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Features :

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Most complete coverage of major News Papers editorials

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Deepfakes and Democracy

The Ministry of Electronics and Information Technology (MeitY) has proposed draft amendments to the IT Rules, 2021, to regulate synthetic content, including AI-generated videos, images, and voices. The draft aims to make the creators and platforms behind such content accountable and transparent. If adopted, India would become one of the first democracies to formally address the dangers of AI-driven misinformation.

Features of Draft Amendments

The government's **goal is to curb the spread of impersonation**, fake news, and deepfake-based fraud without stifling innovation.

- They define "**synthetically generated information"** as content created or altered by algorithms to resemble authentic media.
- They require **platforms that create or host such content to label it clearly**, for example, dedicating at **least 10 per cent of visual space or the first 10 per cent of audio to disclaimers.**
- They mandate **automated detection systems** and user **declarations** for synthetic media uploads.
- They **preserve safe-harbour protection** for intermediaries that remove harmful synthetic content, while penalising those that don't.

Challenges/Needs for Amendments

- The **deepfakes** have **infiltrated** politics, entertainment, and social discourse.
- The AI technology can also **destroy reputations, manipulate elections, or incite violence**.
- India's **digital population is vast**, multilingual, and heavily reliant on social media for news. The risk of viral misinformation is therefore exponentially higher.
- The draft's proposed **"10 per cent visual disclaimer"** is symbolically strong but **technically weak**.

Way Forward

- **Verification infrastructure:** Build a digital provenance framework, akin to Aadhaar, for authenticity, where each piece of content carries an invisible but verifiable signature.
- **Tiered accountability:** Differentiate between platforms that host, generate, or monetise synthetic media. Responsibility should rise with influence.
- **AI literacy:** Equip citizens to detect manipulation.

International Case Studies

- The EU's AI Act mandates watermarking of synthetic content.
- The US relies on voluntary corporate commitments.
- China requires government pre-approval for "deep synthesis" media.

Conclusion

Democracy runs on trust. And trust is fragile when truth becomes fluid. The solution isn't censorship. Regulate authenticity, not opinion. If India can institutionalise transparency in AI-generated media, it won't just protect its elections. It will export a model of digital responsibility for the world.

Source: Indian Express

Contours of Constitutional Morality

Source: The post **"Contours of Constitutional Morality"** has been created, based on **"Contours of Constitutional Morality"** published in "The Hindu" on 27th October 2025.

UPSC Syllabus: GS Paper -2- Indian Constitution—Historical Underpinnings, Evolution, Features, Amendments, Significant Provisions and Basic Structure.

Context: Constitutional morality in India ensures that governance adheres to constitutional values rather than majoritarian views or political interests. It protects fundamental rights, maintains institutional balance, and prevents arbitrary use of power. Growing judicial reliance on this principle highlights the need for continuous civic awareness to uphold democratic integrity.

Meaning and Key Elements

- Constitutional morality refers **to the obligation to uphold the values, principles, and spirit enshrined in the Constitution** while functioning within a democratic framework.
- Constitutional morality ensures tha**t the Constitution remains the supreme guiding force** above individual or majoritarian preferences.
- It includes **an unwavering commitment to fundamental rights**, the rule of law, and institutional checks and balances.
- It demands that **governance protect equality, liberty, justice, participation, and human dignity** for all individuals.
- It involves **adherence not only to written constitutional provisions** but also to conventions and ethical conduct that preserve democratic functioning.

Judicial Interpretation

- The Supreme Court has clarified that **constitutional morality must prevail over social or popular morality,** particularly when fundamental rights are at stake.
- In the ***Navtej Singh Johar* case,** the Court held that criminalising same-sex relationships violated constitutional morality by undermining dignity and equality.
- In the ***Joseph Shine* case,** the Court struck down the adultery law because it treated women as property, which conflicted with constitutional values.
- Courts have invoked constitutional morality to prevent misuse of power by political authorities, such as in ***B.R. Kapur v. State of Tamil Nadu*, where eligibility for constitutional office was tested** against constitutional norms.
- Judicial decisions **repeatedly emphasise that constitutional principles must guide decision-making in governance**, even when public opinion differs.

Challenges

- The **rise of majoritarian politics** poses a threat to constitutional morality by prioritising popular sentiment over constitutional safeguards.
- A **lack of civic understanding about constitutional values** weakens public commitment to constitutional governance.
- **Political actors sometimes use constitutional rhetoric selectively** to justify actions that actually undermine constitutional principles.
- **Institutional independence** is often challenged by executive dominance, which disrupts constitutional balance.

Way Forward

- India needs continuous civic education to nurture respect for constitutional ideals among citizens and leaders.
- Strong and autonomous institutions must be protected so that checks and balances function effectively.
- Lawmakers and public authorities must discharge their duties strictly in accordance with constitutional obligations rather than partisan interests.
- Judicial vigilance must continue to protect rights and prevent violations of constitutional morality.
- The cultivation of constitutional morality must become a sustained effort to ensure that democratic norms do not erode over time.

Conclusion: Constitutional morality is essential for protecting democratic values and ensuring that governance remains anchored in justice, equality, liberty, and dignity. A society that consistently follows constitutional morality strengthens constitutional democracy and prevents the arbitrary or oppressive exercise of power. The continuous reinforcement of constitutional morality is critical to safeguarding the future of India's constitutional system.

Question: Constitutional morality must act as a safeguard against the tyranny of the majority and arbitrary use of state power." Discuss with suitable judicial illustrations.

Internationalising the Indian Rupee and India–Nepal Economic Ties

Source: The post **"Internationalising the Indian Rupee and India–Nepal Economic Ties"** has been created, based on **"Winding up the clock of India-Nepal economic ties"** published in "The Hindu" on 27th October 2025.

UPSC Syllabus: GS Paper -3-Indian Economy and issues relating to Planning, Mobilization of Resources, Growth, Development and Employment.

Context: Internationalising the Indian Rupee (INR) is a key economic objective of the Government of India to strengthen India's position in regional and global finance. Nepal plays a vital role in this strategy because of its deep economic engagement and monetary interdependence with India.

Recent RBI Measures

1. The RBI has **permitted Authorised Dealer (AD) banks to lend Indian Rupees to non-residents in Nepal,** supporting trade and business activities.
2. The RBI has **permitted Special Rupee Vostro Accounts to be used for investment in corporate bonds, commercial papers, and government securities** within India.

3. The RBI has decided **to establish a transparent reference exchange rate for the INR** to support smoother INR-settled transactions with major trade partners, including Nepal.

Significance for Nepal's Economy

1. Nepal relies on India for over **60 percent of its imports and one-third of its exports,** which makes INR-based trade highly beneficial.
2. **Access to INR liquidity strengthens Nepal's businesses** that depend on Indian supply chains and markets for growth.
3. **INR-denominated lending allows Nepalese firms** to avoid costly dollar conversions and reduces their exposure to global currency volatility.
4. **Increased INR availability can help Nepal recover from sluggish growth** caused by reduced remittances and weak industrial performance after COVID-19.

Broader Economic and Strategic Benefits

1. The e**xpansion of INR usage reduces dependence** on the US dollar and strengthens financial sovereignty in the region.
2. **Easier access to Indian finance supports sectors** like hydropower, tourism, manufacturing, and cross-border trade.
3. **Formalising trade** through INR reduces informal transactions and improves transparency in border commerce.
4. This **initiative strengthens India's role as a financial anchor** in South Asia and reinforces long-term economic partnership with Nepal.

Challenges in Implementation

1. **Economic and Domestic Constraints in Nepal**
    a. Nepal's private sector continues **to struggle with low productivity, weak investor confidence**, and limited access to competitive credit.
    b. Nepal's **financial sector requires stronger governance mechanisms** to manage increased foreign lending responsibly.
2. **Regulatory and Institutional Challenges**
    a. The **alignment of regulatory frameworks between the Reserve Bank of India and Nepal Rastra Bank is still evolving** and requires sustained cooperation.
    b. Nepal needs **stronger sovereign guarantee mechanisms** and improved credit ratings for large-scale INR financing.
3. **Political and Geopolitical Sensitivities**
    a. Some groups in Nepal express concerns that **deeper INR integration may lead to excessive economic dependence** on India.
    b. Nepal's engagement with China could **complicate a more profound monetary alignment with India.**
4. **Operational and Market Risks**
    a. **Maintaining the INR-NPR exchange rate peg requires careful monetary coordination** to avoid instability.
    b. Rapid expansion of cross-border credit without oversight could **lead to debt vulnerabilities in Nepal.**

Way Forward

- Both countries should **establish a joint mechanism to oversee currency cooperation, credit facilitation, and cross-border regulatory compliance.**
- Nepal **should improve the ease of doing business, strengthen industrial capacity, an**d develop logistics infrastructure at key border points.
- India should **expand INR-based trade into digital payments,** energy cooperation, and institutional financing platforms.
- **Continuous confidence-building measures** are necessary to ensure that monetary cooperation remains equitable and mutually respectful.

Conclusion: Internationalising the Indian Rupee through deeper financial integration with Nepal has the potential to reshape regional trade and economic resilience. This partnership supports Nepal's development needs while advancing India's strategic goal of strengthening the global standing of the Rupee. A coordinated, transparent, and trust-based approach will ensure that both nations benefit from a stable and future-oriented economic relationship.

Question: Discuss the recent initiatives taken by the Reserve Bank of India to promote the internationalisation of the Indian Rupee and examine how these measures can reshape India–Nepal economic ties.

Topic - International Relations

Restoring Balance in the Indo-Pacific

The Indo-Pacific region has re-emerged as a focal point in global geopolitics after a period of relative neglect, during which major powers such as the US shifted their attention to crises in Europe and the Middle East. This lull, however, allowed China to quietly expand its influence, reshaping regional dynamics and underlining the need for new strategies among key stakeholders, especially India.

Key Developments in the Indo-Pacific

- **China's incremental expansion:** China has utilized the period of global distraction to expand influence through ports, infrastructure, logistics, and dual-use projects, notably in Myanmar and Cambodia, without establishing overt military bases.
    - The strategy focuses on building "**incremental advantage**," leveraging commercial projects for long-term strategic flexibility.
- **US disengagement and erosion of regional rrust:** The US shifted its attention to Europe and the Middle East, leading to a strategic lull in the Indo-Pacific.
    - Reduced sustained engagement by the US has resulted in the Quad lacking the steady coordination needed for robust deterrence.
- **Rise of autonomous regional strategies:** India, Japan, and Australia are pursuing more independent and decentralized security and economic strategies.
    - These countries are strengthening bilateral ties, mini-lateral frameworks, and enhancing indigenous capabilities beyond dependence on American leadership.
- **Growing coordination challenges:** Diplomatic strains, such as cooling Indo-US relations and revived US interest in Pakistan, have further thinned strategic cooperation.

- Gaps in coordination and persistent disengagement give China space to shape regional norms and expand its influence.

- **Risk of eroding deterrence:** The principal threat is not outright war but a gradual erosion of deterrence and trust, making room for coercive tactics and norm revision by China.

Way Forward

- **Sustained strategic engagement:** India should prioritize continuous diplomatic and maritime presence across the Indo-Pacific, avoiding a retreat into continental preoccupations.
- **Capacity building and investment:** Strengthen maritime domain awareness, upgrade logistics and coastal infrastructure, and invest in dual-use development that serves both economic and defense interests.
- **Deepening partnerships:** Expand partnerships in disaster relief, climate resilience, and connectivity projects, especially with ASEAN and Pacific island nations.
    - Reinforce involvement in forums such as the Quad and foster inclusive diplomacy with smaller regional states.
- **Promoting regional resilience:** Support collective approaches that emphasize autonomy, rule-based order, and pluralistic cooperation over rigid bloc alignments.
    - Focus on adaptation and presence to prevent the dilution of deterrence and ensure India's stakes in regional security and stability.

Conclusion

The Indo-Pacific's future depends on the ability of regional democracies, especially India, to restore persistent, purposeful engagement. Timely action can reverse the drift and ensure a stable, open, and pluralistic maritime order that secures both national interests and collective security.

Source: TNIE

A start for North-South carbon market cooperation

Source: The post **"A start for North-South carbon market cooperation"** has been created, based on **"A start for North-South carbon market cooperation"** published in "The Hindu" on 28th October 2025.

UPSC Syllabus: GS Paper -2-Effect of Policies and Politics of Developed and Developing Countries on India's interests

Context: The EU and India have agreed to link India's Carbon Market (ICM) with the EU's Carbon Border Adjustment Mechanism (CBAM), allowing carbon prices paid in India to be deducted from CBAM levies at the EU border. This collaboration represents a significant shift in global climate governance by establishing a model for North–South carbon market cooperation.

Significance of Linking ICM with CBAM

1. This linkage prevents **Indian exporters from bearing both domestic carbon compliance costs** and CBAM charges simultaneously.
2. It encourages Indian industries **to adopt early decarbonisation** measures through credible carbon pricing.

3. It **enhances the legitimacy and global acceptance** of India's evolving carbon market architecture.
4. It **strengthens India–EU economic cooperation** while aligning climate transition pathways between developed and developing economies.
5. It **provides a long-term incentive for market-based climate action** in India rather than reliance on regulatory mandates alone.

Key Challenges in Operationalisation

1. **Underdeveloped Domestic Carbon Market**
    a. India's ICM is still evolving because it relies on **emission-intensity-based credits** rather than **absolute emission caps** that are required under EU standards.
    b. Current compliance, monitoring, and verification systems in India **lack the institutional robustness seen in the EU-ETS.**
    c. The **absence of legally binding penalties and strong enforcement mechanisms** limits environmental integrity.
2. **Price Gap and Cost Burden**
    a. The **carbon price in the EU is significantly higher** than in India, which may result in EU authorities rejecting Indian credits as insufficient.
    b. **Indian exporters may experience a double financial burden** until price convergence and sector coverage alignment take place.
3. **Institutional and Regulatory Barriers**
    a. The EU **demands transparent and independent regulatory oversight,** which requires a structural redesign of India's compliance systems.
    b. **Alignment on sectoral carbon contracts and negotiated price floors** would be politically difficult to agree upon.
4. **Sovereignty and Trade Concern**
    a. India has **historically opposed CBAM at the WTO**, viewing it as a unilateral and protectionist measure, which creates a political contradiction in formally linking with it.
    b. The **EU's authority to judge the adequacy of India's climate action** raises sensitivities about policy sovereignty.

Legal and Political Risks

1. Disputes may arise **if the EU rejects India's carbon pricing** as inadequate, pushing the issue into legal or political escalation.
2. Any **weakening of domestic compliance** under internal industrial pressure could restore CBAM levies fully, destabilising export flows.
3. **Misalignment in market design and political resistance** on both sides could jeopardise the continuity of cooperation.

Way Forward and Opportunities

1. India **must strengthen cap-setting, monitoring, verification,** and enforcement mechanisms to meet global carbon market expectations.
2. A **negotiated carbon price floor and expanded sectoral coverage** would ensure smoother CBAM deduction for Indian exporters.
3. India and the EU **can expand technical cooperation** to ensure a predictable, credible, and transparent transition.

4. **Successful implementation will accelerate industrial decarbonisation** and promote low-carbon value chains across borders.

Conclusion: The EU-India carbon market linkage is one of the most important climate and trade arrangements between major global economies because it protects exporters while advancing environmental goals. Its success will depend on strong political commitment, credible market governance, and equitable treatment under CBAM. This cooperation has the potential to establish a global template for North–South collaboration on carbon markets, provided India strengthens its institutional foundations and compliance confidence.

Question: Discuss the significance and challenges of linking India's carbon market with the European Union's Carbon Border Adjustment Mechanism (CBAM).

The race for global leadership in science

Source: The post **"The race for global leadership in science"** has been created, based on **"The race for global leadership in science"** published in "The Hindu" on 28th October 2025.

UPSC Syllabus: GS Paper -3- Science & Technology

Context: The United States has historically dominated global science and technology innovation due to strong public investment and world-class institutions. China's sustained rise in R&D expenditure, scientific output, and institutional capacity indicates a major transition in the global scientific leadership landscape.

Concerns over Declining U.S. Leadership

1. **Major budget cuts across NSF, NIH, NASA, and other agencies** have reduced grant funding and weakened frontier research.
2. The **cancellation of approximately 40,000 research grants and key vaccine projects** has undermined biomedical innovation.
3. **Withdrawal of funding for global health programmes** risks weakening international disease control efforts.
4. **Restrictive visa policies and termination of fellowships** are causing a growing brain drain from the U.S. research ecosystem.

China's Surge in S&T Leadership

1. China has **increased long-term STI investments** for two decades, focusing on biosciences, chemistry, AI, and environmental sciences.
2. China now **leads global university rankings in the Nature Index, surpassing U.S. institutions** in high-impact scientific output.
3. Chinese researchers **contribute nearly 40 percent of all global AI publications,** outperforming the U.S. and Europe.
4. China's **R&D spending is rising at 8.7 percent,** far higher than the U.S. **1.7 percent**, and is projected to surpass it within three years.
5. **Strategic initiatives like Made in China 2025** and the Medium and Long-Term Plan aim to consolidate China's position as a global technology power.

Challenges in the Global Science Leadership Transition

1. **Increasing geopolitical rivalry between** the U.S. and China may fragment global scientific collaboration and knowledge exchange.
2. **Security-driven restrictions on international research partnerships** could slow progress in critical technologies.
3. China still faces challenges in **academic freedom, transparency, and ethical research standards,** which may deter global collaboration and trust.
4. U.S.A **risks innovation stagnation** due to unstable research funding cycles and declining support for basic science.
5. **Brain drain dynamics could intensify global inequalities** in S&T capacity as talent moves from funding-constrained regions to high-investment hubs.
6. **Over-politicisation of research priorities** may shift focus from long-term scientific discovery to short-term geopolitical outcomes.

Implications for Global Science and Geopolitics

1. China's **rise could alter the existing science governance structure** dominated by the United States and its Western allies.
2. **Emerging-technology leadership in AI, semiconductors, and quantum** could reshape global economic and military power relations.
3. The **global order may witness a shift from academic openness** to competitive technological nationalism.

Conclusion: The United States risks erosion of its global leadership in science due to declining investments and weakening talent inflows. China's coordinated strategy positions it strongly for scientific dominance, although institutional challenges remain. The global balance of power in the 21st century will be increasingly determined by nations that maintain robust, inclusive, and innovation-driven research ecosystems.

Question: Evaluate the shift in global scientific leadership with reference to the rise of China and the challenges faced by the United States.

Significance of ASEAN for India

Source: The post **"Significance of ASEAN for India"** has been created, based on **"Missed opportunity: On India and ASEAN summit in Malaysia"** published in "The Hindu" on 29th October 2025.

UPSC Syllabus: GS Paper -2-Effect of Policies and Politics of Developed and Developing Countries on India's interests

Context: India has been a dialogue partner of ASEAN since 1995 and a Summit-level participant since 2002, which makes these meetings a crucial diplomatic platform for India in the Indo-Pacific region. The recent ASEAN Summit in Malaysia should have been an important opportunity for India to strengthen its regional engagement.

Significance of ASEAN for India

1. ASEAN **plays a central role in India's Act East Policy** and its wider Indo-Pacific strategy.

2. The ASEAN Summit, the ASEAN–India Summit, and the East Asia Summit allow **India to interact with major powers** including U.S.A, China, Japan, Australia, Russia, and South Korea.

3. **Cooperation with ASEAN supports India's priorities in maritime security,** disaster relief, humanitarian assistance, supply chain resilience, and the blue economy.

4. The summit setting **provides momentum for advancing trade reforms** such as the review of the ASEAN-India Trade in Goods Agreement (AITIGA).

India's Position at the 2025 Summit

1. India was **represented by the External Affairs Minister** at a time of global economic volatility, strategic competition, and maritime tensions in the Indo-Pacific.

2. India **highlighted concerns over tariff barriers, reliable access** to critical exports, and supply-chain security.

3. India and ASEAN **reaffirmed their commitment to finalise AITIGA reforms,** which are essential for balanced and sustainable trade relations.

Challenges in India–ASEAN Engagement

1. India c**ontinues to face strong strategic and economic competition** from China in the ASEAN region.

2. T**rade imbalances and delays in connectivity projects** have limited the full potential of economic cooperation.

3. **Diplomatic sensitivities,** including past tensions with Malaysia over Pakistan, have **occasionally strained relations.**

4. The **absence of India's top leadership at key ASEAN engagements contributes to a perception of inconsistency** in India's regional commitment.

Why It Was a Missed Opportunity

1. The **absence of the Prime Minister diminished India's visibility** and **diplomatic signalling** at a critical geopolitical moment.

2. ASEAN leaders were not **fully persuaded by the official explanation,** especially because India's absence had also occurred in 2022.

3. India **lost a valuable opportunity to demonstrate leadership when other major powers reaffirmed their commitment** simply through their presence.

Implications

1. India's **absence may undermine trust and reduce confidence among ASEAN partners** regarding India's long-term engagement.

2. It **may create strategic openings for other powers,** particularly China, to expand influence in Southeast Asia.

3. Slower progress in ongoing negotiations and reduced diplomatic momentum **may weaken India's role in shaping Indo-Pacific architecture.**

Way Forward

1. India **must ensure consistent high-level representation at ASEAN** and East Asia Summits to reinforce its commitment to the region.
2. **Strengthening connectivity and economic integration measures**, including faster AITIGA reforms, will be essential to improve trade relations.
3. India should **expand maritime cooperation, digital connectivity, and defence partnership**s to counterbalance strategic competition.
4. Diplomatic **outreach must be proactive** to prevent any misperceptions regarding India's priorities.

Conclusion: ASEAN remains vital for India's strategic interests and regional stability in the Indo-Pacific. The missed opportunity at the Malaysia summit underlines the need for stronger, consistent, and visible diplomatic engagement by India in the ASEAN region.

Question: India's absence at the ASEAN Summit in Malaysia reflects a missed diplomatic opportunity in the Indo-Pacific. Discuss.

Rethinking Immigration in the Age of Exclusion

Source: The post **"Rethinking Immigration in the Age of Exclusion"** has been created, based on **"Rethinking Immigration in the Age of Exclusion"** published in "The Hindu" on 29th October 2025.

UPSC Syllabus: GS Paper-2- Governance

Context: Immigration has historically facilitated human survival, cultural exchange, and social progress. Contemporary politics, especially during the Trump administration in the United States, has transformed immigration into a source of fear, suspicion, and ideological conflict. This shift has weaponised immigration policies against vulnerable groups while neglecting the historical role of migration in nation-building.

Colonial History and Distorted Narratives

1. Colonial narratives, such as the **glorification of Columbus's "discovery" of America,** deliberately ignore the existence of advanced Indigenous civilisations.
2. Colonisation **destroyed vibrant societies by imposing foreign languages,** religions, and systems of governance for the extraction of wealth.
3. Colonial migration was not a peaceful settlement but **a tool of conquest, domination, enslavement, and forced displacement** of native populations.
4. Colonial powers **established racial hierarchies and property systems** that still structure today's global inequalities.

Link between Colonialism and Modern Anti-Immigration Politics

1. Current immigration restrictions are **rooted in historical practices** that treated non-European people as inferior and expendable.
2. **Powerful nations continue to obscure their role in creating conflict** and economic instability that drives forced migration.
3. **Migrants are criminalised and economically exploited** while being denied legal rights and social protection.
4. The **militarisation of borders presents migrants as threats to national security** rather than as human beings seeking dignity.

Political Construction of Fear and Suspicion

1. **Stereotyping and racial profiling** have resulted in **deep suspicion of migrants from Muslim-majority and war-affected regions** such as Syria, Afghanistan, and Sub-Saharan Africa.
2. **Public discourse increasingly frames immigration** as terrorism, crime, or disease, rather than as a humanitarian and developmental concern.
3. **Political leaders use anti-immigrant rhetoric** to gain power by generating fear and reinforcing xenophobic nationalism.
4. Despite being built by generations of migrants, societies like in U.S.A. **adopt exclusionary policies against new migrants.**
5. The **contributions of immigrants to economic growth, scientific progress, and cultural enrichment are often ignored** or erased.
6. This **selective historical memory enables governments to portray migrants as outsiders** rather than as part of national identity.

Ethical and Legal Dimensions

1. **Restricting the movement of people across borders** raises fundamental questions about human dignity and universal rights.
2. **Legal categories such as "illegal immigrant" fail to acknowledge** the moral legitimacy of migration as a basic human aspiration.
3. Immigration policies must shift **from punitive systems to rights-based frameworks** that recognise migrants' agency and humanity.

Way Forward

1. **Future immigration systems should confront historical injustices** that continue to shape migration patterns worldwide.
2. Governments should promote **humane refugee protections, fair pathways to citizenship**, and safeguards against exploitation.
3. Policymakers must **replace racialised and security-driven narratives** with inclusive, evidence-based, and humanitarian approaches.
4. Societies must **acknowledge that diversity strengthens economic development, i**nnovation, and global cooperation.

Conclusion: A just approach to immigration requires dismantling the exclusionary ideologies inherited from colonialism. Recognising the historical roots of migration can help reshape policy toward fairness, dignity, and equality. Migration should be treated not as a threat, but as a legitimate human right that reflects the shared history and future of humanity.

Question: Modern immigration policies often reflect the colonial legacy of exclusion, domination, and racialised control. Critically examine this statement in the context of contemporary global politics.

The Chimerica Challenge

Introduction

The US–China relationship is shifting from deep economic interdependence to strategic rivalry. **This change creates risk and opportunity for Asia, especially India.** A short truce in trade or technology will not erase structural contradictions. **India must avoid panic and passivity,** and instead build leverage through reforms, defence modernisation, and a clear technology strategy.

About Chimerica

Fusion of finance and factories: Chimerica describes the long phase when American capital and global markets combined with Chinese labour and manufacturing. This fusion powered world growth and reshaped supply chains.

It began after the 1972 US–China opening and deepened under China's reform and opening, as production scaled in China and consumption and finance scaled in the US.

Promise and limits: The idea assumed economic interdependence would soften political conflict. For years, it masked strategic differences. **But interdependence did not transform China's behaviour,** nor did it erase great-power competition.

Different Phases of Chimerica

Phase I: 1930s–1949 (Formation and WWII)

- The United States backed Chiang Kai-shek against Japan, and the United States and China became allies in World War II.
- China emerged among the victors and secured a permanent seat on the UN Security Council.
- India was internally divided: Gandhi declined Chiang's plea, Subhas Chandra Bose sought Japanese support, and Indian Communists backed the Allies.
- Because of these divisions, India missed the chance to shape the post-war order while China advanced.

Phase II: 1949–late 1960s (Early Cold War)

- After the Communist victory in 1949, the United States refused to recognise the People's Republic and backed Taiwan, while the Korean War deepened hostility and US alliances grew in East Asia.
- India championed Beijing's inclusion in the global order despite costs to ties with the United States.

• Even after the late-1950s rupture with China, India did not move closer to Washington and instead leaned toward Moscow.

Phase III: 1972–1990s (Rapprochement to "Chimerica")

• President Nixon's 1972 opening and the Shanghai Communiqué began US–China normalisation.

• Under Deng Xiaoping, China integrated with the world economy, and US capital combined with Chinese labour and global markets to create "Chimerica."

• India remained wary of the West and missed this wave of integration and growth.

Phase IV: 1991–2016 (Post-Soviet reorientation)

• US–China engagement deepened, and China's rise became faster and broader.

• India normalised relations with both the United States and China and undertook economic reforms.

• However, India retained an old balancing mindset with Russia and China, and China pulled ahead more rapidly.

Phase V: 2017–2024 (Open strategic rivalry)

• The United States formally labelled China a strategic rival, launched trade and technology restrictions, reshaped supply chains, and strengthened alignments with Japan, Australia, ASEAN, and India through the Quad.

• China became more assertive in the South China Sea, across the Taiwan Strait, and on the Himalayan border.

• Despite facing aggression on the border, India stayed cautious due to fear of entrapment in a US alliance and underused American support to narrow the power gap with China.

Phase VI: 2025 Busan moment (Truce, not peace)

• Trump and Xi are expected to announce a truce in trade and technology, which may calm markets but does not erase deep structural contradictions.

• The United States signals refinement, not reversal, through support for AUKUS, a strong US–Japan alliance, long-term ASEAN outreach, and plans to reduce dependence on Chinese critical minerals.

The Chimerica Challenge

• It refers to the current difficulties and potential breakdown of the symbiotic economic relationship between the United States and China, known as "Chimerica".

• This challenge is marked by escalating trade tensions, tariffs, export controls, and a move toward decoupling, driven by strategic competition between the two economic powers.

• The challenge involves figuring out how to navigate the consequences of this breakdown, which impact global economic growth and stability.

Impacts of the Chimerica Challenge

1. Effects on the United States

• **Tariffs raise production costs** for US firms, including multinationals that manufacture abroad. This pressure spreads across supply chains and reaches consumers.
• **Financial markets show stress** when policy signals are abrupt. Concerns also grow over the national research ecosystem if politicised cuts continue.

• In technology, **US leadership in design-heavy segments is real but vulnerable**, because barriers to entry are not insurmountable and foreign competition is rising.
• Industry lobbying **complicates stable deals**, while new probes and quotas create uncertainty for downstream sectors.

2. Effects on China

• **Exports are important but not decisive** for China's growth. The US share in China's exports has declined, and many leading Chinese firms earn most of their revenue at home.
• China **adapts through import substitution and third-country sourcing**. It also uses **counter-leverage in critical minerals** and targeted market access limits.

• These tools **increase Beijing's bargaining power** and signal staying power. There is **no evident appetite for a quick grand bargain**.

3. Effects on Southeast Asia and global supply chains

Policy swings create unpredictable shocks for ASEAN and other manufacturing hubs. Selective tariff exclusions help some segments, yet **new investigations threaten key nodes** such as semiconductors and electronics.
• Governments respond by **hedging**. They **engage China** to secure markets and inputs, while **managing a more volatile US stance** through ongoing policy adjustments. The result is **greater planning complexity** for both firms and states

Implications for India

1. **Strategic posture.** A US–China tactical truce raises concern about being sidelined, but enduring rivalry means India will operate in a competitive, not settled, order.
2. **Structural space.** Current balances create room for India to act, including on energy choices. The US needs India as a counterweight, even as pressure appears when interests differ.
3. **Limits of interdependence.** Economic interdependence alone will not moderate China's behaviour; trade will not resolve security frictions along the Line of Actual Control.
4. **Operating environment.** India will face alternating reassurance and pressure from partners, persistent border assertiveness from China, and shifting rules in technology and supply chains.

India's response

1. **End hesitation.** Assume oscillation will continue but rivalry will persist; act with purpose.

2. **Deeper economic reform.** Use reform to raise growth and build leverage.

3. **Defence-industrial modernisation.** Improve production, procurement, and R&D to narrow the power gap with China.

4. **Coherent technology strategy.** Organise critical technologies to reduce choke-point exposure and scale adoption.

5. **Partnership with the United States.** Proactively stabilise and advance ties to accelerate national transformation.

6. **Management of China.** Limit direct confrontation while widening space for selective cooperation.

7. **Policy discipline.** Track US–China engagements closely, resist panic and complacency, and focus on steady capacity-building.

Conclusion

Chimerica's glow has faded; the rivalry is structural. Even if trade and tech tensions pause, contradictions endure. India's task is clear: ignore summit theatre, build leverage through reform, defence modernisation, and technology strategy, deepen the US partnership, and manage competition with China without illusion.

Source: Indian Express

Urban planning is not just land-use planning

UPSC Syllabus Topic: GS Paper 1 -Society – Urbanization

Introduction

India needs cities that **drive growth, cut emissions, create jobs, and stay resilient**. A $30-trillion economy by 2047, **net-zero by 2070** with major **GHG cuts by 2030**, and a young workforce seeking livelihoods all converge in cities. Dense settlements are also **highly disaster-vulnerable**, as seen in the pandemic. Planning must therefore move beyond plot-wise land use to align **economy, resources, climate, mobility, and regional linkages** in one coherent frame.

Statistics on Urban India

1. According to the 2011 Census, the urbanisation rate in **India was 31.2%, which is expected to increase to 43.2% by 2035** (UN Habitat World Cities Report)

2. **Urban cities in India occupy just 3% of the land** but **contribute to ~60% of the GDP.**

3. **India is the second-largest urban system in the world**, with almost **11% of the total global urban population** living in Indian cities.

4. India's urban population is **expected to cross 50% of the total** population within the **next two decades.**

5. According to the Ministry of Finance, **one in-three poor people lives in urban areas**. This figure was about one-in-eight in the early 1950s.

6. According to the NITI Aayog **Report ~50% of India's statutory towns** are expanding **without any master plan** to guide their growth and infrastructure.

7. According to **Census 2011, 17.3% of the total urban population is living in slums.**

India's Approach Towards Urban Planning

1. Land-use approach: Modern planning grew from **19th-century public-health crises** and prioritised sanitation and **land-use control**. Zoning rules fixed how land parcels may be used, and changes require lengthy approvals..

2. Population-led provisioning: Cities are called **engines of growth**, yet master plans are **not derived from an economic vision**. They **project population from past trends** and size infrastructure accordingly.

3. Boundary-limited scope: Planning practice tends to **stop at municipal boundaries**. However, much urban growth occurs **outside city limits**, and urban economies are **interlinked with surrounding rural areas**. Smaller cities, crucial for **manufacturing with affordable land**, are rarely integrated into **regional plans**.

Concerns Related to India's Approach Towards Urban Planning

1. **Economic vision missing:** Without a **20–50-year economic vision**, land-use plans lack a credible basis. Cities cannot identify **future drivers of growth**, making investments and land allocation **misaligned with jobs and productivity**.

2. Mismatch with growth and jobs: People move to cities **for livelihoods**, yet plans are **environment-centric on land, not economy-centric on jobs**. Population-trend projections **underestimate job-led migration** in high-growth phases, risking **under-provisioned infrastructure**.

3. **Resource constraints Growing:** cities face **natural-resource shortages**. Current plans seldom **budget water, energy, and land** or **manage demand**. Ignoring **carrying capacity** creates **unsustainable pressures** on limited resources.

4. **Climate concern :** Cities must lead **emissions reduction** and **resilience**, but many lack **climate action plans** with pathways for **low-emission growth** and **vulnerability roadmaps**.

5. **Air pollution**, heavily affected by **transport**, persists without robust **environmental management** and **mobility** strategies.

Way forward

1. **Economic vision first:** Begin every plan with a 20–50-year economic roadmap that names city-specific growth drivers.

2. **Jobs-to-people logic:** Estimate population from projected jobs and then size land and infrastructure.

3. **Resource budgeting:** Map water, energy, and land balances. Use demand management to stay within carrying capacity.

4. **Climate action:** Prepare citywide pathways for low-emission growth and clear resilience measures.

5. **Air-quality and mobility:** Adopt an environmental management plan, with an air-pollution focus. Shift travel through a comprehensive mobility plan that favours public and non-motorised modes.

6. **Regional scale:** Plan beyond municipal limits, recognise urban–rural linkages, and include smaller cities in a single regional strategy.

7. **Enabling reforms:** Update planning laws and retool education to build the multidisciplinary talent this approach needs.

Conclusion

Cities are pivotal to growth, climate goals, jobs, and resilience. A **land-use-only model is inadequate**. Planning must **pivot to economic visioning**, **resource budgeting**, **climate and air-quality action**, **sustainable mobility**, and **regional integration**, supported by **legal and educational reforms**. This shift will **re-position cities as true "economic growth hubs"** for **Viksit Bharat**.

For detailed information on **Urban Planning and Development** read this article here

Question for practice:

Examine India's approach to urban planning, identify the key concerns arising from it, and suggest a clear way forward.

Source: **Indian Express**

Constitution (130th Amendment) Bill and Issues Related

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

Introduction

The Bill amends **Articles 75, 164, and 239AA** to link a Minister's continuance in office to **arrest and 30 days' custody**. It is before a **Joint Parliamentary Committee**. The core debate is whether **custody-based removal**—prior to trial—safeguards constitutional morality or **risks misuse** and disrupts governance.

Key Provision of Constitution (130th Amendment) Bill

1. **Articles targeted: It proposes amendments to Article 75, Article 164, and Article 239AA**, covering the Union Council of Ministers, State Councils of Ministers, and the special administrative provisions for Delhi. .

2. **Removal mechanism and timelines**

If a Minister is arrested and remains in custody for thirty consecutive days for an offence punishable with imprisonment of five years or more, removal follows.

The **President** (on advice of PM or directly) must remove a Union Minister or the Prime Minister.

The **Governor** (on advice of CM) must remove State Ministers.

The **Governor** (directly) must remove a Chief Minister.

For Union Territories (including Delhi and J&K), similar removal provisions will apply under amended Articles and relevant laws.

3. **Targeted Offices:** The Bill applies to the Prime Minister and Union ministers at the central level, as well as Chief Ministers and state ministers in states and Union Territories.

4. **Focus on Detention, Not Conviction:** A core and highly debated aspect is that the minister's removal would be based on the duration of their detention, **NOT** on a final conviction in a court of law. The Bill's "statement of objects and reasons" claims this is necessary to uphold constitutional morality and public trust in governance.

5. **Provision for Reappointment:** The Bill does not prevent a minister who has been removed from being reappointed to the same office once they are released from custody, regardless of whether they have been acquitted.

Major Concern Related to Constitution (130th Amendment) Bill

1. **Subjectivity in bail decisions:** Bail may also depend on the judge's liberty stance under Article 21. This injecting subjectivity into a rule that directly affects democratic representation and executive continuity.

2. **Misalignment with default bail:** Default bail is a right if the investigation is **not completed within 60–90 days** of custody (CrPC Section 167(2) / BNSS Section 187). The Bill triggers removal after **30 consecutive days** in custody. Since courts commonly extend remand within the 60–90 day window, the **30-day trigger sits earlier than the default-bail safeguard**, creating a mismatch.

3. **Removal before trial concludes:** Courts decide bail using the triple test (flight risk, evidence tampering, witness intimidation). In practice, they also consider the **gravity of the offence**. This often keeps an accused in custody **beyond short periods in heinous offences**. Under the Bill, longer custody **raises the chance of crossing 30 consecutive days**, which **activates removal from office**, even before trial concludes.

4. **Undermining presumption of innocence**: A significant criticism is that the bill equates arrest with guilt, removing the fundamental principle that an individual is innocent until proven guilty in a court of law.

5. **Political manipulation**: There are concerns that the bill could be used to target political opponents, as the power to remove ministers could be influenced by executive and political considerations rather than strict legal grounds.

6. **Risk of executive overreach**: Critics fear the bill gives too much power to the executive branch, as the removal of a minister depends on the advice of the Prime Minister or Chief Minister.

7. **Potential for arbitrary removal**: The 30-day period is considered arbitrary and not based on a clear legal or policy rationale. It could also prompt strategic delays in bail hearings to trigger removal from office.

8. **Impact on the legal process**: The bill may disregard specific legal protections and provisions, particularly for cases under special statutes with stringent bail conditions like the PMLA, where the burden of proof is reversed onto the accused.

9. **Risk to federalism**: The bill could have an impact on the structure of union and state cabinets, raising concerns about federal principles and potentially enabling the destabilization of coalition governments.

10. Influence of office and bail: If the Minister **stays**, courts may fear influence over the case, **bail may be denied**, and **removal follows after 30 days' custody**. If the Minister **resigns**, **bail may be easier**, but **the office is lost**.

Varies judgement related to Minister Arrest

1. **Deenan v. Jayalalithaa (Madras HC, 1989)**
In this case, the High Court held that "may arrest" in Section 41 CrPC denotes discretion, not compulsion, and refused to direct the police to arrest during investigation.

2. Joginder Kumar v. State of U.P. (SC, 1994)
In this case, the Supreme Court held that **no arrest should be made merely because the power exists**. The police must **justify the arrest**.

3. **Amarawati v. State of U.P. (Allahabad HC, 2004)**
In this case, the High Court, after examining Sections 41 & 157 CrPC, held that **arrest in a cognisable offence is not mandatory**. The police may **investigate first and arrest only if required**.

4. CrPC amendment, 2009 (legislative change)
Parliament **tightened arrest conditions in Section 41 CrPC**, distinguishing **≤7 years** from **>7 years** offences. **Section 41A CrPC** still enables **appearance by notice** when custody is **not necessary**, irrespective of offence length.

5. **Satender Kumar Antil v. CBI (SC, 2022)**
In this case, the Supreme Court held that **investigating agencies are bound** to follow **Section 41/41A CrPC** safeguards**.** Non-compliance undermines personal liberty safeguards.

6. **Arnesh Kumar v. State of Bihar (SC, 2014)**
In this case, the Supreme Court mandated that the investigating officer must **record reasons and material** justifying arrest, and High Courts have **objected to violations** of these directions.

7. National Police Commission, 3rd Report (1977)
The Commission reported that **nearly 60% of arrests were unnecessary or unjustified**. This heightens concern about **misuse of arrest**—a crucial risk when the Bill's **30-day custody trigger** can remove Ministers from office **before trial concludes**.

Conclusion

The Bill **creates a custody-based removal rule** to protect **constitutional morality**, yet raises **serious risks**: **discretionary arrests**, **bail-law frictions**, **special-statute burdens**, and **federal instability**. **Clarifying safeguards**, **aligning with default-bail timelines**, and **strict arrest-protocol compliance** are essential to balance **accountability and liberty**.

For detailed information on **Constitution (130th Amendment) Bill – Provisions & Criticisms** **read this article here**

Question for practice:

Examine the major concerns related to the Constitution (One Hundred and Thirtieth) Amendment Bill.

Source: **The Hindu**

The Cough Syrup Catastrophe

UPSC Syllabus Topic: GS Paper 2 -Issues relating to development and management of Social Sector/Services relating to Health.

Introduction

India has seen repeated child deaths from contaminated cough syrups. In **October 2025, 27 children** died in **Madhya Pradesh and Rajasthan** after consuming **Coldrif** and another **dextromethorphan-based syrup**. **WHO confirmed diethylene glycol (DEG) up to 48.6%** in Coldrif. The pattern is not new. **Indian-made syrups** were earlier linked to deaths in **The Gambia and Uzbekistan**, with similar crises in **Indonesia and Cameroon**. The crisis exposes **deep failures in regulation, enforcement, and medical practice**.

Reasons for Recurrent Child Deaths from Cough Syrups

1. **Toxic solvent substitution:** Some manufacturers replace safe solvents like **propylene glycol or glycerin** with **diethylene glycol (DEG) or ethylene glycol** to cut costs. These chemicals **damage kidneys and the nervous system**. **Children are highly vulnerable**, so poisoning is rapid and often fatal.

2. **Uneven enforcement:** Action varies across states. **Tamil Nadu** shut Sresan Pharmaceuticals and cancelled its licences. **Gujarat** recalled syrups without arrests. This inconsistency lets **rogue firms exploit gaps**.

3. Underpowered national regulator: The **CDSCO** oversees a **$50-billion industry** but is **understaffed, underfunded, and compromised**. **Inspections were reactive, not preventive**. Pharmacovigilance exists but is **underused and overwhelmed**.

4. **Perverse incentives in prescribing:** A doctor was **arrested for prescribing Coldrif** and admitting to **commissions from the company**. Such incentives promote **overprescription** despite **paediatric safety guidance**, which is **poorly enforced**.

5. **Flawed licensing and surveillance:** The **2021 online drug licensing system** has not curbed adulteration. **Signals from hospitals and citizens** rarely trigger **swift recalls, targeted audits, and prosecution**.

6. **Light penalties, slow justice:** The **Drugs and Cosmetics Act, 1940** imposes **paltry penalties—fines as low as ₹1 lakh**, low compared to profits. **Sresan Pharmaceuticals's owner faces manslaughter charges**, but **delayed trials blunt deterrence**.

7. **Export–domestic double standard:** India **tightened export scrutiny** after deaths abroad, but **domestic markets remain poorly policed**. **Poor families** relying on **cheap generics** carry the highest risk from **untested potions**.

Initiatives Taken to Curb Contamination.

1. Rapid bans: Madhya Pradesh first banned Coldrif on October 2. The ban became **nationwide by October 11**, removing the suspect syrups from shelves.

2. **Expert committee: Rajasthan** set up an **expert committee**. The **Indian Council of Medical Research** joined a **multidisciplinary investigation** to trace sources and failures.

3. **Digital monitoring system:** In **October 2025**, the **CDSCO** launched a **digital monitoring system** on the **Online National Drug Licensing System (ONDLS)** portal. This system **tracks the supply chain of high-risk solvents**like propylene glycol, requiring manufacturers to obtain licenses and **upload batch details for real-time monitoring**.

4. Strengthened manufacturing practices: The government has **mandated strict compliance with revised Schedule M** of the Drugs and Cosmetics Act by **December 31, 2025**. The new rules **align with global GMP** and require manufacturers to enhance **quality systems, supply chain traceability, and testing for DEG and EG**.

5. **Increased testing and surveillance:** The **Indian Pharmacopoeia Commission (IPC)** is launching a **nationwide training program** for drug laboratories to improve their ability to **detect toxic contaminants** using **advanced techniques like gas chromatography**.

6. Targeted inspections: The **CDSCO** has ordered **nationwide, risk-based inspections and audits** of all cough syrup manufacturing units.

7. **Traceability measures:** The government **plans to mandate QR code-based traceability** for specific drugs, including cough syrups, to strengthen the fight against **counterfeit and substandard medicines**.

8. Restrictions on use: In response to contamination risks, **advisories were issued** to states and union territories against **prescribing cough-cold syrups for children under five years old**.
9. **Export checks:** Following deaths in The Gambia and Uzbekistan, **export scrutiny was tightened**. **USFDA and the US embassy confirmed no implicated exports** reached the United States.

10. **Global coordination: WHO offered investigative support** and termed the contamination **criminal**. Engagement with **WHO** remains essential for **standards and alerts**.

Way forward

1. Strengthen regulation and testing: Empower CDSCO with **independent funding**, a **larger inspectorate**, and **transparent governance**. **Mandate verifiable batch-wise quality certificates** from accredited labs before release.

2. **Accountability and deterrence: Raise penalties** for adulteration to meaningful levels. **Blacklist and prosecute** negligent firms. **Protect whistleblowers** to surface malpractice early.

3. Clinical practice and surveillance: Disclose doctor commissions, enforce **paediatric guidelines**, and **penalise non-compliance**.

4. **Strengthen pharmacovigilance:** Create and promote a **robust adverse drug reaction reporting system** that allows healthcare facilities and patients to **report negative outcomes promptly**.

5. Raise public awareness: Educate caregivers and the public about the risks of **contaminated medicines**, the importance of only **buying from verified sources**, and how to **spot a dubious product**.

6. **Close the domestic–export gap:** Apply the **same strict standards at home** that are used for exports. **Uniform state enforcement** must replace fragmented action to end **regulatory arbitrage**.

7. **Foster global collaboration**
• **Strengthen international cooperation:** Partner with the **World Health Organization (WHO)** and other global bodies to create **faster alert systems** for contaminated products and to **build capacity in low-resource settings**.
• **Enforce global standards:** Adhere to and benchmark against **WHO guidelines** for manufacturing and testing to ensure **consistently high standards** for both domestic and exported medicines.

Conclusion

This is a systemic failure, not an accident. Profit-driven adulteration, **weak laws**, **fragmented enforcement**, and **perverse prescribing incentives** created a **deadly chain**. **Manufacturers and policymakers share responsibility** for the **27 child deaths**. India's pharmaceutical success cannot rest on domestic neglect. Only **independent regulation, rigorous testing, real deterrence, ethical prescribing, and uniform enforcement** can **prevent the next cough syrup tragedy**.

Question for practice:

Discuss the reasons behind recurrent child deaths from contaminated cough syrups in India and the key initiatives taken to curb such contamination.

Source: **The New Indian Express**

A decade after Paris accord, an unstoppable transition

Source: The post **"A decade after Paris accord, an unstoppable transition"** has been created, based on **"A decade after Paris accord, an unstoppable transition"** published in "The Hindu" on 30th October 2025.

UPSC Syllabus: GS Paper -3-Environment

Context: The **Paris Agreement**, adopted at **COP21 in 2015**, represents the most significant global effort to combat climate change. It **aims to limit global temperature rise to well below 2°C and pursue efforts to restrict it to 1.5°C.** Ten years later, although emissions continue to rise, the Paris Agreement has triggered an irreversible transition toward a sustainable and low-carbon world.

Achievements and Impact

1. The Paris Agreement has shown that **collective international cooperation can influence the global climate trajectory**.
2. Before its adoption, the world was heading toward a **4°C–5°C temperature rise** by 2100, but this has been reduced to **approximately 2°C–3°C** through global efforts.
3. It has encouraged **differentiated responsibilities**, respecting the diverse capabilities of developing and developed countries.
4. The Agreement has **accelerated the renewable energy revolution**, making solar, wind, and hydroelectricity the most competitive sources of new power.
5. **Electric mobility and battery technology** have progressed rapidly, and electric vehicles now constitute nearly **20% of global new car sales**.
6. The global energy shift has also **created jobs, enhanced energy security**, and improved **national sovereignty** for many developing countries.

Example of Effective Multilateralism (ISA)

1. The **International Solar Alliance (ISA)**, co-founded by **India and France** at COP21, exemplifies how multilateralism under the Paris Agreement can drive real progress.
2. It has grown into a coalition of over **120 member countries**, promoting **capacity building, training, and financial support** for solar transitions.
3. At the **8th ISA Assembly in 2025**, co-chaired by India and France, the alliance reaffirmed its mission to **make solar energy accessible to all**.
4. India's strong commitment to renewable energy is evident, as more than **50% of its installed electricity capacity** now comes from non-fossil sources, well ahead of the 2030 target.
5. India also aims to achieve **net-zero emissions by 2070** and pursue a **low-carbon development pathway** under the vision of *"Viksit Bharat 2047."*

Challenges in the Post-Paris Decade

1. **Global emissions continue to rise**, and the current national commitments (NDCs) remain inadequate to meet the 1.5°C target.
2. **Developing countries face financial constraints**, as developed nations have **not fulfilled their $100 billion annual climate finance commitments**.
3. **Adaptation measures remain underfunded**, leaving vulnerable regions exposed to climate disasters such as floods and heatwaves.
4. **Dependence on fossil fuels** still persists, especially in emerging economies where coal and oil dominate the energy mix.
5. **Climate misinformation and weak governance** reduce public trust and hinder effective policy implementation.
6. **Technological and intellectual property barriers** limit the transfer of clean technologies to developing countries.

Way Forward

1. The world must **accelerate collective emission reduction efforts** and adopt ambitious, science-based national targets.

2. There should be a **just and inclusive transition**, prioritising adaptation, resilience, and support for vulnerable communities through mechanisms like the **Green Climate Fund**, **Loss and Damage Fund**, and **CDRI**.
3. **Protection of natural carbon sinks**, including forests, mangroves, and oceans, must become a central strategy in global climate action.
4. **Empowering local governments, businesses, and civil society** is essential to translating climate goals into action on the ground.
5. **Defending climate science** and strengthening institutions like the **IPCC** are vital to combat disinformation and ensure evidence-based policy.
6. Developed nations should ensure **predictable and equitable climate finance** to bridge the implementation gap.

Conclusion: The transition initiated by the Paris Agreement is **unstoppable** because it has become a necessity for human survival and economic progress. It is unstoppable because **industries, markets, and governments** are increasingly aligning with sustainability. It is unstoppable because **multilateralism**, as seen in the ISA, continues to drive cooperation and innovation. Despite persistent challenges, the Paris Agreement has irreversibly placed the world on a path toward a **low-carbon, resilient, and inclusive global future**.

Question: Assess the impact of the Paris Agreement on global climate action and explain why the transition it began is considered unstoppable.

China's complaint against India at WTO

Source: The post **"China's complaint against India at WTO"** has been created, based on **"China's complaint against India at WTO"** published in "The Hindu" on 30th October 2025.

UPSC Syllabus: GS Paper -2-Effect of Policies and Politics of Developed and Developing Countries on India's interests

Context: Recently, China filed a formal complaint against India at the **World Trade Organisation (WTO)**, alleging that India's **Production-Linked Incentive (PLI) Scheme** violates WTO subsidy rules. China claims that the scheme offers **prohibited subsidies** that are contingent on the use of **domestic inputs** rather than imported goods, thereby breaching **global trade norms**. The case raises critical questions about the **compatibility of India's industrial policy** with international trade law and the space available for **developing countries** to pursue **self-reliant growth strategies**.

What is the PLI Scheme?

1. The **PLI Scheme**, launched in **2020**, aims to transform India into a global manufacturing hub by offering **financial incentives** to firms based on **incremental production and sales** within the country.
2. The scheme covers multiple sectors and seeks to:
    - **Enhance domestic manufacturing capabilities**,
    - **Integrate Indian industries into global value chains**, and
    - **Promote innovation, employment, and exports**.
3. The **three specific PLI components** challenged by China include:
    - **Advanced Chemistry Cell (ACC) Battery Manufacturing** – to promote giga-scale battery production,

- **Automobile and Auto Component Manufacturing** – to boost EV adoption,
- **Electric Vehicle (EV) Manufacturing** – to attract global EV makers.

What is China's Complaint?

1. China alleges that India's PLI schemes **violate WTO obligations** by linking subsidies to **domestic value addition (DVA)** and the **use of locally sourced goods**.
2. For instance, under the **auto sector PLI**, companies must achieve a **minimum of 50% domestic value addition** to qualify for financial benefits.
3. China contends that such local content requirements **discriminate against imported goods**, violating the **National Treatment Principle** under **Article III:4 of GATT 1994** and **Article 2.1 of the TRIMs Agreement**.
4. It argues that these conditions constitute **prohibited subsidies** under **Article 3.1(b) of the Subsidies and Countervailing Measures (SCM) Agreement**, as they are **contingent upon the use of domestic over imported goods**.

Relevant WTO Provisions

1. **General Agreement on Tariffs and Trade (GATT) 1994 – Article III:4:** Mandates equal treatment between domestic and imported products.
2. **Trade-Related Investment Measures (TRIMs) Agreement – Article 2.1:** Prohibits investment measures inconsistent with national treatment, such as local content requirements.
3. **Subsidies and Countervailing Measures (SCM) Agreement – Articles 3 & 5**
   - Classifies subsidies into **prohibited**, **actionable**, and **non-actionable** categories.
   - Prohibited subsidies are those tied to **export performance** or the **use of domestic goods**.
4. China, therefore, argues that India's PLI falls into the **"prohibited" category**, as it may distort trade and disadvantage foreign manufacturers.

India's Defence

1. India maintains that its **PLI incentives are not contingent on domestic sourcing** in a manner that violates WTO rules.
2. The **value addition criteria** are part of broader national industrial performance metrics and do not directly impose local content requirements.
3. India argues that **industrial subsidies** are a **legitimate policy tool** for development, recognised under WTO rules for developing countries.
4. The scheme intends to **boost competitiveness, innovation, and employment**, not to discriminate against foreign products.
5. India also highlights the **precedent of similar subsidy programs** in advanced economies, for instance, **U.S.A. Inflation Reduction Act (IRA)** and the **EU's Green Deal Industrial Plan**, both of which provide large-scale industrial subsidies.

Challenges

1. **Legal Vulnerability** – If the WTO panel rules in China's favour, India might have to **revise or withdraw** certain parts of the PLI scheme.
2. **Industrial Policy Constraints** – A ruling against India could **restrict its policy space** for future industrial strategies aimed at self-reliance.

3. **Precedent Risk** – Successive complaints from other WTO members could **undermine India's incentive-based industrial model**.
4. **Diplomatic Tensions** – The case may **escalate trade tensions with China**, already strained due to geopolitical disputes.
5. **Weak WTO Enforcement** – With the **Appellate Body non-functional since 2019**, dispute resolution might be delayed, leaving the issue unresolved for years.
6. **Investor Uncertainty** – Ongoing disputes may **create ambiguity** for firms investing under the PLI scheme, affecting investor sentiment.
7. **Balancing Developmental and Trade Commitments** – India faces the challenge of **maintaining developmental policy autonomy** while complying with global trade rules.

Way Forward

1. **Robust Legal Defence** – India must prepare a **strong legal argument** emphasising that the PLI scheme rewards **output and performance**, not domestic sourcing.
2. **Policy Calibration** – The government may **refine eligibility criteria** to avoid any direct link between subsidies and local content.
3. **Diplomatic Negotiation** – Engage in **constructive consultations** with China and other WTO members to seek a diplomatic resolution.
4. **Global Alliance for Reform** – India should **ally with developing and emerging economies** to advocate for **reform of WTO subsidy rules**, ensuring greater policy space for developmental support.
5. **Transparency and Notification** – India must regularly **notify WTO bodies** about its schemes and maintain transparency to strengthen its credibility.
6. **Encouraging Self-Sufficiency Through Competitiveness** – Focus on **innovation, infrastructure, and skill development** so that domestic industries become globally competitive without heavy reliance on subsidies.
7. **Strategic Communication** – India should actively project that its industrial incentives aim at **sustainable growth and global supply chain integration**, not protectionism.

Conclusion: China's complaint against India at the WTO is a **test case for reconciling developmental industrial policy with global trade disciplines**. While India's PLI scheme has been crucial for **boosting domestic manufacturing and energy security**, it must be **aligned with WTO principles** to avoid disputes and maintain international credibility. The challenge lies in balancing **Atmanirbhar Bharat** objectives with **multilateral trade commitments**. By defending its policies with clarity, engaging diplomatically, and leading the call for **modernising WTO subsidy frameworks**, India can safeguard both its **economic sovereignty and global trade legitimacy**.

Question: What is China's complaint against India at the WTO regarding the Production-Linked Incentive (PLI) Scheme? Discuss the relevant WTO provisions, associated challenges, and the way forward for India.

AI's rewriting of the rules of education

UPSC Syllabus Topic: GS Paper-2- Issues Relating to Development and Management of Social Sector/Services relating to Education, Human Resources.

Introduction

India is preparing to introduce **Artificial Intelligence (AI)** from **class three in the 2026–27 academic year**, in line with the **National Education Policy (NEP) 2020**. The plan aims to build a strong **K–12 framework—**

that is, the entire schooling system from **kindergarten to class 12**—where AI is woven into every stage of learning. This move seeks to equip students with **future-ready digital skills**, promote **personalised and inclusive education**, and prepare them for a **technology-driven economy**.

Significance of Introducing AI in Education in India

1. Personalisation: AI studies how each student learns and adapts lessons to their pace and needs. It gives extra practice where a student struggles and offers advanced tasks when they are ready.

2. Inclusion: AI tools support many Indian languages and assist learners with disabilities. Customised content helps create fair access to learning across regions and abilities. Also highlight the important aspects in the summary.

3. Teacher augmentation: AI automates attendance, grading, and other routine work. Teachers can then focus on discussion, creativity, and critical thinking with students.

4. Smarter lesson design & real-time feedback: AI helps teachers design lesson plans and classroom resources. It also provides quick feedback so teaching can adjust to what students understand in the moment.

5. Early AI literacy: Introducing AI from class three builds basic comfort with modern tools. Students learn problem-solving and responsible use of AI from an early age.

6. Workforce readiness: AI may replace some roles, but it is expected to create more jobs by 2030. Early exposure prepares students to adapt and gain skills for new opportunities.

7. Momentum in higher education: Many higher education institutes already use generative AI for teaching support. Chatbots, interactive quizzes, and personalised materials make learning more engaging.

8. System-level scaling: Large-scale teacher training and pilot projects show a path to wider adoption. With careful rollout, AI can help reduce learning gaps across India's diverse classrooms.

Challenges of Introducing AI in Education in India

1. Reduced human interaction: Over-reliance on AI can diminish the vital role of human empathy, mentorship, and social interaction between teachers and students.

2. Weakened critical thinking: Students may become overly dependent on AI tools, which could hinder the development of their own critical thinking and problem-solving skills.

3. Teacher training: India must upskill over one crore educators. Converting teachers into confident AI guides is a mammoth task, and readiness varies.

4. Integration challenges: Integrating AI seamlessly with existing educational systems and curriculum is a significant technical and pedagogical hurdle.

5. Managing disruption: AI's classroom gains arrive with workforce disruption. Schools must prepare learners for jobs that do not yet exist.

6. Data privacy: AI systems in education collect large amounts of student data, creating risks related to how this data is stored, accessed, and used, as well as potential security breaches.

7. Algorithmic bias: AI algorithms can perpetuate existing societal biases found in their training data, potentially leading to unfair treatment or outcomes for different student groups.

8. Digital divide: The cost and lack of infrastructure in rural areas can create an unequal playing field, where students in well-resourced schools benefit while others are left behind.

Initiative Taken to Introducing AI in Education in India

The Indian government has launched several key initiatives to integrate Artificial Intelligence (AI) into the national education system, guided by the National Education Policy (NEP) 2020.

1. **Skilling for AI Readiness (SOAR) Program:** This national program, launched by the Ministry of Skill Development and Entrepreneurship (MSDE), targets students from Class 6 to 12 and educators. It provides structured modules (three 15-hour modules for students, one 45-hour module for educators) focused on foundational AI concepts, ethical use, and basic machine learning.

2. **AI in School Curriculum (CBSE):** The Central Board of Secondary Education (CBSE) introduced AI as an elective subject in Class 9 starting from the 2019–2020 academic session, later extending it to Class 11. The curriculum is designed to foster AI literacy and practical application skills, and from the 2026–27 academic session, AI education will be introduced for all students from Class 3 onwards.

3. **AI Centres of Excellence (CoE):** The Union Budget 2025–26 allocated funds to establish a Centre of Excellence in AI for education. This center will serve as a national hub for research, development of context-sensitive AI tools, and integration of AI into teaching and learning processes in higher education institutions (HEIs).

4. IndiaAI Mission: Approved in March 2024 with a significant budgetary outlay, this mission aims to build a robust AI ecosystem. Key pillars include:

- **India AI Future Skills:** Focuses on developing AI-skilled professionals by offering fellowships, establishing Data and AI Labs in Tier 2 and Tier 3 cities, and reskilling IT manpower.

- **AI Application Development Initiative:** Promotes the creation of AI solutions for India-specific challenges, including assistive learning technologies in education.

5. Atal Innovation Mission (AIM): Launched by NITI Aayog, the Atal Tinkering Labs (ATL) initiative nurtures creativity and innovation in robotics and AI among school students through hands-on experiential learning.

6. Collaborations: The government is working with tech giants like Intel, IBM, Microsoft, and Google to train teachers and develop AI-integrated course materials. MoUs have also been signed with premier institutions like IITs and NITs to offer AI-related courses and training programs.

Conclusion

Introducing AI early offers personalised learning, greater inclusion, and stronger teacher support while building future-ready skills. Success will depend on large-scale teacher training, equitable infrastructure, clear

data safeguards, and phased pilots. With careful policy design and ethical oversight, AI can expand access and quality without leaving disadvantaged learners behind.

Question for practice:

Examine the significance and the main challenges of introducing AI across India's education system.

Source: The Hindu

Merging PSU Banks

UPSC Syllabus Topic: GS Paper 3 -Indian economy

Introduction

India's PSB policy currently prioritises **organic growth, governance, and technology** with **no immediate mergers**. Earlier consolidation **reduced PSBs from 27 to 12**, aligning with **Narasimham Committee-II (1998)**, which envisaged **fewer, larger, stronger banks** under a three-tier structure. The next phase should build capacity for **well-structured, large-ticket lending** while safeguarding **outreach** and **financial inclusion**.

Reasons for PSU Banks Mergers

1. **Addressing financial weaknesses:** High **NPAs** and **low capital** in smaller PSBs can be stabilised by merging with stronger banks, enabling better **asset management**, **securitisation**, and **refinancing**.

2. **Enhance efficiency and supervision: Economies of scale**, **branch rationalisation**, common administration, and **technology integration** raise efficiency; fewer, larger PSBs ease **RBI supervision** to **uniform standards**.

3. **Credit capacity and competitiveness:** Larger capital bases **lift lending capacity** across infrastructure, SMEs, and retail; scale can strengthen **ratings** and lower **funding costs**.

Significance of PSU Banks Mergers

1. Economic growth and large-scale financing: Bigger entities can **finance major infrastructure** essential for development.

2. **Enhanced efficiency and cost reduction: Consolidating overlaps** in branches and systems lowers costs and streamlines operations.

3. **Stronger balance sheets:** Pairing weaker with stronger banks **improves balance sheets** by tackling **NPAs** and enlarging **capital**.

4. **Increased competitiveness: Well-capitalised** large banks compete better with private peers and are **more resilient** to economic shocks.

5. Wider customer and product base: Mergers **expand reach** and enable a **broader product suite** from a single platform.

6. **Improved risk management:** A larger entity can better manage liquidity and adopt more sophisticated risk management strategies.

Concern Related to PSU Banks Mergers

1. Cultural and Operational Differences: Each bank has its own work culture, management style, and operational systems. Integrating these different cultures and systems can be a complex and time-consuming process.

2. Technological Integration: Merging banks often operate on different banking platforms.Integrating these technologies requires careful planning, significant investment in IT infrastructure and testing in order to make sure that there is no disruption in services.

3. Diluted managerial efficiency: Merging stronger banks with weaker ones can dilute the efficiency of the stronger banks, potentially increasing operational risks and impacting performance.

4. Branch rationalization: Mergers can lead to the closure of overlapping branches, potentially affecting the reach of PSBs in rural and semi-urban areas.

5. Diluted financial inclusion: The focus on regional and local lending priorities for sectors like agriculture and MSMEs may be diluted in a large, consolidated entity.

6. Systemic risk: Creating a "too big to fail" institution could pose a systemic risk to the economy, as the government might have to bail it out in a crisis.

7. Service disruption: Customers often face short-term disruptions like changes to account numbers, IFSC codes, and cheque books, which can lead to temporary service glitches and blocked funds.

Way forward

1. Boost risk capacity: Allocate capital and systems to raise risk appetite and expand asset portfolios for large infrastructure lending. This widens lending capacity for viable projects while keeping balance sheets resilient.

2. Better Structure of loans: Use permitted risk-weight adjustments. Combine non-fund-based limits with funded facilities to enable phased, bankable financing. Synchronise disbursements with project milestones to manage risk.

3. Tighten oversight: Strengthen appraisal, monitoring, early-warning tools, and covenants so mega projects stay on track. This reduces slippages and protects asset quality.

4. Ownership tweaks: Consider raising the FDI cap above 20% and aligning voting rights beyond 10%, while keeping the Government's 51% stake.

5. Shift to NOFHC: Move to a Non-Operative Financial Holding Company structure to separate ownership from management and improve transparency and autonomy.

6. Sequence consolidation: Prioritise governance, technology, and outreach improvements now. Plan any new mergers only after these reforms deliver results, since mergers combine balance sheets but do not create value by themselves.

Conclusion

Prioritise governance, technology, and risk systems across the 12 PSBs to safeguard **outreach and inclusion** and build capacity for **large, well-structured lending**. **Consider consolidation only after these reforms show results**, so any merger **adds scale without weakening service quality**, strengthens **balance sheets and oversight**, and supports **sustained infrastructure financing**.

Question for practice:

Discuss the rationale, benefits, and concerns associated with the merger of Public Sector Banks (PSBs) in India.

Source: Businessline

Debt Sustainability of States

Source: The post **"Debt Sustainability of States"** has been created, based on **"Debt Sustainability of States - A Complex Issue"** published in "The Hindu" on 31st October 2025.

UPSC Syllabus: GS Paper -3-Indian Economy

Context: Debt sustainability of Indian States refers to their capacity to service debt without compromising developmental expenditure or resorting to excessive future borrowing. The FRBM Review Committee (2017) and the 15th Finance Commission prescribed uniform fiscal targets for both the Centre and the States. However, given wide inter-state variations in growth, income, and spending patterns, a one-size-fits-all approach may not be suitable to assess debt sustainability.

RBM and Finance Commission Targets

1. The FRBM Committee recommended limiting total public debt to 60 per cent of GDP by 2023 (40 per cent for the Centre and 20 per cent for States).
2. It emphasised that governments should not borrow for current expenditure and that fiscal deficit should act as the key operating target.
3. The 15th Finance Commission, post-COVID, set targets for States' fiscal deficit at 2.8 per cent of GSDP and fiscal liabilities at 30.9 per cent by 2024–25, along with a revenue surplus goal.

Debt Trends across States

1. States' overall debt increased from 22.8 per cent of GSDP in 2011–12 to 31 per cent in 2020–21, moderating to 28.8 per cent by 2024–25.
2. However, large variations exist across States — from 16.3 per cent in Odisha to over 57 per cent in Arunachal Pradesh.
3. These disparities highlight differences in economic growth, fiscal capacity, and expenditure priorities, making uniform benchmarks unrealistic.

Multi-Parameter Approach to Debt Sustainability

1. Debt sustainability depends on how productively borrowings are used and whether the return on debt exceeds its cost.

2. A higher debt–GSDP ratio may still be sustainable if debt is invested in infrastructure and productive capital formation.
3. The study proposes a composite **Debt Sustainability Index** based on five criteria:
    a. **Domar Gap:** Difference between GSDP growth and interest rate.
    b. **Debt Buoyancy:** Difference between GSDP growth and debt growth.
    c. **Debt-to-GSDP Ratio:** Traditional measure of debt stock.
    d. **Debt-to-Revenue Receipt Ratio:** Indicates repayment capacity.
    e. **Capital Expenditure-to-Debt Ratio:** Reflects productive use of borrowings.
4. The first four parameters are given 15 per cent weight each, and the fifth, reflecting asset creation, carries 40 per cent weight.

Key Findings

1. The debt-to-GSDP ratio and the sustainability index show limited correlation.
2. Only Punjab and West Bengal have index values below 0.2, while Odisha scores above 0.9, indicating strong fiscal sustainability.
3. Sixteen States with index values above 0.6 are considered fiscally prudent, showing effective debt management despite higher debt ratios.
4. During 2021–2025, GSDP growth exceeded the average interest rate by about 8 per cent, indicating solvency.
5. Debt-to-revenue receipts ratio varies from 0.8 in Arunachal Pradesh to 3.6 in Punjab, showing wide repayment differences.
6. In eleven States, including Punjab, Kerala, and Tamil Nadu, debt exceeds cumulative assets, indicating inefficient use of borrowings.

Challenges in Ensuring Debt Sustainability

1. **Inter-State Variations:** Diverse growth rates, income levels, and fiscal capacities make uniform debt limits unrealistic.
2. **High Revenue Expenditure:** States often borrow to meet current expenditure, reducing funds for capital formation.
3. **Weak Debt Utilisation:** In many States, borrowings are not efficiently used for asset creation.
4. **Limited Revenue Base:** Dependence on central transfers and low own-tax revenue restrict fiscal autonomy.
5. **Interest Burden:** Rising debt servicing costs reduce fiscal space for development spending.
6. **Populist Policies:** Competitive welfare schemes and subsidies increase fiscal stress.
7. **Lack of Transparency:** Off-budget borrowings and guarantees obscure the true extent of liabilities.
8. **Inter-generational Equity:** Borrowing for non-productive purposes shifts the debt burden to future generations.

Policy Recommendations

- The Finance Commission should adopt a **multi-dimensional framework** instead of a single fiscal ratio for assessing sustainability.
- Fiscal consolidation targets must be **State-specific**, considering economic capacity and development needs.
- **Block grants** should be provided with **Key Performance Indicators (KPIs)** for fiscal discipline and efficiency.

- States must strengthen their **own revenue mobilisation** and ensure borrowings are directed toward **productive capital expenditure**.
- Greater **fiscal transparency** and **coordination with the Centre** are essential for credible debt management.

Conclusion: Debt sustainability of States is a multi-dimensional and dynamic issue. The wide fiscal diversity among States makes a one-size-fits-all approach ineffective. A flexible, multi-criteria framework assessing solvency, repayment capacity, and productive use of debt is vital. Ensuring fiscal discipline, while allowing States autonomy to pursue growth-oriented borrowing, will promote both **macroeconomic stability** and **equitable development** across India.

Question: A one-size-fits-all approach to debt management may not be suitable for Indian States. In light of this statement, discuss the challenges of ensuring debt sustainability among Indian States and suggest suitable measures for improvement.

The AI Data Centres Infrastructure in India

Source: The post **"The AI Data Centres Infrastructure in India"** has been created, based on **"The AI Data Centres Infrastructure in India"** published in "The Hindu" on 31st October 2025.

UPSC Syllabus: GS Paper -3- Technology

Context: Over the past two decades, India's electricity demand has grown steadily at about 5 per cent annually. Traditionally, energy demand was managed through coal-based generation and grid planning, but the rapid expansion of **Artificial Intelligence (AI)**, **5G**, and **digital infrastructure** has changed the landscape. The growth of **AI data centres**, which support AI-driven computing, cloud services, and massive data storage, is expected to cause a steep rise in electricity consumption. Consequently, ensuring a **sustainable, low-carbon, and continuous power supply** for these data centres has emerged as a strategic priority for India's energy and technology policy.

Growing Energy Demand of AI Data Centres

1. AI data centres require far greater power than traditional enterprise servers because of their heavy computational workloads.
2. Training **Generative AI models** and **Large Language Models (LLMs)** such as ChatGPT demands enormous processing power using **Graphics Processing Units (GPUs)** and **Tensor Processing Units (TPUs)**.
3. A typical AI data centre can consume **5 to 20 times more power** than a traditional one, depending on workload and efficiency.
4. Globally, the **power requirement for AI data centres** is projected to grow from around **460 terawatt-hours (TWh) in 2024** to **1,000 TWh by 2030**.
5. China's AI and Large Model data centres alone are expected to consume **more than 400 billion kWh by 2025**.
6. India's current capacity of **0.4 gigawatts (GW)** is projected to exceed **10 GW by 2030**, driven by the expansion of **Digital India**, data localisation, and AI adoption.

Drivers of Data Centre Growth in India

1. The growing need for **cloud storage**, **AI training models**, and **data-intensive operations** has increased the number of data centres across cities like **Chennai, Bengaluru, Hyderabad, and Mumbai**.
2. Government programmes such as **Digital India**, **AI Mission**, and **data localisation mandates** have encouraged both domestic and foreign investment.
3. Several private and global tech firms are setting up large-scale AI data campuses to support India's digital and industrial transformation.
4. This expansion, while boosting the economy, is also exerting pressure on the national electricity grid and demanding new, sustainable energy sources.

Current and Emerging Power Sources

To meet the rising energy demand, data centres are using a **diverse energy mix**:

1. **Renewable energy sources** like **solar and wind** are central to decarbonisation targets.
2. **Hydropower** and **natural gas** are used to balance the intermittency of renewables.
3. **Hybrid systems**, integrating renewables with **battery storage** and **green hydrogen**, are emerging as dependable clean energy options.
4. However, due to the constant 24×7 power requirements of AI operations, there is a growing need for **baseload, non-intermittent, and low-carbon energy**, which renewables alone cannot fully guarantee.
5. Hence, attention is turning towards **Small Modular Reactors (SMRs)** as a long-term, sustainable energy solution for powering AI data hubs.

Role and Advantages of Small Modular Reactors (SMRs)

1. **Small Modular Reactors (SMRs)** are compact nuclear reactors that can be manufactured, transported, and installed in modular units.
2. They typically have a capacity of **50–300 megawatts (MW)** and use **slightly enriched uranium** as fuel.
3. They offer several **key advantages**:
    a. **Scalability and Modularity:** SMRs can be installed in clusters to match energy demand growth.
    b. **Passive Safety Features:** They use natural convection and advanced cooling systems, reducing the risk of accidents.
    c. **Lower Construction Time:** Modular design enables faster deployment compared to traditional nuclear plants.
    d. **Reduced Land and Water Use:** They require smaller sites, making them suitable for integration with industrial parks and data campuses.
    e. **Clean, Carbon-Free Energy:** SMRs provide constant, zero-carbon baseload power essential for uninterrupted AI computing.
4. India's nuclear research institutions like **BARC** and the **Department of Atomic Energy (DAE)** are working on 300 MW indigenous SMR designs.
5. Globally, SMR projects are being pursued by countries such as the U.S.A, Canada, and the U.K., with support from the **International Atomic Energy Agency (IAEA)** to establish safety and licensing frameworks.

Challenges and Regulatory Concerns

1. Despite their promise, several challenges slow down SMR adoption:
    a. **High upfront capital cost** and complex technology integration.
    b. **Lengthy regulatory clearances** and evolving nuclear safety standards.
    c. **Public concerns** regarding nuclear waste management and perceived safety risks.
    d. **Limited supply chain capacity** for reactor fabrication and skilled personnel.
    e. **Lack of clear financial and policy frameworks** for private participation in nuclear energy.
2. These issues must be addressed before SMRs can play a central role in powering AI data centres at scale.

Way Forward

1. **Develop a National SMR Strategy:** India should frame a clear roadmap for SMR development with defined milestones, safety standards, and financing models.
2. **Promote Public–Private Partnerships:** Collaboration between government agencies, private tech firms, and international players can accelerate SMR deployment for data centres.
3. **Strengthen Renewable–Nuclear Integration:** Combining SMRs with renewable sources can create a resilient, hybrid energy system to power future AI clusters.
4. **Regulatory Modernisation:** Simplified and transparent licensing procedures should be introduced to ensure faster, safer deployment.
5. **Public Awareness and Global Cooperation:** Building public trust and aligning with IAEA safety frameworks will be crucial for long-term acceptance and global competitiveness.

Conclusion: The rapid proliferation of AI-based data centres marks a new frontier in India's digital economy but also presents unprecedented energy challenges. Traditional power sources and standalone renewables will not be sufficient to meet the massive, uninterrupted, and low-carbon energy demand. **Small Modular Reactors**, with their scalability, safety, and clean energy potential, can serve as a reliable backbone for future AI-driven infrastructure. Adopting an integrated approach combining **SMRs, renewables, and green hydrogen** will help India ensure **energy security**, support **digital innovation**, and advance towards a **sustainable, net-zero future**.

Question: What will power AI data centres in the future? Discuss the energy demand, power sources, and the role of Small Modular Reactors (SMRs) in ensuring sustainable and reliable electricity supply.