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Features :

Arranged as per syllabus Topics
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News Papers editorials

INDEX

We need to underline value of collaboration on climate change

Source: The post **"We need to underline the value of collaboration on climate change"** has been created, based on **"We need to underline the value of collaboration on climate change"** published in **"Indian Express" on 23rd February 2026.**

UPSC Syllabus: GS Paper-3- Environment

Context: Global climate governance is facing serious stress because trust in multilateral institutions is weakening and major economies like the United States have reduced participation in international commitments. This weakens the rule-based global climate architecture under the UNFCCC and makes cooperation even more necessary to address climate change effectively.

Importance of Collaboration on Climate Change

1. Climate Change is a Global Commons Problem

    a.   Climate change is a transboundary issue because greenhouse gas emissions spread globally regardless of where they originate.

    b.   No single country can achieve targets like limiting warming to 1.5°C on its own.

    c.   Therefore, coordinated global action is necessary to prevent carbon leakage and policy inefficiencies.

2. Protecting Vulnerable Populations

    a.   Collective climate action is important because it protects vulnerable populations such as small island nations, poor communities, and developing countries that are most affected by climate disasters.

    b.   Climate justice requires shared responsibility so that the costs and benefits of climate action are distributed fairly.

3. Bridging the Climate Finance Gap

    a.   Climate transition requires massive financial investments that most developing countries cannot mobilise alone. Reports by NITI Aayog show that India needs huge investments to achieve net-zero targets.

    b.   Therefore, multilateral cooperation is essential for mobilising climate finance, technology transfer, and capacity building.

4. Technology Sharing and Innovation

    a.   International collaboration accelerates research and development in renewable energy and clean technologies.

    b.   Joint innovation reduces the cost of green technology and makes it accessible to developing countries. Technology partnerships also help in scaling climate solutions quickly.

5. Maintaining Rule-Based International Order

    a.   Multilateral agreements create predictable and transparent frameworks for climate action.

    b.   Bilateral deals based only on national interests can weaken global goals. Cooperation builds trust, accountability, and fairness in climate governance.

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Challenges to Multilateral Climate Cooperation

1. Geopolitical Rivalries: Geopolitical rivalries among major powers have led to trade wars and protectionist policies, which weaken trust and reduce willingness to cooperate on climate action.

2. Climate Finance Disputes: There are persistent disagreements between developed and developing countries over climate finance responsibilities, with developing nations demanding greater financial support and technology transfer for their transition efforts.

3. Equity Concerns: Equity concerns arise because developed countries have historically contributed more to global emissions, while developing countries still need policy space for economic growth and poverty reduction.

4. Unilateral Trade Measures: Unilateral trade measures such as carbon border adjustment taxes create friction among countries and may be perceived as disguised protectionism rather than genuine climate action.

5. Implementation Gap: There is a large gap between climate commitments made by countries and their actual implementation, which undermines confidence in global climate agreements under the UNFCCC.

India's Role in Strengthening Collaboration

1. Advocacy for Equity-Based Framework: India has consistently advocated an equity-based global climate framework that recognises the principle of common but differentiated responsibilities.

2. Strong Domestic Renewable Push: India is pursuing ambitious domestic renewable energy targets and promoting initiatives such as solar expansion and green hydrogen to demonstrate leadership in climate action.

3. Promoting Global Dialogue: Platforms organised by The Energy and Resources Institute encourage dialogue between developed and developing countries and help build consensus on climate solutions.

4. Value-Based Leadership: India's climate diplomacy is grounded in principles like Vasudhaiva Kutumbakam, which emphasise global cooperation and shared responsibility.

Way Forward

1. Strengthen Multilateral Institutions: Countries should reinforce global climate processes under the UNFCCC and improve compliance mechanisms to ensure accountability.

2. Promote Innovative Climate Finance: Innovative financing instruments such as green bonds, blended finance, and debt-for-climate swaps should be expanded to mobilise large-scale investments for climate transition.

3. Ensure Inclusive Decision-Making: Decision-making processes must include representation from developing nations and local communities so that climate policies address real needs on the ground.

4. Focus on Implementation: Countries should shift attention from prolonged negotiations to effective implementation of agreed climate actions and create joint monitoring frameworks to track progress.

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5. Build Trust Among Nations: Trust can be strengthened through transparent reporting, fair sharing of responsibilities, and predictable financial commitments from developed countries.

Conclusion: Collaboration on climate change is essential because climate problems are global in nature and affect the most vulnerable populations first. Collective action helps mobilise finance, technology, and trust while maintaining a rule-based global order. Strengthening multilateralism is therefore necessary for achieving climate goals and ensuring sustainable and equitable development for all.

Question: In the context of weakening multilateralism, underline the value of collaboration on climate change.

Source: Indian Express

Parliament's historic law, an extended wait for women

Source: The post **"Parliament's historic law, an extended wait for women"** has been created, based on **"Parliament's historic law, an extended wait for women"** published in **"The Hindu" on 23rd February 2026.**

UPSC Syllabus: GS Paper-2- Governance

Context: The passage of the Women's Reservation Act in 2023 was hailed as a historic step towards gender justice in India. The Act promises 33% reservation for women in the Lok Sabha and State Assemblies. However, linking its implementation to Census and delimitation has created serious concerns about delay and effectiveness.

Key Features of the Women's Reservation Act

1. The Act reserves one-third of seats in the Lok Sabha and State Legislative Assemblies for women.
2. It includes sub-reservation for Scheduled Caste and Scheduled Tribe women.
3. It mandates rotation of reserved constituencies after every general election.
4. It makes implementation conditional upon the first Census after 2026 and subsequent delimitation.

Why the Implementation May Be Delayed

1. Census Requirement: The Act requires a national Census before reservation begins. Since the next Census is expected after 2026, implementation cannot start before data publication.

2. Delimitation Exercise: After the Census, a Delimitation Commission must redraw constituencies under Article 82. Past delimitation exercises have taken 3–6 years, making implementation before 2034 unlikely.

3. Legal and Logistical Constraints: Redrawing 543 Lok Sabha and thousands of Assembly constituencies is complex. It must balance population, geography, SC/ST reservations, and now women's quotas.

4. Political Calculations: Immediate reservation would displace many male incumbents. Linking reservation to delimitation allows expansion of seats instead of replacement, reducing political resistance.

Major Concerns with the Act

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1. Representation Delayed: Women may not benefit from reservation until 2034 or later, defeating the purpose of timely gender justice.

2. Link with North–South Seat Debate: Delimitation may change seat distribution among States, reviving federal tensions about population growth and representation.

3. Exclusion of Upper Houses: The Act does not cover the Rajya Sabha and State Legislative Councils, limiting its scope.

4. No OBC Sub-Reservation: Other Backward Class women are not given separate quotas, despite their large population share.

5. Unclear Rotation Mechanism: The Act does not clearly explain how constituency rotation will work, creating administrative and political confusion.
Importance of Women's Political Representation

1. Women's representation improves policymaking on health, education, and welfare.
2. It strengthens inclusive democracy and gender equality.
3. Local government reservations in India have already shown positive governance outcomes.
4. Greater participation empowers marginalised communities.

Way Forward

1. Amend the Constitution for Immediate Implementation: Parliament can delink reservation from delimitation through another constitutional amendment.

2. Temporary Expansion of Lok Sabha: Seats could be increased to accommodate women's reservation without displacing existing members.

3. Clear Implementation Roadmap: The government should publish a timeline for Census, delimitation, and reservation rollout.

4. Extend Reservation to Upper Houses: Reservation should also cover the Rajya Sabha and Legislative Councils for complete representation.

5. Provide OBC Sub-Reservation: Including OBC women will ensure broader social justice.

6. Define Rotation Rules Clearly: Transparent rules must be created in consultation with experts and women's organisations.

Conclusion: The Women's Reservation Act is a landmark constitutional promise, but its linkage with Census and delimitation risks delaying justice to half of India's population. True empowerment requires immediate and sincere implementation. As rightly emphasised by S. Y. Quraishi, representation delayed is representation denied. India must now convert its historic legislation into real political empowerment for women.

Question: Discuss the Women's Reservation Act, 2023 and the concerns regarding its delayed implementation. Suggest the way forward.

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Protecting the Freedom of Speech of MPs

UPSC Syllabus: Gs Paper 2- Parliament and State legislatures—structure, functioning, conduct of business, powers & privileges and issues arising out of these.

Introduction

Recent developments in Parliament have brought renewed attention to the need for **protecting the freedom of speech of Members of Parliament**, a constitutional privilege guaranteed under Article 105. While procedural rules regulate debate and maintain order, concerns have arisen that their application may be restricting rather than safeguarding this freedom. The central issue is whether institutional practices are preserving or weakening the constitutional protection that enables Parliament to function through open and fearless discussion.

Constitutional and Institutional Framework Governing Parliamentary Speech

1. **Dual structure of free speech:** Article 19 guarantees freedom of speech to all citizens, while Articles 105 and 194 provide special legislative privilege to MPs and MLAs.

2. **Enhanced constitutional protection:** Legislators cannot be punished for any speech or vote inside the House, giving their expression stronger protection than that available to ordinary citizens.

3. **Immunity from judicial scrutiny:** Courts are barred from inquiring into parliamentary proceedings, ensuring that legislative deliberation remains institutionally autonomous and legally protected.

4. **Internal regulation by legislatures:** Speech is subject only to constitutional provisions and standing orders of the House, which organise debate without overriding constitutional guarantees.

5. **Limits cannot destroy rights:** Restrictions are valid only when they regulate conduct without eclipsing the substance of **freedom of speech** protected under the Constitution.

6. **Purpose of parliamentary privilege:** Special protection exists to ensure free, frank, and fearless debate, allowing legislatures to function effectively without external pressure or suppression.

7. **Regulation as facilitation, not control:** Procedural rules maintain order, dignity, and discipline, but they exist to support constitutional speech rights, not to replace them.

8. **Specific constitutional restriction:** Article 121 bars discussion on conduct of judges except during removal motions.

9. **Examples of procedural limits:** Rules restrict sub judice matters, personal allegations, and defamatory charges without prior notice.

The Expunction Controversy and Its Implications

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1. **Right to recorded speech:** MPs are entitled to speak freely and have their full remarks entered in official records, because incomplete recording weakens representation and public accountability processes.

2. **Scope of Rule 380:** Presiding officers may remove unparliamentary, defamatory, indecent, or undignified words, but the rule allows deletion only of specific offending expressions, not entire sentences or paragraphs.

3. **Effects of excessive expunction:** Removing large portions of speeches can distort meaning, make arguments incoherent, and effectively undermine the constitutional protection given to parliamentary expression and representation itself.

4. **Duty while exercising authority:** Presiding officers must protect dignity of debate while ensuring that disciplinary powers do not diminish or narrow the essential **freedom of speech** of members.

5. **Mindless application and historical record:** Speeches preserved for posterity lose coherence when rules are applied mechanically, weakening institutional memory and reducing the value of parliamentary deliberation over time.

Importance of Free Speech in Parliamentary Democracy

1. **Protection from executive dominance:** Free speech allows legislators to debate without fear, preventing the executive from controlling or suppressing parliamentary discussion.

2. **Foundation of democratic governance:** Open expression in legislatures sustains liberal democracy by ensuring that diverse views are debated before decisions are made.

3. **Essential for legislative oversight:** Parliament can effectively check and scrutinise the executive only when members freely question policies, actions, and decisions.

4. **Integrity of legislative functioning:** Fearless discussion preserves credibility of parliamentary processes and ensures that public concerns are properly represented.

5. **Strengthening deliberative capacity:** Meaningful lawmaking depends on open, uninterrupted debate, and restricting speech weakens Parliament's ability to examine issues fully.

6. **Transparency and public confidence:** Open debate makes proceedings visible and understandable to citizens, building trust in fairness and accountability of institutions.

7. **Prevention of misuse of procedural powers:** When speech is protected, procedural rules cannot easily be used as tools to silence dissent or control debate.

8. **Maintenance of parliamentary equilibrium:** Democratic stability depends on the majority governing and the minority criticising, and free speech keeps this balance functional.

Functional Role of Opposition in Parliamentary Democracy

1. **Essential place of Opposition:** Democratic legislatures require active criticism of government actions, because questioning authority and challenging ministers are central responsibilities of opposition members in parliamentary governance systems.

2. **Informational value of dissenting voices:** Listening to opposition speeches helps reveal realities beyond official narratives, ensuring Parliament receives complete and accurate information necessary for responsible decision making processes.

3. **Mutual forbearance as democratic principle:** Parliamentary government functions when the majority governs and the minority critiques, with both sides respecting each other's constitutional roles and institutional legitimacy continuously.

4. **Erosion of working relationship:** Preventing opposition leaders from speaking and attempts at extreme punitive measures reflect breakdown of trust, cooperation, and balanced functioning within parliamentary political processes today.

Normative Foundations of Parliamentary Conduct and Practice

1. **Established democratic conventions:** Parliamentary conduct rests on shared norms of respect, accountability, and open debate, which guide behaviour beyond formal written rules and legal provisions governing legislative functioning.

2. **Accountability through presence and engagement:** Active participation during proceedings ensures correct and complete information reaches Parliament, strengthening transparency, responsibility, and informed decision making within institutional processes of governance.

3. **Respect for critical voices:** Hearing opposition arguments is necessary to understand realities that may not emerge from supportive party statements, thereby deepening deliberation and strengthening representative functioning overall.

4. **Norms protect democratic balance:** These practices sustain cooperation between government and Opposition, ensuring legislative work proceeds with restraint, responsibility, and recognition of institutional interdependence within parliamentary democracy itself.

Conclusion

Protecting **freedom of speech** in Parliament is essential for democratic balance and effective governance. Procedural rules must regulate debate without eroding constitutional guarantees or silencing dissenting voices. Restoring mutual respect between government and Opposition is necessary to preserve institutional integrity, meaningful deliberation, and the long term stability of parliamentary democracy for present and future generations across India.

Question for practice:

Evaluate whether the application of procedural rules in Parliament, particularly expunction of speeches, is undermining the constitutional freedom of speech of legislators and affecting democratic functioning.

Source: The Hindu

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India's leap, from back office to global brain trust

UPSC Syllabus: Gs Paper 3- Indian Economy and issues relating to planning, mobilisation of resources, growth, development and employment.

Introduction

By early 2026, India has moved far beyond its old role as the world's low-cost outsourcing hub. It has become a strategic nerve centre for global corporations. Former captive units have transformed into **Global Capability Centres (GCCs)** that guide innovation, strategy, and intellectual property creation. These centres now drive global value creation rather than routine work. This structural shift marks a decisive turning point in India's economic role and positions it as a global knowledge and innovation powerhouse.

What is Global Capability Centres (GCCs)

1. **Strategic corporate command hubs:** GCCs are specialised global centres that now guide corporate strategy, innovation, and execution, not just operational support.

2. **End-to-end enterprise responsibility:** These centres manage complete product lifecycles from conceptualisation and architecture to global deployment and customer feedback.

3. **Drivers of innovation and competitiveness:** GCCs enable enterprise resilience, technological acceleration, and global competitiveness through high-end research and development.

4. **Extended headquarters with leadership roles:** They host global leadership functions and act as cognitive command hubs for breakthroughs across advanced technologies.

Evolution of Global Capability Centres (GCCs)

Four-wave transformation to GCC 4.0: India's GCC ecosystem has evolved through **four distinct waves**, culminating in the current innovation-led **GCC 4.0 era**.

Phase 1 — Labour arbitrage and cost efficiency: Early centres focused mainly on routine IT and business processes to reduce operational costs.

Phase 2 — Expanded enterprise support capability: Centres gradually handled broader organisational functions beyond routine processing, strengthening operational integration.

Phase 3 — Strategic integration and product ownership: GCCs shifted decisively toward **end-to-end product ownership**, managing design, architecture, and execution.

Phase 4 — Innovation leadership and enterprise strategy:

• Today's centres lead global strategy, high-end R&D, and proprietary intellectual property creation.

• **Enterprise-scale AI adoption as defining feature:** Nearly **58% of GCCs are investing heavily in Agentic AI**, enabling autonomous reasoning and execution of complex enterprise tasks.

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• **Core position in global value chains:** GCCs have become indispensable nodes that shape corporate futures rather than merely support them.

Benefits of Global Capability Centres (GCCs)

1. Strategic advantages for multinational corporations

• **Unmatched talent scale and capacity:** India hosts over **1,800 GCCs employing nearly two million professionals**, providing unparalleled access to skilled talent.

• **Continuous global innovation cycles:** The **follow-the-sun model** (work continues 24 hours a day across different time zones) enables faster product development and round-the-clock operations.

• **Centres of Excellence for core functions:** GCCs centralise finance, legal, and human resources in high-skill, high-efficiency environments.

• **Leadership in frontier research domains:** They drive advanced R&D in **quantum computing, semiconductor design, and Agentic AI**.

• **Deep technical execution capability:** Many GCCs now possess greater technical depth and execution power than traditional headquarters.

2. Economic and social gains for India

• **Creation of high-value employment:** GCC roles are intellectually demanding and offer significantly higher compensation than traditional service-sector jobs.

• **Emergence of a global professional class:** The ecosystem is creating a new workforce with advanced global capabilities.

• **Regional economic expansion beyond metros:** Growth is spreading to **Tier-II and Tier-III cities like Coimbatore, Indore, and Kochi**.

• **Reduced pressure on major metropolitan centres:** Expansion beyond Bengaluru and Hyderabad reduces urban infrastructure strain.

• **Local economic multiplier effects:** Real estate, infrastructure, and retail sectors are expanding rapidly in emerging GCC locations.

Emerging Risks and Structural Challenges

1. Talent shortages and cost pressures

• **Severe deep-tech skill mismatch:** Demand for AI security, cloud architecture, and quantum-resistant cryptography far exceeds supply.

• **Rising wage inflation risk:** Intense competition for specialised talent may weaken the cost advantage for multinational corporations.

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2. Cybersecurity and data governance risks

- **High-value cyber-attack exposure:** GCCs manage critical global data and are prime targets for state-sponsored attacks.

- **Strict regulatory compliance burden:** The **Digital Personal Data Protection Act** requires flawless cybersecurity governance.

- **Escalating operational costs:** Cybersecurity has become the most expensive mandate as India handles **13.7% of global cyber-attack incidents**.

3. Tax and regulatory uncertainty

- **Reduced tax arbitrage advantage:** The **OECD Global Minimum Tax (15%)** reduces the tax benefits that previously attracted multinational corporations.

- **Safe Harbour markup dispute:** India's **24% markup for software R&D under Safe Harbour rules** remains a key fiscal concern for global firms.

- **Fiscal predictability as a board-level concern:** Changing global tax rules are increasing uncertainty and affecting long-term investment planning.

4. Geopolitical and investment risks

- **Protectionism and reshoring pressures:** United States tariff volatility and data reshoring policies may affect global investment flows.

- **Digital sovereignty constraints:** Western efforts to localise data operations could slow new GCC expansion in India.

Way forward

1. **Active policy facilitation:** Policymakers must shift from regulation to enabling growth and investment in GCC expansion.

2. **Single-Window clearance mechanism:** A unified approval system can simplify entry and speed up establishment of new GCCs.

3. **Regulatory framework harmonisation:** SEZ, STPI, and IT policies should align to ensure coherence, stability, and clarity.

4. **Stable taxation and transfer pricing:** Rationalised norms and R&D tax safe harbours are needed to ensure fiscal predictability.

5. **Industry–academia skill partnerships:** Joint curriculum, research collaboration, and flexible skilling models can close deep-tech talent gaps.

6. **Regional expansion and talent hubs:** Strengthening Tier-II and Tier-III cities can distribute growth and unlock new talent pools.

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7. **Business-ready physical and digital infrastructure:** Plug-and-play offices, reliable utilities, transport, and strong digital networks are essential for global competitiveness.

8. **Integrated national GCC growth framework:** Policy must focus on talent development, infrastructure readiness, city competitiveness, and innovation ecosystems.

Conclusion

India's GCC transformation reflects a structural shift from operational support to global strategic leadership. These centres now drive innovation, employment, and regional development while anchoring India firmly in global value chains. Sustaining this momentum requires proactive policy execution, talent development, fiscal certainty, and strong cybersecurity. With coordinated effort, India can secure its position as the world's innovation nerve centre.

Question for practice:

Discuss how India has transformed from the world's back office into a global brain trust through the rise of Global Capability Centres (GCCs), and examine their benefits, challenges, and policy requirements.

Source: The Hindu

Rethinking tribal women's inheritance rights

Source: The post **"Rethinking tribal women's inheritance rights"** has been created, based on **"Rethinking tribal women's inheritance rights"** published in **"The Hindu" on 24th February 2026.**

UPSC Syllabus: GS Paper-2- Governance

Context: The recent judgment of the Supreme Court of India in Nawang v. Bahadur clarified that the **Hindu Succession Act, 1956 does not apply to Scheduled Tribes.** The judgment has revived debate on the inheritance rights of tribal women because many tribal customary laws deny equal property rights to women.

Background

1. Most tribal customary inheritance systems give property rights mainly to male members of the family.
2. Section 2(2) of the Hindu Succession Act excludes Scheduled Tribes unless Parliament decides otherwise.
3. Earlier courts **sometimes allowed inheritance rights when tribal people adopted Hindu customs,** which created confusion.
4. This situation forced tribal women to choose between preserving tribal identity and gaining legal rights.

Supreme Court Ruling

1. The Supreme Court held that **the Hindu Succession Act cannot be applied to Scheduled Tribes in any situation.**
2. The Court stated that **only Parliament has the power to extend** such laws to tribal communities.
3. The Court also said that **High Courts cannot direct legislative changes in inheritance laws.**
4. The judgment **reaffirmed constitutional protection for tribal identity** and autonomy.

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Major Issues

1. Gender Inequality: Many tribal women are **denied equal inheritance rights under customary laws.** This exclusion goes against **constitutional principles of equality and justice.**

2. Legal Uncertainty: Earlier decisions granting rights after "Hinduisation" created inconsistent legal outcomes. Tribal women **were unsure of their rights when property disputes arose.**

3. Identity vs Rights Conflict: Tribal women **sometimes had to abandon customary identity to claim inheritance.** This process **weakened tribal culture and autonomy.**

4. Customary Law vs Constitution: Some customary laws discriminate against women. There is a **conflict between respecting tradition and ensuring gender justice.**

Related Judicial Observation:
1. In **Ram Charan v. Sukhram, the Supreme Court observed that excluding daughters from ancestral property violates equality rights.**
2. This shows growing judicial concern about gender discrimination in inheritance.

Way Forward

1. Parliament should create a special inheritance law for the Scheduled Tribes. Such a law should ensure gender equality while respecting tribal customs.
2. Codifying customary laws with reforms, as done in Mizoram, can serve as a model.
3. The government should consult tribal leaders, women's organisations, and legal experts before drafting laws.
4. The new law should protect both tribal identity and women's constitutional rights.
5. Legal awareness programmes should inform tribal women about their rights.
6. Legal aid should be provided to help tribal women fight inheritance disputes.

Conclusion: The Supreme Court judgment has clarified the legal position but has exposed gender inequality in tribal inheritance systems. A balanced legislative solution is required to ensure equal rights for tribal women without harming indigenous cultural traditions.

Question: Customary tribal laws often conflict with constitutional guarantees of gender equality. Discuss in the context of tribal women's inheritance rights.

Source: The Hindu

India's Power Grid & Data Centre Boom: Can It Meet AI Demand?

Source: The post **"India's Power Grid & Data Centre Boom: Can It Meet AI Demand?"** has been created, based on "Can India's power system keep up with the explosion in data centres?" published in **"Indian Express"** on 24th February 2026.

UPSC Syllabus: GS Paper-3- Economy

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Context: The rise of AI-based computing is driving a surge in electricity demand due to rapid expansion of data centres. India's installed data centre capacity is about **1.2 GW** and may increase fourfold by 2030. According to Grid India officials, such expansion could create a paradigm shift in grid planning and operations.

Reasons behind Data centres creating power challenges

1. Large and Complex Electricity Loads

- Data centres are high-intensity loads requiring transmission-level connectivity.
- Hyperscale facilities can require nearly 1 GW of power each.
- They are different from traditional industrial loads because they operate continuously.

2. Highly Dynamic and Variable Demand

- Data centre loads are "spiky" and unpredictable due to AI workloads.
- Sudden isolation from the grid can cause disturbances and voltage instability.
- Forecasting demand becomes difficult.

3. Strain on Transmission Infrastructure

- Massive power demand requires high-voltage substations.
- Poor planning could lead to chaotic infrastructure development and higher tariffs.
- Central and State Transmission Utilities need advance planning.

4. Resource Adequacy Concerns

- Power systems must provide not only electricity but also reserves and balancing capacity.
- Data centres must contribute to resource adequacy rather than rely entirely on the grid.

5. Baseload Supply Requirements: Hyperscale centres need stable, long-duration electricity supply. India's limited nuclear capacity constrains baseload options.

Opportunities from Data Centre Growth

1. Boost to Renewable Energy: Renewable energy through open-access power procurement can support data centres. Pumped hydro storage and battery storage can provide round-the-clock green electricity.

2. Efficiency Innovations: Semiconductor improvements such as Intel's energy-efficient chip designs reduce power demand. Heterogeneous AI workloads can optimize energy consumption.

3. Grid Modernisation: Data centre growth can drive smart grid technologies, storage solutions, and better forecasting.

Policy and Infrastructure Solutions

1. Planned Infrastructure Development: The Central Electricity Authority should create a national plan for data centre locations. Grid expansion and substations must be pre-planned.

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2. Mandatory Captive Generation & Storage: Data centres should install on-site renewable generation or storage. Battery storage and pumped hydro should support peak demand.

3. Strengthening Resource Adequacy Rules: Regulations should ensure data centres contribute to reserves and balancing capacity. Compliance standards must evolve.

4. Diversified Energy Mix: A mix of solar, wind, storage, and stable baseload sources is needed. Nuclear power expansion could also support long-term demand.

5. Demand-Side Management: Workload scheduling and energy-efficient hardware can reduce peak demand.

Conclusion: AI-driven data centre expansion presents both an energy challenge and an opportunity. With proper planning, renewable integration, storage adoption, and regulatory reforms, India can meet rising demand while ensuring grid stability and sustainable growth.

Question: "The rapid growth of AI-driven data centres is emerging as a major challenge for India's power system." Examine the issues involved and suggest measures to ensure energy security and grid stability.

Source: Indian Express

Artificial Intelligence (AI) Transforming Rural India

UPSC Syllabus: Gs Paper 3- Science and Technology- developments and their applications and effects in everyday life.

Introduction

Artificial Intelligence (AI) refers to the ability of machines to perform tasks such as learning, reasoning, and decision-making. India, AI is being developed as a **public good to drive inclusive rural transformation**. It is moving from pilot projects to large-scale use through the **IndiaAI Mission and Digital India**. The focus is on strengthening rural governance, service delivery, and participation while ensuring fairness, transparency, and social inclusion.

Why is there a need for Artificial Intelligence (AI) to transform rural India?

1. **Bridging Rural Infrastructure Gaps:** Rural areas face gaps in roads, healthcare, education, and sanitation. AI helps identify underserved villages and plan targeted development using data from Mission Antyodaya, PMGSY, Census, and satellite mapping.

2. **Improving Service Delivery:** Many rural regions lack timely access to welfare services. AI supports data-driven governance and improves last-mile delivery across agriculture, healthcare, education, and local administration.

3. **Strengthening Participatory Governance:** Manual documentation and planning often reduce efficiency. AI-based systems improve transparency, reduce bias, and support evidence-based decision-making in Panchayats.

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4. **Optimising Resource Allocation:** Limited public funds require better targeting. AI-based predictive models help prioritise investments in roads, electrification, and infrastructure based on population and economic trends.

5. **Reducing Linguistic and Digital Barriers:** Many rural citizens face language and literacy challenges. AI-powered multilingual tools ensure access to digital services in local languages.

National Strategy and Governance Framework for Inclusive AI

1. **National Strategy for Artificial Intelligence (2018):**

> • **Launched by NITI Aayog**, it promotes **AI for All**. It focuses on improving access, affordability, and quality in agriculture, healthcare, and education, especially in rural India.

> • **Human Augmentation Approach:** The strategy supports frontline workers instead of replacing them. AI works as a support system for farmers, teachers, health workers, and administrators.

2. **India AI Governance Guidelines (2025):**

> • **Issued by MeitY,** the guidelines focus on fairness, accountability, transparency, and India-specific risk assessment in welfare systems.

> • **The framework comprises four key components:**

>> ● **Seven guiding principles (Sutras)** for ethical and responsible AI.
>> ● **Key recommendations** across six pillars of AI governance.
>> ● An **action plan** mapped to short, medium, and long-term timelines.
>> ● **Practical guidelines** for industry, developers, and regulators to ensure transparent and accountable AI deployment.

> • **Digital Public Infrastructure Integration:** Privacy, interoperability, and accountability are embedded by design. A whole-of-government approach strengthens grievance redressal and institutional capacity.

AI in Rural e-Governance and Local Administration

1. **SabhaSaar for Gram Sabha Documentation:**

> • SabhaSaar is an **AI-enabled tool that generates structured minutes of Gram Sabha and Panchayat meetings** from audio or video inputs.

> • Integrated with BHASHINI (an AI-enabled National Mission on Natural Language Translation platform that provides multilingual translation and voice-based services), it supports 14 Indian languages, making documentation unbiased and accessible across diverse rural communities.

2. **eGramSwaraj Digital Platform:**

> • Launched in April 2020 under the e-Panchayat Mission Mode Project, eGramSwaraj brings planning, budgeting, accounting, monitoring, asset management, and payments onto a single digital platform.

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• In FY 2024–25, it onboarded over **2.53 lakh gram panchayats, 6,409 block panchayats, and 650 Zila panchayats**, showing wide adoption.

3. **Gram Manchitra for GIS Planning:** It supports mapping of assets and integration of spatial data into Gram Panchayat Development Plans (**GPDPs)**.

4. AIKosh as Data Infrastructure: It serves as a national repository of AI datasets and models to advance public-sector innovation. It consolidates data from governmental and non-governmental sources and offers ready-to-deploy AI models across diverse sectors..

AI Infrastructure and Sectoral Integration in Rural India

1. **BhuPRAHARI for Asset Monitoring:** Launched in May 2025 by the Ministry of Rural Development with IIT Delhi, it uses AI and geospatial tools to monitor MGNREGA and VB-G RAM G assets through satellite and ground data.

2. **Digital ShramSetu Mission:** It deploys AI in the informal sector to improve service delivery and livelihood support for rural workers with regulatory alignment.

3. **AI in Agriculture:** AI supports weather forecasting, pest detection, and irrigation planning. **Kisan e-Mitra** provides scheme-related information, while **Crop Health Monitoring and the National Pest Surveillance System generate real-time advisories.**

4. **AI in Education and Skilling:**

• **NCERT's DIKSHA platform** integrates AI-enabled keyword-based video search and read-aloud tools to improve accessibility, especially for students with visual impairments and diverse learning needs.

• **YUVAI** equips students of Classes VIII–XII with foundational AI and socio-technical skills through experiential learning across sectors like agriculture, health, and rural development.

5. **State-Level Innovation – Suman Sakhi Chatbot:** Launched under the National Health Mission in Madhya Pradesh, it provides maternal and newborn health information via WhatsApp and supports frontline workers like ASHAs and ANMs.

AI for Language Inclusion and Multilingual Governance

1. **BHASHINI Platform:**

• Launched in July 2022, it provides translation, speech-to-text, and voice interfaces in more than 36 languages.

• It is integrated with over 23 government services and supports over 350 AI language models, with more than one million downloads as of October 2025.

2. **BHASHINI Sanchalan:** It strengthens multilingual governance by integrating voice-first interfaces into public systems and improving domain-specific translation accuracy.

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3. **Bharat Gen Multilingual Model:** Launched in June 2025, Bharat Gen supports 22 Indian languages and integrates text, speech, and document-vision capabilities for public applications.

4. **Adi Vaani for Tribal Communities:** Developed under the Adi Karmayogi framework, it enables access to governance, healthcare, and education in tribal languages and supports language preservation.

What Should Be Done?

1. **Scale from Pilot to System-Wide Implementation:** The India–AI Impact Summit 2026 signals expansion of proven AI use cases across rural sectors under the IndiaAI Mission and Digital India.

2. **Strengthen Data-Driven Infrastructure Planning:** AI should use PMGSY, Census, Mission Antyodaya, and satellite data for underserved village detection and predictive infrastructure planning.

3. **Promote Predictive and Geospatial Solutions:** Time-series modelling, regression tools, and remote sensing should guide prioritisation of roads, electrification, and healthcare investments.

4. **Ensure Ethical and Inclusive Deployment:** Governance safeguards must remain central to prevent bias, exclusion, and opaque decision-making in welfare delivery.

Conclusion

Artificial Intelligence is becoming a **foundational pillar of rural transformation** in India. It strengthens governance, infrastructure planning, agriculture, healthcare, education, and language inclusion. With strategic vision, governance safeguards, and Digital Public Infrastructure, AI augments human capacity rather than replaces it. Responsible and inclusive deployment will remain central to building equitable and resilient rural development systems.

Question for practice:

Discuss how Artificial Intelligence (AI) is transforming rural India through governance, infrastructure, and sectoral initiatives.

Source: PIB

The Quiet Crisis of Adolescent Mental Health in India

UPSC Syllabus: Gs Paper 2 -Issues relating to development and management of Social Sector/Services relating to Health, Education, Human Resources.

Introduction

The recent deaths of three adolescent girls in Ghaziabad, Uttar Pradesh, brought national attention to child and adolescent mental health. Such incidents should not be seen as isolated tragedies. They point to deeper structural concerns. Emotional disorders are appearing at younger ages, and digital overexposure is increasing vulnerability. Schools often fail to detect early warning signs, and specialist care remains limited, which together widen this public health challenge.

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Current Status of Mental Health Burden Among Children in India

1. **Early Emergence of Disorders:** Emotional and behavioural problems can appear as early as four or five years of age. Anxiety, depression, attention disorders and behavioural disturbances are increasingly seen in young children.

2. **Rising Prevalence:** National survey findings show that **7–10% of adolescents** in India have diagnosable mental health conditions. Among school-aged children, **5–7% live with** Attention Deficit Hyperactivity Disorder (**ADHD**).

3. **Growing Comorbidity:** Multiple conditions now appear together. ADHD often coexists with anxiety, and depression is frequently linked with compulsive digital use or learning difficulties.

4. **Dismissed Warning Signs:** Withdrawal, impulsivity and sudden behaviour changes are often ignored. This delay increases academic stress, social isolation and long-term emotional damage.

Causes of Rising Mental Health Burden Among Children

1. **Impact of Early Trauma and Stress:** Neglect, loss and chronic stress disrupt emotional and cognitive growth. These disruptions often resurface more intensely during adolescence.

2. **Rapid Digital Expansion:** More than **800 million Indians** use smartphones and affordable Internet services. Many children are active users, and digital exposure now begins early.

3. **Blurring of Daily Boundaries:** Education, communication and entertainment operate on the same device. This reduces offline engagement and weakens natural social interaction.

4. **Clinical Concerns Linked to Screen Use:** Internet addiction is marked by loss of control, irritability, sleep disruption and withdrawal. Excessive screen use does not cause ADHD or autism, but it worsens symptoms and delays recognition.

5. **Academic-Centred School Culture:** Examinations and rankings dominate school systems. Emotional regulation and stress management receive limited structured attention.

Concerns Emerging from the Crisis

1. **Severe Specialist Shortage:** India has **fewer than 10,000 psychiatrists** for a population exceeding 1.4 billion. Only a small proportion specialise in child mental health, and shortages of psychologists and psychiatric social workers deepen the gap.

2. **Fragmented and Delayed Care:** Families often manage complex conditions alone. Help is usually sought during crisis stages rather than at early warning signs.

3. **Weak Institutional Detection:** Paediatric consultations largely focus on physical growth. Emotional wellbeing, sleep patterns and screen use are not routinely examined.

4. **Gap Between Research and Practice:** India's research base on child mental health and digital behaviour has grown steadily. However, translation into routine school and clinical practice remains slow.

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5. **Persistent Stigma:** Fear of labelling and judgement prevents early care. Child psychiatry carries strong misunderstanding and hesitation.

6. **Unequal Digital Health Access:** Telepsychiatry has expanded reach, yet access remains uneven across underserved families.

Government Initiatives

1. **Policy Recognition:** The **Economic Survey 2025–26** acknowledged rising mental health challenges among young people and proposed preventive strategies.

2. **Existing National Platforms:** The **National Mental Health Programme**, school health services under **Ayushman Bharat Health and Wellness Centres**, and tele-mental health initiatives provide a foundation for action.

3. **State-Level Digital Regulation Efforts:** Some States are considering regulatory limits on adolescent social media use. These efforts draw from global precedents and aim to balance protection with awareness.

4. **Implementation Gaps:** Despite platforms and policy acknowledgement, routine school screening, structured referral pathways and targeted child-focused funding remain limited.

What Should Be Done?

1. **Routine School-Based Screening:** Schools should integrate regular emotional and behavioural screening. Early detection can prevent severe outcomes.

2. **Structured Professional Training:** Teachers, counsellors and frontline workers must receive training to recognise warning signs and Internet-related harms. This becomes crucial in a system with limited child specialists.

3. **Strengthened Referral Systems:** Clear coordination between schools, paediatricians and mental health professionals is needed for timely support.

4. **Trauma-Informed Parenting:** Parents should observe changes in sleep, mood and social behaviour. Listening without judgement and seeking help early can alter developmental paths.

5. **Community Support Networks:** Parent support groups reduce isolation and normalise help-seeking. Adolescent peer groups build resilience and coping skills through shared learning.

6. **Clear Digital Guidelines in Schools:** Schools must set boundaries for healthy screen use. Human interaction should not be displaced during key developmental stages.

7. **Dedicated Funding and Normalised Dialogue:** Child mental health requires earmarked funding. Open conversations in families, schools and health systems must replace silence and stigma.

Conclusion

Child and adolescent mental health is central to India's long-term social and economic stability. Rising disorders, digital overexposure and weak early detection demand coordinated action. Strengthening families,

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schools and health systems is urgent. Childhood must promote wellbeing, resilience and connection. Delayed response will lead to deeper social and developmental costs in the future.

Question for practice:

Examine the structural factors contributing to the rising burden of child and adolescent mental health problems in India, and evaluate the adequacy of institutional and policy responses in addressing this challenge.

Source: The Hindu

Export Promotion Mission: Enabling MSMEs in Global Trade

Source: The post **"Export Promotion Mission: Enabling MSMEs in Global Trade"** has been created, based on **"Export Promotion Mission: Enabling MSMEs in Global Trade"** published in **"PIB" on 25th February 2026.**

UPSC Syllabus: GS Paper-3-Economy

Context: The **Export Promotion Mission (EPM)** is a flagship initiative approved in November 2025 to strengthen India's export ecosystem. The Mission focuses on MSMEs, first-time exporters, and labour-intensive sectors to expand global market access. The government has allocated ₹25,060 crore for the period FY 2025–26 to FY 2030–31 to enhance export competitiveness.

Objectives of the Mission

1. The Mission **aims to improve access** to affordable and diversified trade finance for MSMEs.
2. It also aims to strengthen export branding, logistics infrastructure, and overseas warehousing.
3. It seeks to help exporters comply with international quality, technical, and sustainability standards.
4. The Mission also seeks to expand market access and provide trade intelligence support.
5. It encourages broader participation of MSMEs, including cross-border e-commerce exports.

Structure of EPM

1. The Mission is implemented through two sub-schemes called **Niryat Protsahan** and **Niryat Disha**.
2. Niryat Protsahan focuses on financial enablers such as trade finance and credit support.
3. Niryat Disha focuses on non-financial support such as compliance, logistics, and market access.

Key Features of EPM

1. The Mission provides stage-wise support across the export journey from market exploration to post-shipment activities.
2. It provides support for market analysis, export finance, trade compliance, logistics, overseas warehousing, and buyer connectivity.
3. The Mission adopts a whole-of-government approach by integrating policy support, finance, logistics, and market linkages.

Major Interventions under EPM

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I. Financial Enablers under Niryat Protsahan

1. The Mission provides support for export factoring to unlock working capital and manage payment risk.
2. It offers credit assistance to e-commerce exporters through the **Export-Import Bank of India**.
3. It supports exporters entering new markets through shared-risk and credit instruments.
4. It provides interest subvention on pre-shipment and post-shipment export credit.
5. It facilitates collateral-free export credit through credit guarantee support.

II. Non-Financial Enablers under Niryat Disha

1. TRACE provides financial assistance for testing, inspection, and certification required for global markets.
2. LIFT provides financial support to reduce logistics and transportation costs.
3. INSIGHT provides trade intelligence, training, research, and capacity building.
4. FLOW supports overseas warehousing, fulfilment, and e-commerce export hubs.
5. MAS supports buyer-seller meets, trade fairs, and trade delegations.

Significance of the Mission

1. The Mission reduces export finance constraints faced by MSMEs.
2. It improves compliance readiness for international markets.
3. It mitigates logistics disadvantages faced by exporters in hinterland regions.
4. It strengthens overseas market access and distribution networks.
5. The Mission promotes inclusive and export-led growth.

Challenges of EPM

1. The Mission is thoughtfully structured, but its impact will depend on effective execution by both government and industry.
2. The annual budget allocation of ₹2,250 crore for FY 2025–26 is smaller than the total outlay, which may slow implementation.
3. Exporters continue to face uneven access to export credit and rising compliance costs due to non-tariff measures in foreign markets.
4. Many exporters face documentation gaps and weak overseas distribution networks that reduce competitiveness.
5. Exporters must improve their own compliance systems, financing options, and digital adoption to benefit from the Mission.
6. Digital trade reforms requiring electronic documentation may be difficult for smaller firms to adopt.
7. Long-term export competitiveness depends on productivity gains, digital readiness, and better use of data and technology.

Way Forward

1. The government should ensure the **timely and efficient implementation of schemes** to translate policy intent into real export growth.
2. Exporters **should use consultation opportunities to provide feedback to policymakers** and improve scheme design.
3. MSMEs should strengthen their internal compliance systems and adopt global quality standards.

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4. Exporters should diversify financing options and use available trade finance tools such as factoring and credit guarantees.
5. Firms should adopt digital documentation practices to benefit from the proposed digital trade reforms.
6. Exporters should build reliable overseas market linkages and distribution networks.
7. The government and industry should focus on productivity improvements, digital adoption, and data-driven supply chains to ensure sustained export competitiveness.

Conclusion: The Export Promotion Mission provides an integrated framework combining finance, logistics, compliance, and market access support. The Mission has strong design potential to expand MSME participation in global trade. However, its success will depend on disciplined execution, exporter preparedness, and sustained improvements in competitiveness.

Question: Discuss the objectives and key features of the Export Promotion Mission (EPM). Examine its significance for MSMEs and the challenges in its implementation.

Source: PIB

Tourism and the Architecture of Growth

Source: The post **"Tourism and the Architecture of Growth"** has been created, based on **"Tourism and the Architecture of Growth"** published in **"PIB" on 25th February 2026.**

UPSC Syllabus: GS Paper-3-Economy

Context: Tourism is a key sector of the Indian economy because it generates employment, earns foreign exchange, and promotes balanced regional development. According to the India Tourism Data Compendium 2025, tourism contributes 5.22% to GDP and supports 13.34% of total employment. Recognising its multiplier effect, the Union Budget 2026–27 has proposed several initiatives to strengthen tourism infrastructure, skills, connectivity, and destination competitiveness.

Major Budget 2026–27 Tourism Initiatives

1. Thematic and Destination-Based Tourism Development

1. The government has proposed preservation of temples and monasteries and creation of pilgrimage centres in North-East states such as Arunachal Pradesh, Sikkim, Assam, Manipur, Mizoram, and Tripura.
2. A new scheme for development of Buddhist Circuits in the North-East will strengthen tourism infrastructure at important spiritual sites.
3. The initiative builds on earlier programmes like **Swadesh Darshan Scheme** and its upgraded version **Swadesh Darshan 2.0**.

2. Eco-Tourism and Connectivity

1. The Budget proposes eco-trails in Himachal Pradesh, Uttarakhand, Jammu & Kashmir, Araku Valley, and Podhigai Malai.
2. Turtle trails in Odisha, Karnataka, and Kerala and bird-watching trails at Pulicat Lake will promote biodiversity-based tourism.

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3. Expansion of rail and regional connectivity and provision of 4,000 electric buses in Purvodaya states will improve tourist mobility.

3. Global Positioning and Eco-Tourism Diplomacy

1. India will host the first Global Big Cat Summit in 2026, bringing together leaders from 95 countries.
2. This builds on India's leadership in wildlife conservation through the **International Big Cat Alliance**, which promotes global cooperation for big cat conservation.
3. The initiative will enhance India's reputation in eco-tourism diplomacy.

4. Institutional and Skill Development

1. The Budget proposes upgrading the National Council for Hotel Management into a National Institute of Hospitality to address skill gaps.
2. A pilot programme will train 10,000 tourist guides at iconic destinations through partnerships with leading institutions.
3. These initiatives complement programmes like Capacity Building for Service Providers and Incredible India Tourist Facilitator schemes.

5. Digital and Heritage Infrastructure

1. The Budget proposes creating a National Destination Digital Knowledge Grid to document heritage and cultural assets.
2. Fifteen archaeological sites such as Lothal, Dholavira, Rakhigarhi, Sarnath, Hastinapur, and Leh Palace will be developed into experiential destinations.
3. These initiatives will strengthen heritage conservation and visitor engagement.

6. Medical Tourism Development

1. The Budget proposes five regional medical hubs to promote India as a global medical tourism destination.
2. These hubs will integrate advanced healthcare, AYUSH centres, diagnostics, and rehabilitation facilities.

7. Regional Development through Tourism

1. Five tourism destinations will be developed in Purvodaya states such as Bihar, Jharkhand, West Bengal, Odisha, and Andhra Pradesh.
2. Improved transport connectivity and tourism infrastructure will promote regional growth and local entrepreneurship.

Significance of These Initiatives

1. Tourism initiatives will generate employment across hospitality, transport, handicrafts, and allied sectors.
2. Improved connectivity and infrastructure will integrate remote regions into the tourism economy.
3. Heritage conservation and eco-tourism will promote sustainable development.
4. Medical tourism and global events will enhance foreign exchange earnings.
5. Tourism-led development will support inclusive growth and regional balance.

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Challenges

1. Tourism infrastructure development requires effective coordination between central and state governments, which may be difficult in practice.
2. Preservation of heritage and ecological sites must balance tourism growth with environmental sustainability.
3. Skill development initiatives require consistent quality training and certification standards.
4. Remote regions may face connectivity gaps despite planned investments.
5. Successful medical tourism hubs require strong healthcare infrastructure and international accreditation.
6. Implementation delays or funding constraints could reduce the impact of tourism initiatives.

Way Forward

1. The government should ensure coordinated implementation among ministries, states, and local bodies.
2. Tourism development should follow sustainable practices to protect biodiversity and heritage assets.
3. Skill training programmes should be aligned with industry needs and international standards.
4. Digital tools like the National Destination Digital Knowledge Grid should be used for data-driven planning and promotion.
5. Community participation should be encouraged to ensure livelihood benefits for local populations.
6. Infrastructure investments in transport and hospitality should be completed on time.
7. India should promote branding campaigns to position itself as a global tourism and medical tourism destination.

Conclusion

The Union Budget 2026–27 positions tourism as a major driver of economic growth, employment generation, and regional development. The focus on infrastructure, heritage, eco-tourism, skills, and digital platforms creates a comprehensive framework for tourism expansion. With effective implementation and sustainable practices, tourism can become a key pillar of India's socio-economic growth.

Question: "Tourism has a strong multiplier effect on employment, regional development, and foreign exchange earnings." In light of Union Budget 2026–27 initiatives, discuss how tourism can act as an engine of economic growth in India.

Source: PIB

India's Trade Strategy in a Multipolar World

UPSC Syllabus: Gs Paper 2- International Relation .

Introduction

India's trade strategy in a multipolar world is shaped by rising exports, ambitious free trade agreements, and a clear goal of reaching **$2 trillion exports by 2030** under the 2023 Foreign Trade Policy. In 2025, total exports reached **$825.25 billion with 6.05% growth**. Trade is now linked with strategic autonomy, supply chains, and national security in a fragmented global order.

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The Shift in India's Trade Approach

1. **From cautious FTAs to active engagement:** For many years, India signed agreements mainly with similar developing economies. Now it pursues comprehensive FTAs with major developed economies that were earlier beyond reach.

2. **Expansion of FTA coverage:** India's FTA network is projected to cover **71% of its export basket by 2026**, up from **22% in 2019**, showing a decisive policy shift.

3. **Integration with advanced markets:** Agreements with Australia, the EU, the UAE, the U.K., and the U.S. show a move from regional focus to deeper integration with high-value economies.

4. **Balancing domestic strength and global openness:** After opting out of RCEP, India adopted a calibrated strategy by boosting domestic manufacturing through production-linked incentives and infrastructure expansion while deepening global integration.

Major Trade Agreements as Strategic Milestones

1. **India–EU Free Trade Agreement:**

   • Signed on January 27, 2026, it creates a free trade zone of nearly two billion people and reduces or eliminates tariffs on over **90% of traded goods**.

   • **Sectoral gains under the EU deal:** It boosts textiles, leather, pharmaceuticals, chemicals, and marine products, enhances regulatory cooperation, lowers production costs through easier access to advanced machinery, and promotes digital trade and investor confidence.

   • **Improved competitiveness and MSME integration:** The EU agreement strengthens India's position against Bangladesh and Vietnam and integrates MSMEs into Global Value Chains.

2. **U.S. interim reciprocal trade framework:**

   • Signed in February 2026, it reduces tariffs progressively and advances negotiations toward a broader Bilateral Trade Agreement.

   • **Strategic sector cooperation with the U.S.:** Collaboration in rare earths and semiconductors supports high-technology manufacturing and strengthens India's role as a reliable electronics and semiconductor hub.

3. **Diversification and flexibility:** These agreements reduce overdependence on specific markets and enhance strategic and economic flexibility.

Trade in the Context of Global Transformation

1. **Blurring of trade and national security:** Economic coercion, technological exclusion, and supply chain weaponisation now directly affect sovereignty.

2. **Integration and fragmentation together:** Sanctions, export controls, industrial regulations, and technology limits increasingly shape cross-border flows.

3. **Power through system control:** Influence depends on control over payment systems, logistics networks, standards bodies, and compliance infrastructure, not only trade volume.

4. **Weakening of multilateral discipline:** The erosion of global trade governance shows that rules alone cannot constrain major powers.

5. **Chokepoints as pressure tools:** Financial sanctions, semiconductor export restrictions, and shipping or insurance disruptions show how economic access can be limited without military conflict.

Strategic Dimensions of India's Trade Policy

1. **Preferential access to high-demand markets:** Engagement with advanced economies strengthens export potential and supports labour-intensive sectors and MSMEs.

2. **Integration into global supply chains:** Reduction of barriers on exports and intermediate imports improves competitiveness in technology, electronics, pharmaceuticals, and services.

3. **Export diversification across continents:** Agreements across regions enhance economic resilience and reduce vulnerability to market concentration.

4. **Enhanced diplomatic leverage:** Deeper economic interdependence strengthens India's voice in global economic governance and trade norm-setting.

Way Forward

1. **Building platform power:** India must influence the systems and standards that govern trade to reduce structural vulnerability.

2. **Focus on operational systems:** Priority should be given to compliance systems, logistics coordination, payment infrastructure, and trusted digital verification frameworks.

3. **Reimagining services and digital trade:** India should move from executing services to building trusted systems such as digital identity, secure payments, and automated compliance.

4. **Institutional reforms and speed:** Integrated doctrine, mission-driven governance, predictable data rules, standards participation, modular system export, and faster institutional response are necessary to strengthen long-term resilience.

Conclusion

India's trade strategy combines export expansion, diversification, and strategic engagement with major economies. In a fragmented global order, sovereignty depends on resilience and freedom of choice. By deepening FTAs, strengthening supply chains, and building trusted trade systems, India aims to move from being a large market to becoming a rule-shaping and system-influencing power in global commerce.

Source - The Hindu

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An Israel Visit Its Strategic, Economic, Regional Impact

UPSC Syllabus: Gs Paper 2 -International Relation

Introduction

West Asia is facing rising tensions, including a large American military buildup in the Persian Gulf, Iran's defiance, and fragile peace in Gaza since October 2025. Regional fault lines are also pulling countries like the UAE and Saudi Arabia into opposing blocs. In this uncertain situation, Prime Minister Narendra Modi's February 25–26, 2026 visit to Israel gains strategic, economic, and geopolitical importance.

Evolution of India–Israel Relationship

1. **From Diplomatic Ties to Strategic Partnership:** India and Israel established full diplomatic relations in 1992. The partnership deepened after Modi's historic 2017 visit, the first by an Indian Prime Minister.

2. **De-hyphenation Policy:** The 2026 visit is a standalone engagement without meeting Palestinian leadership. This reflects India's success in separating its Israel ties from the Palestine issue.

3. **Growing Strategic Convergence:** Both countries face hostile neighbourhoods and frequent terror threats. This shared security concern has shaped a strong and practical partnership.

Why Modi's Israel Visit Matters

1. Defence and Security Cooperation

• **Largest Defence Partnership:** India accounted for about **34% of Israel's total arms exports between 2020 and 2024**, according to SIPRI. Cooperation has moved from imports to joint development and technology collaboration.

• **Advanced Military Technology:** Israel has supplied UAVs, missiles, radar systems, and special forces equipment. The jointly developed **Barak-8 air and missile defence system** is a major example.

• **Future-Oriented Defence Vision:** The 2022 '**India-Israel Vision on Defence Cooperation'** and the November 2025 agreement aim to deepen cooperation in advanced systems, defence industry, and joint production.

• **Air and Missile Defence Focus:** Lessons from Operation Sindoor (May 2025) highlighted the need for a strong air and anti-drone shield under Mission 'Sudarshan Chakra'. Discussions may include co-production of the **Iron Beam 100kW laser system**.

• **Private Sector Defence Linkages:** Autonomous Guard signed a deal worth about **$1.9 million** with an Indian defence firm for advanced surveillance and sensor-based threat detection systems.

2. Technology, Innovation, and Development Partnership

• **Agricultural Transformation:** More than **35 Centres of Excellence** in India promote high-density production of fruits, vegetables, flowers, and beekeeping.

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• **Water Resource Cooperation:** MASHAV signed agreements with Haryana (June 2022) and Rajasthan (December 2024) for integrated water management and capacity building.

• **Emerging Technology Collaboration:** Artificial Intelligence is expected to become an important focus area in future bilateral innovation initiatives.

3. Trade, Investment, and Economic Expansion

• **Strong Trade Base:** Bilateral trade reached **$3.75 billion in FY 2024–25**, making India Israel's second-largest trading partner in Asia.

• **Expanding Trade Basket:** While diamonds, petroleum, and chemicals dominate, trade is expanding into electronics, communications, high-tech products, and medical equipment.

• **Investment and FTA Momentum:** A Bilateral Investment Agreement was signed in September 2025. The Terms of Reference for a Free Trade Agreement were signed in November 2025, and the visit may accelerate negotiations.

• **Infrastructure and Mobility Discussions:** Israel seeks arrangements for Indian infrastructure companies in road and port projects. It may also pursue a "human mobility" agreement to attract skilled Indian professionals.

4. People-to-People and Symbolic Engagement

• **Parliamentary Diplomacy:** Modi's address to the Knesset, an honour usually reserved for select global leaders, reflects the maturity of bilateral ties.

• **Cultural and Historical Connect:** His visit to Yad Vashem highlights shared respect for history and remembrance.

• **Diaspora and Innovation Outreach:** Interaction with the Indian Jewish community and participation in a technology exhibition strengthen social and innovation linkages beyond formal agreements.

Regional and Geopolitical Implications

1. Iran Tensions and Energy Security

• **Impact on India's Interests:** Rising Iran-U.S. tensions may affect regional stability and India's energy security. This will form an important part of discussions.

2. Gaza Peace Process and India's Role

• **Global Stabilisation Efforts:** At the February 19, 2026 Summit of the Board of Peace, over 50 countries pledged support, including **$7 billion** and troop commitments. India attended as an observer.

• **Balanced Regional Approach:** India maintains strong ties with both Israel and Gulf nations. Its recent diplomatic engagements show a careful balancing strategy.

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3. IMEC and Strategic Connectivity

- **Economic Corridor Significance:** The India-Middle East-Europe Economic Corridor (IMEC), announced at the 2023 G-20 Summit in Delhi, is strategically important for both countries.

- **Alternative to Suez Route:** With the Suez Canal vulnerable to disruptions, IMEC offers a shorter and safer transport corridor. Its success depends on lasting peace in Gaza.

4. Alliance Politics and Strategic Autonomy

- **Hexagon Proposal:** Israel proposed a regional "hexagon" alliance including India and several other nations. India does not necessarily view the region through bloc politics.

- **Independent Foreign Policy:** India's response will reflect its broader regional relationships and strategic autonomy.

Conclusion

PM Modi's visit goes beyond symbolism. It strengthens **defence cooperation, technology partnership, trade expansion, and regional engagement**. It also tests India's balancing role amid West Asian tensions. The visit shows that India and Israel are deepening a mature strategic partnership while India carefully protects its wider regional interests.

Question for practice:

Discuss the strategic, economic, and regional significance of Prime Minister Narendra Modi's 2026 visit to Israel in the context of evolving India–Israel relations and emerging West Asian geopolitical challenges.

Source: [The Hindu](#)

Large Language Models (LLMs) Training in India

Source: The post **"Large Language Models (LLMs) Training in India"** has been created, based on **"How are Indian firms training LLMs? | Explained"** published in **"The Hindu" on 26th February 2026.**

UPSC Syllabus: GS Paper-3-Science and technology

Context: Bengaluru-based **Sarvam AI** released two Large Language Models trained on 35 billion and 105 billion parameters at the AI Impact Summit in New Delhi. These models aim to improve performance in Indian languages while maintaining computational efficiency. This initiative aligns with India's broader effort under the **IndiaAI Mission** to build indigenous AI capabilities.

Training of Large Language Models (LLMs)

1. Large Language Models are trained using clusters of Graphics Processing Units (GPUs), which handle the intensive parallel computations required for deep learning.
2. The training process requires enormous datasets, most of which are scraped from the internet and are dominated by English and other globally prominent languages.

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3. The combined cost of GPUs, electricity, cooling systems, and infrastructure often runs into millions of dollars for a single training run.
4. Indian firms are focusing on building mid-sized models that balance performance and efficiency, rather than immediately attempting trillion-parameter frontier systems.
5. For instance, Sarvam AI trained its models from scratch using subsidised compute access, while **BharatGen** developed a 17-billion-parameter multilingual model for sectors such as healthcare and education.

Challenges in Training Large Language Models on Indian Soil

I. Data Scarcity
1. Indian languages are underrepresented on the internet, resulting in limited high-quality datasets for training.
2. Many LLMs rely on translating Indian-language inputs into English internally, which increases token usage and inference cost.
3. Translation-based approaches may reduce efficiency and affect performance in low-resource settings.

II. Capital Constraints

1. The acquisition and operation of high-end GPUs require substantial capital investment, which is often beyond the reach of startups.
2. Indian firms do not yet possess the financial scale of global technology giants that can absorb massive upfront costs.
3. There may be limited immediate commercial returns to justify frontier-scale model training.

III. Infrastructure Limitations

1. Access to advanced semiconductor hardware remains dependent on imports.
2. Establishing and maintaining large-scale AI data centres requires long-term strategic planning and financial commitment.

Government Support under IndiaAI Mission

1. The IndiaAI Mission has commissioned over 36,000 GPUs in domestic data centres to support AI development.
2. The government has collaborated with firms such as **Yotta** to host this infrastructure.
3. Startups and research institutions can access GPU clusters at subsidised rates for training and inference.
4. Sarvam AI received access to 4,096 GPUs, with an estimated subsidy of nearly ₹100 crore.
5. The total cost of the compute cluster is approximately ₹246 crore, and the infrastructure remains reusable for other developers.
6. The initiative seeks to promote technological sovereignty, enhance AI talent, and ensure that Indian languages receive adequate representation in AI systems.

Cost Efficiency of the Mixture of Experts (MoE) Architecture

1. In traditional dense LLMs, all parameters are activated during inference, making each query computationally expensive.

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2. The Mixture of Experts (MoE) architecture activates only a subset of parameters for any given query.
3. This selective activation reduces computational load and lowers energy consumption.
4. As a result, MoE models achieve faster inference speeds at lower operational costs.
5. Therefore, a 105-billion-parameter MoE model can be significantly cheaper to operate than a dense model with the same parameter size.

Way Forward

1. The government should expand initiatives to create high-quality, publicly available datasets in Indian languages through collaboration with academic institutions and state agencies.
2. Greater private sector participation and venture capital investment are required to sustain large-scale AI research and development.
3. India should strengthen its semiconductor manufacturing and GPU supply chain capabilities to reduce import dependence.
4. Transparent benchmarking and open evaluation of domestic models should be encouraged to build global credibility.
5. Sector-specific LLMs tailored for governance, healthcare, education, and agriculture should be prioritised to generate immediate social and economic impact.
6. Long-term public–private partnerships should be institutionalised to ensure continuity of compute infrastructure and research funding.

Conclusion: India's efforts to develop indigenous Large Language Models represent a strategic move toward digital sovereignty and technological self-reliance. Although challenges related to data availability, capital investment, and infrastructure remain significant, targeted government support through the IndiaAI Mission and the adoption of efficient architectures such as MoE have laid a strong foundation. Sustained investment, ecosystem development, and policy stability will determine India's ability to compete with global frontier AI systems.

Question: Examine how Indian firms are developing Large Language Models (LLMs). Discuss the challenges of training them in India, the role of the IndiaAI Mission, the cost advantage of Mixture of Experts architecture, and suggest the way forward.

Source: The Hindu

Carbon Capture and Utilisation Technologies

Source: The post **"Carbon Capture and Utilisation Technologies"** has been created, based on **"What are carbon capture and utilisation technologies? | Explained"** published in **"The Hindu" on 26th February 2026.**

UPSC Syllabus: GS Paper-3-Economy

Context: Carbon Capture and Utilisation (CCU) technologies are emerging as an important tool to reduce emissions from hard-to-abate sectors while creating new low-carbon industrial value chains.

About Carbon Capture and Utilisation (CCU) Technologies

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1. Carbon Capture and Utilisation (CCU) refers to a set of technologies that capture carbon dioxide (CO_2) emissions from industrial sources or directly from the atmosphere.
2. The captured CO_2 is converted into useful products such as fuels, chemicals, building materials, and polymers instead of being permanently stored underground.
3. CCU differs from Carbon Capture and Storage (CCS), where the captured carbon dioxide is injected into geological formations for long-term storage.
4. CCU aims to remove carbon from the atmosphere and reintegrate it into economic value chains.

Need of CCU for India

1. India is the world's third-largest emitter of carbon dioxide, with emissions largely coming from power generation, cement, steel, and chemical industries.
2. Many of these industries are considered "hard-to-abate" sectors because their production processes are inherently carbon-intensive.
3. Renewable energy can reduce future emissions from power generation, but it cannot fully eliminate emissions from industrial processes.
4. CCU provides a pathway to reduce industrial emissions while creating new industrial value chains.
5. CCU aligns with India's net-zero target of 2070 and its goal of building a circular and low-carbon economy.

Role of Carbon Capture and Utilisation in Reducing Carbon Dioxide Emissions

1. CCU captures CO_2 before it is released into the atmosphere, thereby reducing direct emissions from industrial sources.
2. It converts captured CO_2 into alternative fuels and materials, thereby reducing dependence on virgin fossil resources.
3. By integrating carbon into reusable products, CCU supports the principles of a circular economy.
4. When combined with green hydrogen and renewable energy, CCU can significantly reduce lifecycle emissions.

Status of India

1. The Department of Science and Technology has funded research and prepared a dedicated research and development roadmap for CCU technologies.
2. The Ministry of Petroleum and Natural Gas has presented a draft 2030 roadmap for Carbon Capture, Utilisation and Storage (CCUS), identifying potential projects.
3. **Ambuja Cements** is collaborating with IIT Bombay on an Indo-Swedish CCU pilot project to convert captured CO_2 into fuels and materials.
4. **JK Cement** is developing a CCU testbed to use captured CO_2 in lightweight concrete blocks and olefins.
5. **Organic Recycling Systems Limited** is leading India's first pilot-scale Bio-CCU platform to convert CO_2 from biogas into bio-alcohols and specialty chemicals.

Other Countries Practices

1. The European Union's **EU Bioeconomy Strategy** promotes the conversion of CO_2 into feedstocks for fuels, chemicals, and materials to advance sustainability.
2. The EU's **Circular Economy Action Plan** integrates CCU into broader circularity and climate goals.
3. **ArcelorMittal** and **Mitsubishi Heavy Industries, Ltd.** are collaborating with climate tech firm D-CRBN to convert captured CO_2 into carbon monoxide for industrial reuse in Belgium.

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4. The United States supports CCU through tax credits and financial incentives for CO_2-derived fuels and chemicals.
5. The UAE's Al Reyadah project integrates CCU with green hydrogen to produce low-carbon industrial outputs.

Risks and Challenges

1. The primary challenge is cost competitiveness, as capturing and converting CO_2 is energy-intensive and expensive.
2. Without policy incentives, CCU-derived products may not compete with cheaper fossil-based alternatives.
3. India lacks fully developed infrastructure for CO_2 transport, industrial clustering, and downstream integration.
4. There is insufficient clarity regarding standards, certification systems, and long-term market signals for CO_2-based products.
5. Investor uncertainty may slow private sector participation in large-scale deployment.

Way Forward

1. The government should introduce targeted financial incentives, including carbon pricing mechanisms and tax benefits, to improve cost competitiveness.
2. India should develop industrial clusters where CO_2 capture, transport, and utilisation facilities are co-located.
3. Clear regulatory standards and certification frameworks should be established to create market confidence.
4. Public-private partnerships should be strengthened to accelerate pilot projects into commercial-scale operations.
5. Integration of CCU with renewable energy and green hydrogen initiatives should be prioritised to maximise emissions reduction.
6. Continuous implementation of the national CCUS roadmap will be essential for achieving India's net-zero target by 2070.

Conclusion: Carbon Capture and Utilisation technologies offer India a strategic pathway to decarbonise hard-to-abate sectors while creating new industrial opportunities. Although challenges related to cost, infrastructure, and policy clarity remain, targeted implementation of roadmaps, financial incentives, and global best practices can enable India to scale up CCU and move toward a circular, low-carbon economy.

Question: What are Carbon Capture and Utilisation (CCU) technologies? How can they reduce carbon dioxide emissions? Discuss global initiatives such as the EU Bioeconomy Strategy and Circular Economy Action Plan, India's current status, challenges, and the way forward for scaling up CCU in India.

Source: The Hindu

Unpackaging the Myth of Safe Bottled Water in India

UPSC Syllabus: Gs Paper 3- Infrastructure .

Introduction

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Bottled water in India has shifted from occasional convenience to daily necessity due to declining trust in municipal water and belief in plastic-sealed safety. It is generally microbiologically safe, but scientific evidence now highlights risks from **microplastics and plastic-derived chemicals**. These invisible contaminants raise concerns about **long-term health, environmental sustainability, and regulatory gaps.** Bottled water remains essential in emergencies and areas lacking safe public supply, but growing dependence has created new safety and governance challenges.

Major Concerns Related to Bottled Water in India

1. Microplastic contamination: Microplastics, plastic particles smaller than five millimetres, are found in bottled water, making it a direct exposure source. A Nagpur study detected 72 to 212 particles per litre in all tested brands, with higher levels in locally bottled water.

2. **Widespread presence:** Studies from Mumbai and coastal Andhra Pradesh found microplastics in every tested sample. This confirms contamination across regions, brands, and supply chains.

3. **Health risk uncertainty:** Microplastics carry toxic additives and pollutants, and smaller particles may cross biological barriers. Nanoplastics remain outside detection and regulation, increasing long-term safety concerns.

4. **Chemical leaching:** Plastic bottles release antimony, phthalates, and plasticisers, especially when exposed to heat and sunlight. Such exposure commonly occurs during transport, storage, and retail display.

5. **Long-term exposure gap:** Chemicals remain within limits, but standards assess short-term exposure to individual substances. They do not address combined and long-term exposure to multiple plastic-derived contaminants.

6. **Environmental contamination:** India generates millions of tonnes of plastic waste annually, with water bottles forming a major share. Plastic waste breaks into microplastics, contaminating ecosystems and water sources, including bottled water.

Factors Responsible for Bottled Water Safety Concerns in India

1. Trust deficit: Declining trust in municipal water safety has increased dependence on bottled water. People consider plastic-sealed water safer than public supply.

2. **Regulatory limitations:** Existing regulations under FSSAI do not include testing or limits for microplastics. They also do not adequately assess long-term exposure to plastic-derived chemicals under real storage and usage conditions.

3. **Weak enforcement gaps:** State-level surveys, including those in Karnataka, have found bottled water samples that are unsafe or substandard. This shows gaps in enforcement rather than absence of regulations.

4. **Fragmented bottling structure:** The industry consists of thousands of small bottling units operating with minimal oversight. This creates uneven quality control and increases the risk of contamination.

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5. **Heat exposure:** Bottles are frequently exposed to heat and sunlight during transportation, warehousing, and retail display. Elevated temperature and ultraviolet exposure increase chemical leaching from plastic into water.

6. **Plastic waste cycle:** India generates large amounts of plastic waste, and discarded bottles break into microplastics. These particles re-enter ecosystems and water sources, contributing to contamination of bottled water supplies.

Way forward

1. **Regulatory reforms:** Safety standards should include **routine testing and limits for microplastics and plastic-derived chemicals**, which are currently not covered. This will ensure monitoring reflects real exposure risks under actual storage and usage conditions.

2. **Strengthening public water system:** Improving municipal water supply and ensuring **transparent public disclosure of water quality** can rebuild trust in monitored public systems. This will reduce excessive dependence on bottled water as a default choice.

3. **Safe usage practices:** Point-of-use filtration can help remove particulate contaminants present in water. Avoiding prolonged storage and heat exposure can reduce chemical leaching from plastic bottles.

4. **Alternative safer water access:** Increasing access to **refill stations, public water dispensing systems, and affordable household filtration** can provide reliable alternatives. This will reduce reliance on single-use bottled water.

5. **Consumer awareness:** Improving awareness about contamination risks and safe handling practices can help people make informed choices. This can encourage reduced dependence on bottled water where safe alternatives exist.

Conclusion

Bottled water in India is microbiologically safe but faces risks from **microplastics, chemical leaching, and regulatory gaps**. These arise due to weak regulation, plastic waste, poor storage, and declining trust in public water. Ensuring safe drinking water requires **stronger regulations, better enforcement, improved municipal supply, and reduced dependence on plastic bottles**, supported by accountable and transparent public water systems.

Question for practice:

Evaluate the emerging safety concerns associated with bottled water in India and discuss the regulatory and policy measures required to address them.

Source: [The Hindu](#)

Balancing Faith, Dignity and Constitutional Rights

UPSC Syllabus: Gs Paper 2- Constitution of India —historical underpinnings, evolution, features, amendments, significant provisions and basic structure.

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Introduction

The Supreme Court's 2018 judgment allowed women of all ages to enter the Sabarimala temple, leading to protests and constitutional debate. Review petitions now challenge both the verdict and the legal principles used in the decision. A nine-judge Bench will examine broader constitutional questions on religious freedom, especially how courts should resolve conflicts between religious autonomy and constitutional guarantees of dignity, equality, and individual rights.

Constitutional protection of religious freedom and its limits

1. Dual protection: The Constitution protects the individual right to practise religion and also protects the rights of religious denominations to manage their own affairs in matters of religion. This ensures recognition of both personal belief and collective religious autonomy.

2. **Constitutional limits:** These rights are not absolute and are subject to public order, morality, and health. The individual right to religious freedom is also subject to other fundamental rights, including equality and dignity.

3. **Core conflict:** The Constitution creates a balance between religious autonomy and individual rights. This balance becomes difficult when religious practices exclude individuals and affect their dignity and equal participation.

Supreme Court's Sabarimala judgment and judicial opinions

Majority ruling: The Supreme Court, by a 4:1 majority, gave the following findings:

- **No separate denomination:** The Court held that devotees of Lord Ayyappa do not constitute a separate religious denomination.

- **Violation of religious freedom:** The exclusion of women aged **10–50** was held to violate women's constitutional right to freedom of religion.

- **Rule declared unconstitutional:** The **Supreme Court struck down Rule 3(b) of the Kerala Hindu Places of Public Worship Rules, 1965**, as it violated the Constitution.

- **Violation of parent law:** The Court also held that Rule 3(b) violated **Section 3 of the parent law,** which guaranteed temple access to all classes of Hindus.

Minority view: Justice Indu Malhotra, in her dissent, gave the following findings:

- **Need for harmonisation:** She held that **fundamental rights in a secular polity must be harmonised**, and equality cannot automatically override religious freedom.

- **Protection of religious customs:** She stated that **individuals have the collective right to practise their faith according to their customs and beliefs**, which deserve constitutional protection.

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- **Essential religious practice:** She found that the **exclusion of women of a certain age was based on long-standing custom and constituted an essential religious practice**, which should not be interfered with.

Essential religious practices test and its role in judicial review

1. **Test meaning:** The essential religious practices test is used by courts to determine whether a religious practice qualifies for constitutional protection. Courts examine whether the practice is essential to the religion.

2. **Judicial authority:** This test allows courts to interpret religious doctrine and decide which practices are essential. As a result, courts determine the scope of constitutional protection for religious practices.

3. **Judicial example:** In the 1966 Swaminarayan sect case, the Court determined essential religious practices using selective references to Hindu texts. It concluded what was essential without relying on the conscience of followers.

4. **Test limitations:** The test allows courts to sit in theological judgment over religion, which is inconsistent with secular principles. It also requires courts to reach factual conclusions without oral evidence or cross-examination and fails to resolve situations where essential practices violate dignity.

Anti-exclusion test and shift towards dignity-based constitutional approach

1. Test meaning: The anti-exclusion test examines whether a religious practice excludes individuals in a way that harms their dignity or denies access to basic goods. If such exclusion occurs, constitutional values of equality and dignity prevail over religious freedom.

2. **Test purpose:** Justice D.Y. Chandrachud proposed the anti-exclusion test to address the limitations of the essential religious practices test. It allows religious groups to define their own beliefs while preventing exclusion that harms dignity.

3. **Constitutional focus:** The test examines whether exclusion violates constitutional guarantees of equal treatment and protection. It focuses on the consequences of exclusion rather than on whether a practice is essential to religion.

4. **Religious autonomy:** The test accepts religious autonomy as a starting point and respects the right of religious communities to manage their affairs. Courts intervene only when exclusion affects dignity and access to basic goods.

5. **Key distinction:** Unlike the essential religious practices test, the anti-exclusion test does not ask whether a practice is essential to religion. It examines whether exclusion violates constitutional guarantees of dignity and equal access.

Broader implications for religious freedom jurisprudence

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1. Constitutional review: The nine-judge Bench will examine broader constitutional questions on religious freedom while hearing the review petitions and related issues. Its ruling will determine how courts should resolve conflicts between religious autonomy and individual dignity.

2. **Bohra exclusion:** The issue involves the right of Dawoodi Bohra religious authorities to exclude members from the community. It raises the constitutional question of whether such exclusion violates dignity and equal religious participation.

3. **Parsi women rights:** The issue concerns whether Parsi women can continue practising the Zoroastrian faith after marrying outside the religion. It raises questions about access to religious life and protection of individual religious freedom.

4. **Social consequences:** Religion and social life are closely connected, and religious practices affect access to important institutions. Courts cannot remain indifferent when such practices affect dignity and equal participation.

5. **Individual priority:** The Constitution places the individual at the centre of concern and protects equal moral membership. Religious autonomy cannot override a person's dignity and access to religious and civic spaces.

Conclusion:

The Constitution protects both religious autonomy and individual dignity. Courts must avoid theological judgment while ensuring that religious practices do not cause exclusion and discrimination. The anti-exclusion test provides a dignity-based constitutional framework. It protects religious belief while ensuring equal access and reinforces the Constitution's commitment to equality, dignity, and individual rights in matters of religion.

Question for practice:

Examine how the Supreme Court's Sabarimala judgment reflects the tension between religious autonomy and constitutional principles of dignity and equality, and discuss the significance of the anti-exclusion test in resolving this conflict.

Source: The Hindu

How India and Canada mended their frayed ties

Source: The post **"How India and Canada mended their frayed ties"** has been created, based on **"How India and Canada mended their frayed ties"** published in **"Indian Express" on 27th February 2026.**

UPSC Syllabus: GS Paper-2-International Relations

Context: The visit of Canadian Prime Minister **Mark Carney** to India marks a significant attempt to reset India–Canada relations after a severe diplomatic crisis that began in 2023 following allegations made by **Justin Trudeau** regarding the killing of **Hardeep Singh Nijjar**. Both countries realised the importance of restoring ties due to strong economic, strategic, and diaspora linkages.

Background of the Diplomatic Crisis

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1. The crisis began in September 2023 when Justin Trudeau alleged that Indian agents were involved in the killing of Hardeep Singh Nijjar in Canada.
2. Prime Minister **Narendra Modi** rejected these allegations and called them politically motivated.
3. Both countries expelled diplomats and withdrew High Commissioners, which led to a sharp deterioration in diplomatic relations.
4. Visa restrictions and closure of consulates affected students, businesses, and diaspora interactions.
5. The crisis also damaged mutual trust and created tensions in trade, security cooperation, and public perception.

Steps Taken to Mend Relations

1. After Mark Carney became Prime Minister in 2025, he showed willingness to rebuild relations with India.
2. Carney treated the Nijjar case as a law enforcement issue rather than a diplomatic dispute.
3. He invited Narendra Modi to the G7 outreach summit, which helped restart political dialogue.
4. Both countries agreed to restore High Commissioners and resume diplomatic engagement.
5. Visa restrictions were eased, and ministerial-level visits resumed.
6. India and Canada created an NSA-level mechanism to address concerns about transnational crimes and extremist activities.

Major Pillars of India–Canada Relations

I. Trade and Economic Relations
1. India and Canada agreed to negotiate a Comprehensive Economic Partnership Agreement to double trade to 70 billion dollars by 2030.
2. India exports pharmaceuticals, machinery, electronics, textiles, and seafood to Canada.
3. India imports pulses, fertilizers, and minerals from Canada.
4. Canada is among the important foreign investors in India.

II. Security and Defence Cooperation

1. India and Canada cooperate through the Joint Working Group on Counter-Terrorism established in 1997.
2. Both countries signed a framework on Countering Terrorism and Violent Extremism in 2018.
3. Recent meetings between national security advisors helped rebuild trust.

III. Energy Cooperation

1. Canada's large reserves of oil, gas, LNG, and critical minerals match India's growing energy needs.
2. Both countries aim to expand cooperation in conventional and renewable energy sectors.

IV. Education Links

1. Indian students form the largest group of international students in Canada.
2. Academic partnerships, joint research programmes, and mobility initiatives strengthen people-to-people ties.

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V. Diaspora Relations

1. Canada hosts over 1.8 million Indo-Canadians, making the diaspora an important bridge between the two countries.
2. Only a small minority among them supports Khalistan, but their activities had strained relations earlier.
3. Both governments now aim to prevent extremist issues from affecting bilateral ties.

VI. Geopolitical Importance

1. Canada is part of the G7 and Five Eyes alliance and shares strategic partnerships with India's key allies.
2. Cooperation in technology, supply chains, and innovation has increased.
3. Global trade uncertainties caused by policies of **Donald Trump** have made India–Canada cooperation more important.

Challenges Ahead

1. The Khalistan issue continues to be sensitive and needs careful handling.
2. Domestic political pressures in Canada may influence India policy.
3. Mutual trust in intelligence sharing must be strengthened.
4. Economic negotiations like the trade agreement may face delays.

Way Forward

1. Both countries should institutionalise high-level dialogue mechanisms.
2. They should fast-track the Comprehensive Economic Partnership Agreement.
3. They should strengthen cooperation against extremism and transnational crimes.
4. They should promote student exchanges and diaspora engagement.
5. They should collaborate in critical minerals, clean energy, and emerging technologies.

Conclusion: India and Canada have taken pragmatic steps to repair their strained relationship by restoring diplomatic channels, separating political disputes from cooperation, and focusing on shared economic and strategic interests. Sustained dialogue, respect for sovereignty, and deeper cooperation in trade, energy, and security will determine the long-term success of this partnership.

Question: Discuss how India and Canada have mended their frayed ties and analyse the future prospects of the relationship.

Source: [Indian Express](#)

Travelling Across the Industrial Corridors of India

Source: The post **"Travelling Across the Industrial Corridors of India"** has been created, based on **"Travelling Across the Industrial Corridors of India"** published in **"PIB" on 27th February 2026.**

UPSC Syllabus: GS Paper-3-Economy

Context: Industrial corridors have emerged as a key strategy to strengthen India's manufacturing ecosystem by connecting major economic centres with high-quality infrastructure. The Union Budget 2026–27 announced

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an integrated East Coast Industrial Corridor with a major node at Durgapur, showing the government's continued focus on corridor-led industrialisation under the **National Industrial Corridor Development Programme**.

About Industrial Corridors

1. Industrial corridors are planned development zones that connect major economic hubs through integrated transport networks such as highways, railways, ports, and airports.
2. They promote industrial clustering by linking manufacturing centres with efficient logistics and infrastructure.
3. They provide globally competitive infrastructure and business-friendly environments for industries.
4. They are developed along major transport routes to ensure efficient movement of goods and labour.

Importance of Industrial Corridors

1. Industrial corridors reduce production and logistics costs by improving multimodal transport connectivity.
2. They provide plug-and-play infrastructure that helps industries start operations quickly.
3. They encourage industrial clustering, which increases productivity and innovation.
4. They generate employment opportunities through skill development programmes.
5. They attract foreign investment through Special Economic Zones and industrial parks.
6. They promote sustainable development through renewable energy use, waste recycling, and green urban planning.
7. They improve quality of life through walk-to-work city planning and better urban infrastructure.

Government Initiatives for Industrial Corridors

I. **National Industrial Corridor Development Programme (NICDP)**
1. The Government of India is implementing projects across 11 industrial corridors under NICDP.
2. These corridors are guided by the PM GatiShakti framework for integrated multimodal connectivity.
3. The programme promotes Low Carbon Cities through green spaces, renewable energy, water recycling, and sustainable transport.
4. Projects are developed as smart industrial cities with plug-and-play infrastructure.

II. Major Industrial Corridors in India

1. The **Delhi-Mumbai Industrial Corridor** includes nodes such as Dholera Special Investment Region and Shendra-Bidkin Industrial Area.
2. The **Chennai-Bengaluru Industrial Corridor** connects southern manufacturing hubs like Tumakuru and Krishnapatnam.
3. The **Amritsar-Kolkata Industrial Corridor** aims to boost development in northern and eastern states.
4. The **Vizag-Chennai Industrial Corridor** strengthens coastal manufacturing and port connectivity.
5. Other corridors include Hyderabad–Nagpur, Hyderabad–Bengaluru, Odisha Economic Corridor, and Bengaluru–Mumbai corridors.

III. Budgetary Support

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1. The Budget 2026–27 allocated ₹3,000 crore to the **National Industrial Corridor Development and Implementation Trust** for infrastructure funding.
2. Twelve additional smart city projects under NICDP were approved with a total cost of ₹28,602 crore.
3. These projects are expected to attract large investments and generate significant employment.

IV. Role of National Industrial Corridor Development Corporation

1. The **National Industrial Corridor Development Corporation Limited** coordinates planning and implementation of industrial corridor projects.
2. It develops smart industrial townships, logistics hubs, and integrated manufacturing clusters.
3. It aims to increase exports and strengthen India's manufacturing sector.

Current Status of Industrial Corridors

1. Projects across 11 corridors are under implementation.
2. Four projects have been completed and four are nearing completion.
3. Projects such as Dholera Special Investment Region and Shendra-Bidkin Industrial Area are attracting large investments.
4. These projects are expected to generate lakhs of jobs and boost regional development.

Benefits of Industrial Corridors

1. **Industrial corridors promote balanced** regional development by bringing industries to new areas.
2. They improve logistics efficiency and reduce supply chain bottlenecks.
3. They strengthen India's participation in global value chains.
4. They increase exports and improve manufacturing competitiveness.
5. They create large-scale employment opportunities.
6. They encourage private investment through Public-Private Partnerships.

Challenges

1. Land acquisition and environmental clearance issues can delay projects.
2. Coordination between central and state governments may be complex.
3. Infrastructure financing requirements are very high.
4. Skill gaps in labour may affect industrial productivity.
5. Global economic uncertainties may slow investment.

Way Forward

1. The government should ensure faster land acquisition and clearances through digital platforms.
2. Skill development programmes should be expanded in corridor regions.
3. Greater private investment should be encouraged through PPP models.
4. Environmental sustainability must remain a priority.
5. Trade agreements and export promotion policies should complement corridor development.

Conclusion: Industrial corridors are transforming India's industrial landscape by providing world-class infrastructure, attracting investment, and generating employment. Government initiatives under NICDP, supported by institutions like NICDC and NICDIT, are helping India move towards becoming a global

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manufacturing hub. With sustained policy support, improved coordination, and focus on sustainability, industrial corridors can play a decisive role in achieving long-term economic growth.

Question: Discuss the role of Industrial Corridors in India's economic development and analyse recent government initiatives to promote them.

Source: [PIB](PIB)

India's Trade Partnerships Powering Global Integration and Growth

Syllabus- GS 2- Bilateral, regional and global groupings and agreements involving India and/or affecting India's interests.

Introduction:

India's global trade integration entered a new phase in 2026, driven by expanding Free Trade Agreements (FTAs) and diversified partnerships. As per UNCTAD's Trade and Development Report 2025, India ranks third among Global South economies in trade partnership diversity, surpassing all Global North nations, reflecting resilience amid tariff uncertainties.

Aligned with the Viksit Bharat vision, India's trade strategy emphasizes export growth, global value chain integration, and employment generation

India's New Trade Partnerships (2025–26)
1. India–EU FTA: The 'Mother of All Deals'

Concluded in January 2026, the India–EU FTA is the most comprehensive agreement in India's trade history.
Key highlights include:

- Preferential access across 97% of EU tariff lines, covering 99.5% of trade value.

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- Immediate duty elimination on 70.4% of tariff lines (90.7% of India's exports), benefiting textiles, leather, footwear, tea, coffee, spices, gems & jewellery, and marine products.
- Phased duty elimination (3–5 years) on 20.3% of tariff lines; tariff-rate quotas for processed foods, steel, and select shrimp/prawn products.
- Exports worth over INR 2.87 lakh crore (USD 33 billion) from labour-intensive industries gain enhanced competitiveness.
- Services: EU committed across 144 sub-sectors including IT/ITeS, professional, education, and business services. Sensitive sectors — dairy, meat, poultry, and cereals — remain fully safeguarded.

Key FTAs concluded in 2025–26 at a Glance

Agreement	Key Market Access	Notable Feature
India–EU FTA (Jan 2026)	97% tariff lines; 99.5% trade value	Mother of All Deals; USD 33B labour exports benefit
India–UK CETA (2025)	~99% of India's exports duty-free	Double Contribution Convention; Rs. 4,000 cr savings
India–Oman CEPA (Dec 2025	Zero duty on 98.08% Oman tariff lines	First country to commit on AYUSH/traditional medicine
India–New Zealand FTA (2025)	100% tariff lines zero-duty from day 1	USD 20B investment; gateway to Oceania/Pacific
India–EFTA TEPA (Oct 2025)	92.2% tariff lines; 99.6% trade value	USD 100B FDI pledge; 1 million direct jobs

2. India-UK Comprehensive Economic and Trade Agreement (CETA)

Bilateral trade stands at USD 56 billion with a target to double by 2030. The agreement grants near-universal duty-free access (99% of exports). A first-of-its-kind Double Contribution Convention eliminates dual social security payments, saving Indian companies over ₹4,000 crore. Agriculture and processed food exports are projected to grow by over 50% in three years.

3. India-Oman Comprehensive Economic Partnership Agreement (CEPA)

Signed in December 2025, the CEPA opens zero-duty access on 98.08% of Oman's tariff lines (99.38% of export value). Remarkably, it is the first agreement globally to extend commitments on traditional medicine (AYUSH) across all modes of supply — a significant win for India's wellness sector.

4. India-New Zealand Free Trade Agreement (FTA)

India's fastest-concluded FTA grants 100% zero-duty access for all Indian exports from day one, supporting farmers, MSMEs, and labour-intensive sectors. The agreement is backed by a USD 20 billion investment commitment over 15 years and positions India as a skilled workforce provider for Oceania and Pacific markets.

5. Previously Operationalised FTAs

India–UAE CEPA (2022) has already crossed the bilateral trade target of USD 100 billion in FY 2024-25. India–Australia ECTA (April 2022) has delivered 8% export growth in FY 2024-25, with full zero-duty access from

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January 2026. The India–Mauritius CECPA (2021) remains India's first trade agreement with an African country, offering preferential access across 300+ product lines.

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Domestic Enablers Strengthening Export Competitiveness

Trade agreements alone cannot deliver results without a supportive domestic ecosystem. India has deployed a multi-layered framework of policy, financial, and regulatory measures:

- **Trade Connect ePlatform**: A tariff explorer service enables exporters to access real-time FTA concession data, reducing information asymmetry.
- **Export Promotion Mission (EPM):** A comprehensive digitally driven framework designed to facilitate export initiatives and align domestic production with global demand.
- **Credit Guarantee Scheme for Exporters**: Provides financial assistance and liquidity support during periods of global uncertainty.
- **RBI Measures**: Extension of export credit tenor to 450 days; repatriation period extended from 9 to 15 months; shipment period against advance payments raised from 1 to 3 years — significantly easing the credit cycle for exporters.
- **Union Budget 2026-27**: Removal of ₹10 lakh value cap on courier exports; duty-free imports of inputs for leather/synthetic footwear and seafood processing; export time limit extended to 1 year for garment and footwear exporters; direct clearance of export cargo from factory premises via electronic sealing.

Together, these measures create an integrated support architecture ensuring liquidity, regulatory clarity, and operational flexibility for India's export ecosystem

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India's Expanding Trade Negotiations

India is widening its trade outreach across regions:

- **India–US Interim Agreement (Feb 2026):** Framework for reciprocal trade, paving the way for a broader Bilateral Trade Agreement (BTA).
- **India–Israel FTA:** First round concluded; focus on fintech, agri-tech, AI, pharma, space, and defence.
- **India–GCC FTA:** Terms of Reference signed to begin talks on goods, services, and food/energy security.
- **ASEAN–India AITIGA Review:** Ongoing talks to unlock greater trade potential.
- **India–Canada CEPA:** Target to raise bilateral trade to USD 50 billion by 2030.
- **India–Mexico:** Discussions to expand trade and sectoral investment ties.

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Challenges need to be addressed

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1. **Non-tariff barriers (NTBs)** like differing standards, certifications, and sanitary norms continue to restrict India's export potential despite tariff concessions.
2. **Limited MSME integration** into global value chains restricts the trickle-down benefits of FTAs to smaller enterprises.
3. **Supply-side constraints** in sunrise sectors like electronics and semiconductors reduce India's ability to capitalise on new market access.
4. **Trade deficit risks** with partners like ASEAN highlight the need for careful calibration to prevent import surges in sensitive sectors.
5. **Lack of awareness among exporters** about FTA provisions, rules of origin, and preferential tariff utilisation reduces effective implementation.

Way Forward

1. **Strengthen standards infrastructure** (BIS, FSSAI, pharma regulators) to meet importing countries' compliance requirements and reduce export rejections.
2. **Develop dedicated export clusters** integrating MSMEs with technology, logistics, and credit support to deepen GVC participation.
3. **Expand supply-side capacity** in electronics, defence, and green energy to convert FTA market access into actual export growth.
4. **Conduct targeted outreach and capacity-building programmes** to improve FTA utilisation rates among exporters, especially MSMEs.
5. **Complement FTAs with Bilateral Investment Treaties (BITs)** to attract quality FDI into manufacturing and protect Indian investments abroad.

Conclusion

India's 2025–26 trade partnerships mark a shift from a reactive to a proactive global trade strategy. Landmark FTAs with the EU and UK, along with negotiations with the US, GCC, Israel, and ASEAN, position India as a trusted partner in the emerging multipolar trade order.

Backed by domestic reforms enhancing exporter competitiveness, India's trade ecosystem is becoming more resilient and globally integrated. As India advances toward Viksit Bharat 2047, these partnerships serve as pillars of strategic autonomy and geopolitical influence.

Question for Practice: India's recent Free Trade Agreements (2025–26) mark a shift towards a proactive and strategic trade policy." Discuss how these trade partnerships can enhance India's global integration and economic growth. Also examine the key challenges that need to be addressed for effective implementation

Source- PIB

India's Revised GDP Estimates and New Measurement Framework

Syllabus- GS 3- Indian Economy

Introduction

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India has revised its GDP base year from **2011–12 to 2022–23**, marking a major reform in its statistical framework. This update improves accuracy, detail, and global comparability of national income data -crucial for evidence-based policymaking under the Viksit Bharat vision.

The revision reflects India's rapid structural changes, including growth in digital services, renewable energy, and the gig economy, which were underrepresented earlier. The new series follows the System of **National Accounts (SNA) 2008** and aligns with the IMF's Quarterly National Accounts Manual 2017.

Key Growth Numbers:

The revised GDP estimates paint a robust picture of India's economic momentum:

- Real GDP growth for FY 2025–26 is estimated at 7.6%, up from 7.1% in FY 2024–25.

- Nominal GDP (at current prices) is projected to grow by 8.6% in FY 2025–26.

- The manufacturing sector has recorded double-digit growth in both FY 2023–24 and FY 2025–26.

- Secondary and tertiary sectors have exceeded 9.0% growth in FY 2025–26.

- The 'Trade, Repair, Hotels, Transport & Communication' sector grew at 10.1% at constant prices.

- Q3 (October–December 2025–26) real GDP stands at ₹84.54 lakh crore — a 7.8% growth, accelerating from 7.4% in Q3 FY 2024–25.

Key Structural Changes in the New Gross Domestic Product (GDP) Series

1. **Revised Base Year (2022–23):** The base year has been updated from 2011–12 to 2022–23 to reflect the current economic structure. The year was chosen as a normal post-pandemic year, improving comparability and accuracy.

2. **Improved Sector-wise Estimation:**

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- Private corporate Gross Value Added (GVA) is now allocated using an activity-wise revenue share method instead of the dominant-sector approach.
- Better coverage of the general government sector, including housing services and autonomous/local bodies.

3. **Better Measurement of Household and Informal Sector:** Annual Survey of Unincorporated Sector Enterprises (ASUSE) and Periodic Labour Force Survey (PLFS) are used for direct annual estimation, improving coverage of informal enterprises and unincorporated activities.

4. **Enhanced Consumption and Demand Estimation:** Private Final Consumption Expenditure (PFCE) is estimated using Household Consumer Expenditure Surveys, production data, and administrative datasets, strengthening domestic demand assessment.

5. **Expanded Use of Administrative and GST Data:** Greater use of Goods and Services Tax (GST) data, Ministry of Corporate Affairs filings, and other administrative records improves formal sector measurement and reduces estimation errors.

6. **Methodological Upgrade – Double Deflation and SUT Integration:** Adoption of double deflation (separate adjustment of inputs and outputs) and integration of Supply and Use Tables (SUT) enhance consistency between production and expenditure estimates and reduce statistical discrepancies.

7. **Improved Financial and Agriculture Sector Estimation:** Use of Reserve Bank of India (RBI) banking data, actual financial data of Non-Banking Financial Companies (NBFCs), and updated agriculture datasets improves estimation of financial services, livestock, fisheries, and related activities.

Key Challenges in India's New GDP Series

1. **Methodological Complexity:** Implementation of double deflation and integration of multiple high-frequency data sources increase technical challenges.

2. **Informal Sector Measurement Gaps:** Limited real-time data coverage of the informal and unorganised sectors affects estimate accuracy.

3. **State-Level Capacity Variations:** Differences in statistical capacity across States and Union Territories hinder Gross State Domestic Product (GSDP) harmonisation.

4. **Back-Series and Data Lag Issues:** Delay in releasing historical back-series data limits long-term trend analysis.

5. **Transition to SNA 2025:** The United Nations Statistical Division is transitioning to the System of National Accounts (SNA) 2025, expected for global adoption around 2029–30. India will need another major revision in its next base year update to remain aligned.

Way Forward

1. **Complete Price Index Reforms:** Expedite the revised Wholesale Price Index (WPI) series and introduce the Producer Price Index (PPI) for better price deflation.

2. **Strengthen State Statistical Systems:** Enhance Gross State Domestic Product (GSDP) estimation capacity in States and Union Territories with support from the National Statistical Office (NSO) and the Ministry of Statistics and Programme Implementation (MoSPI).

3. **Integrate Real-Time Administrative Data:** Expand the use of Goods and Services Tax (GST), Public Financial Management System (PFMS), e-Vahan, and Employees' Provident Fund Organisation (EPFO) data to reduce estimation delays.

4. **Improve Transparency:** Publish detailed "Sources and Methods" documentation to boost credibility and allow independent scrutiny.

5. **Align with Global Standards:** Initiate preparations for adopting System of National Accounts (SNA) 2025, especially in digital economy and environmental accounting.

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Conclusion

The revision of India's GDP base year to 2022–23 is a significant stride in building a credible, modern, and internationally aligned statistical system. By integrating richer data sources, deploying advanced methodological tools like double deflation and SUT-balancing, and expanding coverage of the informal and digital economy, the new series provides a far more accurate mirror of India's economic reality.

Question for Practice- India has revised its Gross Domestic Product (GDP) base year to 2022–23, introducing significant methodological and structural changes in national income estimation. Discuss the key structural reforms introduced in the new GDP series. Also briefly highlight the major challenges associated with its implementation.

Source- PIB

A holistic semicon push

Source: The post **"A holistic semicon push"** has been created, based on **"A holistic semicon push"** published in **"BusinessLine" on 28th February 2026.**

UPSC Syllabus: GS Paper-3-Science and technology

Context: Semiconductors form the foundation of the digital economy by enabling telecommunications, artificial intelligence, defence systems, electric mobility, and renewable energy technologies. In the backdrop of geopolitical tensions and pandemic-induced supply chain disruptions, strategic control over semiconductor supply chains has become a national priority. In this context, Budget 2026–27 introduced **India Semiconductor Mission (ISM) 2.0** along with an expanded Electronics Components Manufacturing Scheme (ECMS), signalling a transition towards a comprehensive semiconductor ecosystem.

Background: ISM 1.0 and Its Limitations

1. The first phase of the India Semiconductor Mission was approved in December 2021 with an outlay of ₹76,000 crore.
2. It primarily focused on developing domestic fabrication and packaging capacity.
3. It successfully attracted anchor investments such as Tata Electronics' fabrication facility in Gujarat, Micron's ATMP unit at Sanand, and CG Power's OSAT operations.
4. The regulatory framework relied largely on upfront capital subsidies and State-level fiscal and infrastructure incentives to reduce entry barriers in a capital-intensive and high-risk sector.
5. However, ISM 1.0 remained concentrated on downstream manufacturing outcomes. Upstream segments such as fabrication equipment, specialty materials, advanced wafers, and design infrastructure received limited attention.
6. As a result, India's semiconductor manufacturing ecosystem continued to depend significantly on imports and foreign technology.

Objectives and Focus Areas of ISM 2.0

ISM 2.0 seeks to correct these structural gaps through an integrated policy approach.

1. **Domestic Production of Equipment and Materials**

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a. ISM 2.0 prioritises the domestic manufacturing of fabrication equipment, specialty chemicals, gases, advanced wafers, precision machinery, and advanced packaging services.

b. The expanded ECMS with an outlay of ₹40,000 crore plays a central role in strengthening component and material manufacturing.

2. **Development of Full-Stack Indian Intellectual Property**

a. The mission aims to move beyond fabrication capacity and promote indigenous chip design and full-stack intellectual property development.

b. This approach seeks to embed manufacturing within a broader innovation ecosystem.

3. **Creation of Industry-Led Research and Training Infrastructure**

a. The policy emphasises the establishment of research centres and skilling hubs to build a specialised semiconductor workforce.

b. This marks a shift towards non-fiscal regulatory instruments that focus on human capital development and institutional capacity building.

Policy Instruments under ISM 2.0

1. The government has adopted a mix of fiscal and non-fiscal tools. Concessional customs duty regimes have continued to reduce cost pressures.

2. The absence of sector-specific levies improves investment attractiveness. Cluster-based development models are being promoted to ensure coordinated infrastructure development and supply chain integration.

3. Additionally, greater emphasis on research, skilling, and supplier development enhances long-term sustainability.

Significance of ISM 2.0

1. **Strategic Significance:** ISM 2.0 enhances India's strategic autonomy by reducing dependence on foreign semiconductor supply chains. It strengthens national security in critical sectors such as defence and telecommunications.

2. **Economic Significance:** The mission has the potential to generate high-value employment and deepen the electronics manufacturing ecosystem. It can improve India's export competitiveness in advanced technology sectors.

3. **Technological Significance:** By focusing on indigenous intellectual property and research capacity, ISM 2.0 promotes innovation and reduces technological dependence on foreign firms.

4. **Supply Chain Resilience:** The emphasis on upstream segments such as equipment and materials enhances supply chain resilience and reduces vulnerability to global disruptions.

Challenges

1. **High Capital Intensity and Long Gestation Periods:** Semiconductor fabrication requires extremely high capital investment and involves long payback periods, which can deter private participation despite subsidies.

2. **Technological Complexity:** The semiconductor industry evolves rapidly, and catching up with established global leaders requires continuous technological upgrades and sustained innovation.

3. **Dependence on Global Supply Chains:** Despite policy support, India may continue to rely on imported equipment, raw materials, and foreign technology in the short to medium term.

4. **Skill Gaps:** The domestic workforce may face shortages of highly specialised engineers and technicians required for advanced semiconductor manufacturing and design.

5. **Global Competition:** Countries such as the United States, Taiwan, South Korea, and China are offering aggressive incentives, making global competition intense.

Way Forward

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1. **Deepening Upstream Integration:** India must accelerate domestic production of semiconductor-grade materials and fabrication equipment to reduce import dependence.
2. **Strengthening R&D Ecosystem:** Public–private partnerships in semiconductor research should be expanded, and long-term funding mechanisms must be institutionalised.
3. **Skilling and Academic Collaboration:** Industry–academia collaboration should be strengthened to create specialised semiconductor curricula and research programs.
4. **Stable and Predictable Policy Environment:** The government must ensure regulatory certainty, timely disbursal of incentives, and ease of doing business to build investor confidence.
5. **Global Strategic Partnerships:** India should leverage strategic partnerships for technology transfer while simultaneously building domestic intellectual property capabilities.

Conclusion: India Semiconductor Mission 2.0 represents a transition from subsidy-driven capacity creation to ecosystem-led industrial policy. By integrating fabrication, design, materials, research, and skilling within a coherent framework, the mission seeks to create a robust and sustainable semiconductor ecosystem. However, addressing structural challenges related to capital intensity, technological gaps, and skill shortages will be critical for achieving long-term technological self-reliance and strategic autonomy.

Question: "India's semiconductor strategy must move beyond fabrication to ecosystem building." In light of ISM 2.0, examine the opportunities and challenges in achieving this objective.

Source: BusinessLine

'Pax Silica' Alliance and India

Source: The post **"'Pax Silica' Alliance and India"** has been created, based on **"What is 'Pax Silica' alliance that India joined and how does it matter?"** published in **"Deccan Herald" on 28th February 2026.**

UPSC Syllabus: GS Paper-3-International Relations

News: India recently joined the **Pax Silica**, a US-led initiative aimed at securing critical minerals, semiconductor supply chains, and artificial intelligence ecosystems. The alliance was proposed by **Jacob Helberg** and was signed in the presence of Union Minister **Ashwini Vaishnaw** and US envoy **Sergio Gor**.

About Pax Silica

● Pax Silica is an **international alliance** formed in **December 2025** to build **cooperation in critical minerals** and **artificial intelligence supply chains.**
● The **name combines "Pax", meaning peace and "Silica" referring to the mineral base of semiconductor chips.**
● The alliance seeks **to secure the entire production lifecycle from the extraction of critical minerals** to semiconductor fabrication and the development of frontier AI models.
● It aims **to build a trusted ecosystem of countries and companies** that collaborate across mining, refining, manufacturing, software platforms, and AI systems.
● **Members of the Alliance:** The alliance includes **Australia, Japan, South Korea, Singapore, the UK, Israel, UAE, Netherlands, Greece, Qatar,** and **India as signatory members.**
    ● **Canada, the European Union, Taiwan, and OECD participate** as **non-signatory members.**

Importance of Pax Silica

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- **China dominates global rare earth production and processing** and produces **around 270,000 tonnes annually.**
- **China has previously restricted rare earth export**s during trade tensions with the US, exposing vulnerabilities in global supply chains.
- **Critical minerals are essential** for electric vehicles, smartphones, data centres, defence equipment, and AI systems.
- **Semiconductor shortages recently disrupted** the automobile and electronics industries worldwide, including in India.
- Pax Silica aims **to reduce overdependence on China and create diversified, resilient supply networks.**

Importance of India Joining

- **India's entry signals renewed strategic convergence** with the US and other partner nations.
- India **holds approximately 8.52 million tonnes of rare earth reserves**, which are among the largest globally, though production remains low.
- India has **a fast-growing semiconductor design ecosystem**.
- **Around 10 semiconductor fabrication plants** are established or under development, with initial production expected soon.
- **India strengthens the alliance** through its mineral reserves, growing market, and skilled human capital.

Benefits for India

- India will **gain access to advanced semiconductor** manufacturing equipment and global supply chain networks.
- India will **benefit from GPU infrastructure** and AI ecosystem collaboration.
- India will **reduce dependence on China-dominated mineral** and chip supply chains.
- The **alliance complements India's National Critical Mineral Mission.**
- The **alliance also strengthens the India Semiconductor Mission** and accelerates domestic chip manufacturing.

Challenges

- **India's rare earth production remains significantly below** its reserve potential due to technological and regulatory constraints.
- **Establishing semiconductor fabrication plants** requires high capital investment and advanced technological expertise.
- **Overalignment with a US-led framework may complicate** India's strategic autonomy in dealing with China.
- **Supply chain diversification** may increase short-term production costs for industries.
- **Geopolitical tensions between major powers could disrupt cooperation** within the alliance.

Way Forward

- India should **enhance domestic mining, refining, and processing capabilities** for rare earth elements.
- India **must invest in research and development** to strengthen semiconductor manufacturing and AI capabilities.

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- **Public-private partnerships should be promoted** to accelerate fabrication plant completion and technology transfer.
- India should **balance strategic partnerships** while maintaining its policy of strategic autonomy.
- **Regulatory reforms should be introduced** to streamline approvals in the mining and high-tech manufacturing sectors.
- S**kill development initiatives should be expanded** to create a workforce capable of handling advanced chip and AI technologies.

Conclusion: Pax Silica represents a strategic shift toward securing critical minerals, semiconductor supply chains, and AI ecosystems. India's participation enhances its economic security, technological advancement, and global strategic position. Effective domestic reforms and careful geopolitical balancing will determine how fully India benefits from this alliance.

Question: Discuss the objectives and scope of the Pax Silica alliance. How does India's participation strengthen both the alliance and India's strategic interests?

Source: Deccan Herald

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