ecosystem – Integrated network of vehicles, batteries, charging, grid and recycling.

Vehicle-to-Grid (V2G) – Bidirectional flow of electricity between EVs and the grid.

Battery Swapping – Replacing depleted batteries with charged ones to reduce charging downtime.

Circular Economy – Recovery, reuse and recycling of batteries and EV components.

Total Cost of Ownership (TCO) – Purchase + operating + maintenance costs over the vehicle's lifetime.

Smart Charging – Optimising charging according to grid demand, electricity prices and renewable availability.

UPSC PYQ

“The adoption of electric vehicles is rapidly growing worldwide. How do electric vehicles contribute to reducing carbon emissions and what are the key benefits they offer compared to traditional combustion engine vehicles?”
[2023, GS Paper III – 15 Marks]

MINES AND MINERALS (DEVELOPMENT AND REGULATION) AMENDMENT ACT, 2026

GS Paper III – Infrastructure; Mineral Resources and Investment

Background

The Mines and Minerals (Development and Regulation) Amendment Act, 2026 seeks to establish a more uniform fiscal framework for the mining sector by expanding Central regulatory authority over mineral-bearing lands and restricting certain State-level levies.

The amendment addresses concerns over unpredictable and multiple levies on mining operations, which can increase production costs and discourage investment.

Key Provisions of the Act

- **Regulation of Mineral-Bearing Lands:** The amendment expands the scope of the Union's regulatory framework to include mineral-bearing lands, in addition to mines and mineral development.
- **Restriction on State-Level Levies:** A new Section 9D restricts State Governments from imposing taxes, cesses or other levies on mineral rights and mineral-bearing lands, except in accordance with conditions or restrictions prescribed by the Centre.
- **Retrospective Treatment of Unpaid Levies:** Certain State levies imposed before the amendment but not deposited with or recovered by the State before its commencement are deemed invalid.
- **Protection of Amounts Already Recovered:** Taxes, cesses and other levies already deposited with or recovered by State Governments before commencement are not refundable under the amendment.
- **Central Rule-Making Power:** The amendment modifies Section 13 to empower the Centre to prescribe conditions and restrictions governing such State levies.

Significance of the Amendment

- **Investment Certainty:** A more predictable fiscal regime can reduce uncertainty arising from multiple and changing State-level levies.
 - **Ex: Commercial coal mining auctions initiated in 2020** marked a shift towards greater private-sector participation in India's coal sector.
- **Ease of Doing Business:** A more uniform framework can reduce the burden of overlapping levies on mining companies operating across States.
 - **Ex: India's National Mineral Policy, 2019** emphasises transparency, predictability and private-sector participation in mineral development.
- **Mineral Sector Development:** Greater fiscal predictability can encourage investment in mineral exploration, extraction and processing.
 - **Ex: The National Critical Mineral Mission, 2025,** seeks to strengthen domestic critical-mineral exploration, mining, processing and supply chains.
- **Industrial Competitiveness:** Predictable mining costs can support industries dependent on mineral inputs, including steel, cement and manufacturing.
 - **Ex: India's National Steel Policy, 2017** targets crude steel capacity of 300 million tonnes by 2030–31, requiring reliable supplies of iron ore and other mineral inputs.

- **Fiscal Stability:** A consistent fiscal framework can improve predictability for mineral-producing States and mining companies.
 - **Ex: District Mineral Foundation (DMF) funds** provide a statutory mechanism for channeling mining-related contributions towards the welfare of mining-affected areas.

Challenges

- **Fiscal Federalism:** Restrictions on State-level levies raise concerns about the balance between Central regulatory authority and State fiscal powers.
 - **Ex: Entry 49 of the State List** empowers States to tax lands and buildings, while **Entry 50** deals with taxation of mineral rights, subject to limitations imposed by Parliament.
- **State Revenue Uncertainty:** Changes to the levy framework may affect States' ability to introduce new sources of mineral-related revenue.
 - **Ex: Odisha and Jharkhand**, major mineral-producing States, depend substantially on mineral-related revenue to support their public finances.
- **Legal and Constitutional Questions:** The amendment changes the framework governing State taxation of mineral rights and mineral-bearing lands, raising questions about the distribution of legislative powers.
 - **Ex: In Mineral Area Development Authority v. Steel Authority of India Ltd. (2024)**, the Supreme Court recognised States' power to tax mineral rights and mineral-bearing lands within the constitutional framework.
- **Environmental and Social Concerns:** Greater investment in mining must be accompanied by environmental safeguards and protection of communities affected by mining.
 - **Ex: Hasdeo Arand in Chhattisgarh** has witnessed disputes over coal mining, forest diversion and the livelihoods of forest-dependent communities.
- **Implementation Uncertainty:** The practical impact of the new framework will depend on the Central Government's prescribed parameters and conditions.
 - **Ex:** The Act's commencement depends on a Central Government Gazette notification.

Way Forward

- **Strengthen Cooperative Federalism:** Consult State Governments while framing rules on mineral-bearing lands and State-level levies.
 - **Ex:** Use the **Inter-State Council** as a platform for structured Centre-State consultation on mineral-sector fiscal issues.
- **Ensure Fiscal Predictability:** Clearly define permissible levies, applicable conditions and the treatment of existing dues.
 - **Ex:** Publish transparent rules specifying the conditions and restrictions under Section 9D.
- **Improve Regulatory Clarity:** Establish objective and transparent parameters for identifying mineral-bearing lands.
 - **Ex:** Use geological mapping and mineral-resource assessment by the **Geological Survey of India (GSI)** to support consistent identification.
- **Promote Sustainable Mining:** Link investment expansion with environmental protection, mine reclamation and responsible mineral extraction.
 - **Ex:** Strengthen environmental monitoring through the **PARIVESH portal**, which facilitates online environmental, forest and wildlife clearance processes.
- **Protect Mining-Affected Communities:** Ensure that mineral development translates into local employment, infrastructure and social development.

- **Ex:** Implement the **Pradhan Mantri Khanij Kshetra Kalyan Yojana (PMKKKY)** to improve healthcare, drinking water and livelihood opportunities in mining-affected areas.
- **Strengthen Legal Certainty:** Ensure that implementation rules remain consistent with constitutional provisions and judicial decisions.
 - **Ex:** Issue clear implementation guidelines addressing the constitutional distinction between Entries 49 and 50 of the State List.

The MMDR Amendment Act, 2026, marks a shift towards a more predictable mining-sector fiscal framework. Its success will depend on balancing investment certainty, State fiscal autonomy and sustainable mineral development.

KEYWORDS

1. **Mineral-Bearing Land** – Land containing mineral contents as defined by parameters prescribed under the MMDR Act.
2. **Fiscal Predictability** – Stability and clarity in the taxes, cesses and other levies applicable to mining operations.
3. **Mineral Rights** – Legal rights relating to the exploration, extraction and development of minerals.
4. **Fiscal Federalism** – Distribution of taxation powers and financial resources between the Union and States.
5. **Cooperative Federalism** – Coordination between the Centre and States in implementing mineral-sector policies.
6. **Sustainable Mining** – Mineral extraction that balances economic development with environmental protection and community welfare.
7. **District Mineral Foundation (DMF)** – A statutory institution established to benefit people and areas affected by mining.

UPSC PYQ

Mineral resources are fundamental to the country's economy and these are exploited by mining. Why is mining considered an environmental hazard? Explain the remedial measures required to reduce the environmental hazard due to mining (2025)

MODEL QUESTIONS

1. Explain the concept of 'Demographic Dividend'. Discuss how bridging the gender gap and fixing the skill-mismatch in the workforce are critical to realizing its full potential. ?" (10 Marks, 150 Words)
2. Women-led development marks a shift from treating women as beneficiaries of welfare to recognising them as active agents of economic growth, social transformation and nation-building." Discuss. (150 words)
3. "Fiscal federalism is central to balancing fiscal autonomy, regional equity and cooperative federalism in India." Discuss the major challenges to fiscal federalism and suggest measures to strengthen it. (250 words, 15 marks)
4. Examine the structural and colonial bottlenecks plaguing the Indian policing and criminal justice system. To what extent do the recently enacted criminal codes (*BNS, BNSS, and BSA*) address these systemic challenges, and what further reforms are required to build a citizen-centric security apparatus?" (15 Marks, 250 Words)
5. Central Asia is increasingly important for India's energy security, strategic connectivity and regional security. However, India's engagement faces challenges of limited physical connectivity, China's growing influence and geopolitical instability. **Discuss the opportunities and challenges in India-Central Asia relations and suggest measures to strengthen the partnership.**
6. "Examine the governance and accountability challenges plaguing sports administration in India. Discuss the institutional measures required to foster an athlete-centric sporting ecosystem."
7. "Evaluate the transformational impact of the Unified Payments Interface (UPI) as a Digital Public Infrastructure. Discuss the key operational and financial challenges it faces and the measures needed to ensure its long-term sustainability
8. Foreign university campuses can transform India from a destination for overseas education into a global education hub." Discuss the opportunities and challenges.[10 Marks | 150 Words
9. Defence indigenisation is essential not only for India's strategic autonomy but also for technological advancement and economic growth. Examine the major challenges in achieving defence indigenisation in India and suggest measures to build a robust and globally competitive domestic defence ecosystem.
10. Artificial Intelligence (AI) has the potential to transform healthcare delivery in India, but its adoption also raises concerns regarding privacy, bias, accountability and regulatory oversight. Discuss the applications, benefits and challenges of AI in healthcare. Suggest measures to ensure its safe, responsible and inclusive adoption.(15 Marks, 250 Words)
11. India's high dependence on imported crude oil and Liquefied Petroleum Gas (LPG) exposes its energy security to geopolitical disruptions, supply-chain vulnerabilities and price volatility. Examine the challenges and suggest measures to strengthen India's energy security and resilience. (15 Marks, 250 Words)
12. Despite rapid growth in EV sales, India faces significant bottlenecks in batteries, charging infrastructure and critical minerals. Analyse and suggest measures to build a resilient electric-mobility ecosystem.[15 Marks | 250 Words]
13. The Mines and Minerals (Development and Regulation) Amendment Act, 2026, seeks to establish a predictable fiscal framework for India's mining sector. Examine its key provisions, significance and challenges, with particular reference to Centre-State fiscal relations." (15 Marks, 250 Words)