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JULY 2025

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POLITY/ GOVERNANCE

PREVENTIVE DETENTION LAWS MUST BE USED SPARINGLY: SUPREME COURT

Source: *Supreme Court Judgment, June 2025; The Indian Express, June 2025*

UPSC Connection: Constitutional Rights, Internal Security; Relevant for UPSC Prelims and Mains (GS Paper 2 – Polity, Fundamental Rights; GS Paper 3 – Internal Security)

Overview:

The Supreme Court emphasized that **preventive detention**, an extraordinary state power to detain individuals without trial based on suspicion, must be used sparingly due to its impact on personal liberty. The ruling underscores the need for strict adherence to constitutional safeguards under Article 22 to prevent misuse.

Definition/Detailing:

- **Preventive Detention**: Detention of an individual without trial or conviction, based on suspicion of potential harm to public order or national security.
- It differs from punitive detention, which follows a trial and conviction for a committed offense.
- **Constitutional Provisions**:

Article 22: Protects against arbitrary arrest and detention but excludes preventive detention cases from certain safeguards.

Article 22(3)(b): Exempts preventive detention from standard protections under Article 22.

Article 22(4)–(7): Outline procedures, including advisory board reviews and communication of detention grounds.

Comparison:

- **Objective**: Preventive detention aims to prevent future harm, while punitive detention punishes past crimes.
- **Nature**: Preventive detention lacks trial, while punitive detention follows judicial conviction.
- **Duration**: Preventive detention is temporary (up to three months without advisory board approval), while punitive detention varies based on sentencing guidelines.
- **Bail**: Preventive detention is typically non-bailable, unlike punitive detention, where bail is often available.
- **India vs. Other Democracies**: The U.S. and UK have stricter oversight for preventive measures (e.g., habeas corpus), while India's laws allow broader state discretion with limited judicial review.

Key Features/Details:

- **Constitutional Safeguards**:
- **Article 22(4)**: Detention beyond three months requires advisory board approval, comprising High Court judge-qualified members.
- **Article 22(5)**: Authorities must communicate grounds of detention promptly, allowing detainees to challenge the order.
- **Article 22(6)**: Grounds can be withheld if disclosure harms public interest.
- **Operational Procedure**:

Criteria	Preventive Detention	Punitive Detention
Objective	To proactively prevent an individual from engaging in activities deemed harmful to society or national security.	To impose punishment on an individual convicted of a criminal offense.
Nature of Offense	Involves detention without a trial or conviction, based on suspicion of potential threat to public order or security.	Imposed only after a formal trial and conviction in a court of law.
Duration	Fixed duration as per relevant laws, typically temporary, with extensions subject to periodic review by an Advisory Board (as mandated under Article 22 of the Indian Constitution).	Determined by sentencing guidelines specific to the crime, ranging from months to life imprisonment or, in rare cases, the death penalty.
Right to Bail	Generally non-bailable, meaning detained individuals have no automatic right to seek bail during the detention period.	Individuals can seek bail during trial or appeals, depending on the offense's nature and judicial discretion.
Judicial Review	Limited scope for judicial review, with challenges allowed only on procedural grounds or violation of constitutional safeguards (e.g., under Article 22).	Individuals have the right to appeal convictions and sentences through higher courts.
Examples	Governed by central laws like the **National Security Act (NSA), 1980**, **Unlawful Activities (Prevention) Act (UAPA), 1967**, and state laws like the **Telangana Preventive Detention Act** or **Bihar Control of Crimes Act**.	

- District Magistrates issue detention orders to maintain public order.
- Detainees can challenge orders in court but lack representation before advisory boards.
- **Judicial Review**:
- Limited to procedural compliance (e.g., advisory board's diligence) and absence of mala fide intent by the state.
- The state's subjective satisfaction is prioritized over fundamental rights scrutiny.
- **Legislative Framework**:
- Central laws: **National Security Act (NSA)**, **Unlawful Activities (Prevention) Act (UAPA)**.
- State laws: **Telangana Preventive Detention Act**, **Bihar Control of Crimes Act**.

Additional Information:

- **Economic Context**: Preventive detention can disrupt livelihoods, impacting economic productivity in affected regions.
- **Social Context**: Overuse risks alienating communities, especially in insurgency-prone areas, undermining trust in governance.
- **Policy Context**: Aligns with India's internal security framework but requires stricter oversight to prevent misuse, as seen in cases like UAPA.
- **Global Perspective**: India's preventive detention laws are broader than those in liberal democracies, raising concerns in international human rights reports (e.g., Amnesty International).

Challenges and Implications:

- **Liberty vs. Security**: Balancing individual rights with national security remains

contentious, especially in terror-prone regions.

- **Judicial Oversight**: Limited judicial review risks arbitrary detentions, necessitating stronger safeguards.
- **Misuse Potential**: Vague grounds for detention (e.g., public order) can lead to political targeting.

Way Forward:

- Strengthen judicial oversight to ensure compliance with Article 22 safeguards.
- Limit detention periods and mandate transparent grounds for detention.
- Enhance advisory board independence to prevent state overreach.

NO CONTEMPT IF PARLIAMENT AND LEGISLATURES MAKE LAWS: SC

Source: *Supreme Court Judgment, June 2025; The Hindu, June 2025*

UPSC Connection: Separation of Powers, Role of Judiciary; Relevant for UPSC Prelims and Mains (GS Paper 2 – Polity, Judiciary)

Overview:

In the **Nandini Sundar vs. State of Chhattisgarh** case, the Supreme Court dismissed a contempt petition, ruling that Chhattisgarh's **Auxiliary Armed Police Forces Act, 2011**, did not violate its 2011 order banning Special Police Officers (SPOs) in anti-Maoist operations.

Definition/Detailing:

- The 2011 SC order prohibited SPOs in counter-insurgency activities, citing violations of Articles 14 and 21.
- Chhattisgarh's 2011 Act created an auxiliary force to assist security operations, which petitioners claimed breached the SC order.

Comparison:

- **2011 Order vs. 2011 Act**: The SC order banned untrained SPOs, while the Act regulates trained auxiliary forces under supervision, aligning with legal frameworks.
- **Judiciary vs. Legislature**: The SC's ruling upholds legislative autonomy, reinforcing separation of powers.

Key Features/Details:

- **2011 SC Order**:
- Banned SPOs in anti-Maoist operations due to inadequate training and rights violations.
- Prohibited groups like Salwa Judum and Koya Commandos.
- **Chhattisgarh Auxiliary Armed Police Forces Act, 2011**:
- Creates an auxiliary force to assist security operations, with mandatory six-month training.
- Ensures SPOs are not deployed in frontline roles.
- **SC Ruling**:
- Valid legislation cannot be treated as contempt, upholding legislative authority.

Additional Information:

- **Economic Context**: Counter-insurgency operations require significant resources, impacting state budgets.
- **Social Context**: The ruling addresses human rights concerns in tribal areas affected by Maoism.
- **Policy Context**: Reinforces the judiciary's role in checking executive actions while respecting legislative powers.

- **Geopolitical Context**: Maoist insurgency affects India's internal security, requiring balanced governance.

Way Forward:

- Strengthen training and oversight for auxiliary forces.
- Address tribal grievances to reduce Maoist influence.
- Ensure judicial-legislative harmony through clear legal frameworks.

WHY IS THE ECI DE-LISTING POLITICAL PARTIES?

Source: *Election Commission of India, June 2025; The Indian Express, June 2025*

UPSC Connection: Constitutional Bodies, Election Commission; Relevant for UPSC Prelims and Mains (GS Paper 2 – Polity, Governance)

Overview:

The Election Commission of India (ECI) is de-listing 345 **Registered Unrecognised Political Parties (RUPPs)** that have been inactive or exist only on paper, aiming to clean up the electoral system and curb misuse of tax exemptions.

Definition/Detailing:

- **RUPPs** are political parties registered under Section 29A of the Representation of the People Act, 1951, but not recognized as state or national parties.
- The ECI's de-listing targets "letter pad parties" that fail to contest elections or update office-bearer details.

Comparison:

- **RUPPs vs. Recognized Parties**: RUPPs enjoy tax exemptions and common symbols but lack the electoral influence of recognized parties.
- **India vs. Other Democracies**: The U.S. and UK have stricter deregistration norms for inactive parties, unlike India's limited ECI powers.

Key Features/Details:

- **De-Listing Process**:
- Targets 345 RUPPs inactive for six years or with untraceable offices.
- Show-cause notices issued before de-listing.
- **RUPP Benefits**:
- Tax exemptions under Section 13A of the Income Tax Act, 1961.
- Common election symbols and 20 star campaigners.
- **Issues**:
- Lack of ECI power to de-register parties under the RP Act, except in cases of fraud or disloyalty to the Constitution.
- Inactive RUPPs facilitate tax evasion and money laundering.
- **Recommendations:**
- Law Commission (255th Report, 2015): De-register parties inactive for 10 years.
- ECI (2016): Amend RP Act for de-registration powers.

Way Forward:

- Amend RP Act to empower ECI for de-registration.
- Enforce inner-party democracy through mandatory elections.
- Strengthen donor transparency to curb financial misuse.

NEW PROTECTIONS FOR LADAKH

Source: *Ministry of Home Affairs, June 2025; The Hindu, June 2025*

UPSC Connection: Constitution, Polity, and Governance; Relevant for UPSC Prelims and Mains (GS Paper 2 – Polity, Governance)

Overview:

The **Union Territory of Ladakh Reservation (Amendment) Regulation 2025** introduces domicile-based job reservations, language recognition, and women's representation in Ladakh's governance, addressing civil society demands post-2019 bifurcation from Jammu & Kashmir.

Definition/Detailing:

- The regulations amend the Jammu and Kashmir Reservation Act, 2004, to provide region-specific protections for jobs, education, and cultural identity in Ladakh.
- Key demands like statehood and Sixth Schedule inclusion remain unmet, highlighting governance gaps.

Comparison:

- **Ladakh vs. Northeastern States**: The Sixth Schedule provides tribal areas in Assam, Meghalaya, Tripura, and Mizoram with legislative autonomy, unlike Ladakh's administrative LAHDCs.
- **Pre- vs. Post-2019**: Earlier, Ladakh lacked domicile criteria and language recognition, which the 2025 regulations address.

Key Features/Details:

- **Ladakh Civil Services Decentralisation and Recruitment (Amendment) Regulation 2025**:
- Introduces domicile criteria (15 years residency or 7 years of education in Ladakh) for government jobs.
- **Ladakh Civil Services Domicile Certificate Rules 2025**:
- Defines procedures for obtaining domicile certificates, with tehsildars as issuing authorities.
- **Union Territory of Ladakh Reservation (Amendment) Regulation 2025**:
- Caps reservations at 85% for SC, ST, OBC, and backward groups (excluding 10% EWS).
- Extends 85% reservation to professional institutions (e.g., engineering colleges).
- **Ladakh Official Languages Regulation 2025**:
- Recognizes English, Hindi, Urdu, Bhoti, and Purgi as official languages, with support for Shina, Brokskat, Balti, and Ladakhi.
- **Ladakh Autonomous Hill Development Councils (Amendment) Regulation 2025**:
- Reserves one-third of LAHDC seats for women.
- **Limitations:**
- Lack of constitutional guarantees (under Article 240, not Sixth Schedule).
- No land ownership safeguards or legislative autonomy.
- Short domicile period (15 years) and symbolic language recognition.

Way Forward:

- Grant Sixth Schedule status for constitutional safeguards.
- Introduce land ownership restrictions to protect ecology and demography.
- Establish a legislative assembly for representative governance.

ASSAM TO FOLLOW 1950 LAW TO EXPEL ILLEGAL IMMIGRANTS WITHOUT TRIAL

Source: *Ministry of Home Affairs, June 2025; The Indian Express, June 2025*

UPSC Connection: Internal Security, Citizenship; Relevant for UPSC Prelims and Mains (GS Paper 2 – Polity, Governance; GS Paper 3 – Internal Security)

Overview:

Assam's Chief Minister announced plans to use the **Immigrants (Expulsion from Assam) Act, 1950**, to expel illegal immigrants without judicial trials, addressing long-standing concerns about illegal migration from Bangladesh. The Supreme Court (2024) upheld the Act's validity, enabling faster deportation processes alongside existing laws like the **Citizenship Act** and **Foreigners Act**.

Definition/Detailing:

- The **1950 Act** empowers the Central Government to expel individuals or groups whose presence harms public interest or affects Scheduled Tribes' rights, allowing local officers (e.g., district commissioners) to issue expulsion orders without court trials.
- Enacted post-Partition to address mass migration from East Bengal (now Bangladesh), it complements modern laws like the **Foreigners Act, 1946**, and **Section 6A of the Citizenship Act**.

Comparison:

- **1950 Act vs. Modern Laws**: The 1950 Act allows direct expulsion without trials, unlike the **Foreigners (Tribunals) Order, 1964**, which mandates tribunal hearings.
- **Assam vs. Other States**: Assam's unique migration challenges, due to its porous border with Bangladesh, justify the Act's tailored application, unlike other states with standardized immigration laws.

Key Features/Details:

- **Immigrants (Expulsion from Assam) Act, 1950**:
- Enacted to manage post-Partition migration from East Bengal driven by communal violence and open borders.
- Authorizes the Central Government or delegated officers (e.g., district commissioners) to expel illegal immigrants.
- Protects Scheduled Tribes' rights and public interest.
- **Legal Validity**:
- Upheld by the Supreme Court in 2024, alongside **Section 6A of the Citizenship Act** (Assam Accord, 1985), which identifies post-1971 migrants as foreigners.
- Operates with the **Foreigners Act, 1946**, and other laws like the **Passport Act, 1967**.
- **Context**:
- The **Assam Movement (1979–1985)**, led by the All Assam Students' Union (AASU), highlighted illegal migration concerns, culminating in the **Assam Accord (1985)**.
- The **National Register of Citizens (NRC)** process faced delays, prompting renewed use of the 1950 Act.

Challenges and Implications:

- **Human Rights**: Direct expulsions without trials risk violating due process, drawing criticism from human rights bodies.
- **Implementation**: Identifying illegal migrants without clear documentation is challenging, especially post-NRC.
- **Regional Stability**: Aggressive deportation could strain India-Bangladesh ties.

Way Forward:

- Establish transparent criteria for identifying illegal migrants.
- Strengthen border management through fencing and surveillance.
- Engage diplomatically with Bangladesh to address migration root causes.

SUPREME COURT'S OBSERVATION IN NANDINI SUNDAR VS. STATE OF CHHATTISGARH CASE, 2025

Source: *Supreme Court Judgment, June 2025; The Hindu, June 2025*

UPSC Connection: Separation of Powers, Role of Judiciary; Relevant for UPSC Prelims and Mains (GS Paper 2 – Polity, Judiciary)

Overview:

The Supreme Court, in the **Nandini Sundar vs. State of Chhattisgarh** case (2025), dismissed a contempt petition, affirming that the Chhattisgarh government complied with its 2011 ruling banning untrained Special Police Officers (SPOs) in anti-Maoist operations. The Court emphasized that valid legislation by Parliament or state legislatures cannot be deemed contempt unless it violates constitutional provisions, reinforcing the doctrine of separation of powers.

Definition/Detailing:

- The **2011 SC ruling** prohibited the use of untrained SPOs (e.g., Salwa Judum, Koya Commandos) in counter-insurgency operations, citing violations of Articles 14 (equality) and 21 (right to life).
- The **Chhattisgarh Auxiliary Armed Police Forces Act, 2011** created a regulated auxiliary force with mandatory training, addressing the Court's concerns.
- **Separation of Powers**: A constitutional principle dividing functions among the legislature (law-making), executive (implementation), and judiciary (interpretation), ensuring checks and balances.

Comparison:

- **2011 Ruling vs. 2011 Act**: The 2011 SC order banned untrained SPOs to protect constitutional rights, while the 2011 Act formalized a trained auxiliary force, aligning with legal frameworks.
- **Judiciary vs. Legislature**: The ruling upholds legislative autonomy, as seen in the **Indian Aluminium Co. vs. State of Kerala (1996)** case, which emphasized maintaining a balance among the three sovereign functionaries (legislature, executive, judiciary).

Key Features/Details:

- **2011 SC Order**:
- Prohibited SPOs in anti-Maoist operations due to inadequate training and human rights violations.
- Declared groups like Salwa Judum unconstitutional.
- **Chhattisgarh's 2011 Act**:
- Established a trained auxiliary force to assist security operations, ensuring compliance with the SC's directive.
- Requires six months of mandatory training for personnel.
- **2025 SC Ruling**:
- Rejected the contempt petition, affirming that valid legislation cannot be held as contempt

unless it is ultra vires (beyond legislative competence) or violates the Constitution.

- Emphasized the legislature's power to enact laws to address judicial rulings or validate struck-down laws.
- **Separation of Powers**:
- The ruling reinforces that the judiciary cannot invalidate laws on contempt grounds unless they breach constitutional limits.
- Cites the **Indian Aluminium Co. case (1996)**, highlighting the need for a delicate balance among the legislature, executive, and judiciary.

Challenges and Implications:

- **Human Rights**: Ensuring auxiliary forces adhere to constitutional protections (Articles 14, 21) is critical to prevent abuses.
- **Maoist Insurgency**: The ruling supports structured security measures but does not address root causes like tribal alienation and underdevelopment.
- **Judicial-Legislative Balance**: The decision underscores the need for harmony between branches of government to uphold constitutional democracy.

Way Forward:

- Strengthen training and oversight for auxiliary forces to ensure compliance with human rights standards.
- Address tribal grievances through development schemes like PM Awas Yojana and MGNREGA to reduce Maoist influence.
- Promote dialogue between judiciary and legislature to clarify legal frameworks for counter-insurgency operations.

GOVERNMENT EASES PROCUREMENT NORMS FOR RESEARCH LABS

Source: *Ministry of Science and Technology, June 2025; The Indian Express, June 2025*

UPSC Connection: Science and Technology, Governance; Relevant for UPSC Prelims and Mains (GS Paper 2 – Governance; GS Paper 3 – Science and Technology)

Overview:

The government relaxed procurement rules for select research institutions, allowing them to bypass the **Government e-Marketplace (GeM)** portal for high-quality scientific equipment. This addresses scientists' concerns about substandard equipment, enhancing research autonomy and efficiency.

Definition/Detailing:

- **GeM Portal**: An online marketplace by the Ministry of Commerce for government procurement, prioritizing made-in-India products.
- **New Rules**: Allow heads of select institutions to procure specialized equipment globally, doubling no-quotation purchase limits to ₹2 lakh and approving global tenders up to ₹200 crore.

Comparison:

- **Old vs. New Rules**: Earlier rules mandated GeM for all purchases, causing delays for specialized equipment. New rules grant flexibility to select institutions.
- **India vs. Global Standards**: Aligns with U.S. and EU practices, where research labs have procurement autonomy for cutting-edge technology.

Key Features/Details:

- **Bypassing GeM**:

Allows procurement of scientific equipment outside GeM for quality assurance.

- **Global Tender Autonomy**:

  Institution heads can approve global tenders up to ₹200 crore, bypassing departmental secretaries.

- **Increased Purchase Limits**:

  No-quotation ceiling doubled from ₹1 lakh to ₹2 lakh for scientific departments.

- **Eligible Institutions**:

  Includes organizations under the Ministry of Science and Technology, CSIR, Departments of Atomic Energy and Space, ICMR, ICAR, and postgraduate research institutions.

- **Significance:**

  Enhances research autonomy, speeds up procurement, and ensures quality equipment.

Challenges and Implications:

- **Misuse Risk**: Relaxed rules may lead to procurement irregularities without oversight.
- **Equity**: Limited to select institutions, potentially marginalizing smaller labs.
- **Local Industry**: Bypassing GeM may affect made-in-India equipment manufacturers.

Way Forward:

- Implement strict audit mechanisms to prevent misuse.
- Extend benefits to smaller research institutions.
- Balance global sourcing with support for local manufacturers.

UMEED PORTAL FOR WAQF PROPERTY MANAGEMENT

Source: *Ministry of Minority Affairs, June 2025; The Hindu, June 2025*

UPSC Connection: Digital Governance, Minority Welfare; Relevant for UPSC Prelims and Mains (GS Paper 2 – Governance, Social Justice)

Overview:

The **UMEED Portal**, launched by the Ministry of Minority Affairs, is a centralized digital platform for managing Waqf properties through geo-tagging, registration, and transparent governance. It aligns with the **Waqf (Amendment) Act, 2025**, to enhance accountability and efficiency in Waqf asset administration.

Definition/Detailing:

- **Waqf**: Properties dedicated under Islamic law for charitable or religious purposes, managed by state Waqf boards.
- **UMEED Portal**: Stands for **Unified Waqf Management, Empowerment, Efficiency and Development Act, 1995**, amended in 2025. It provides a digital inventory for real-time monitoring, grievance redressal, and public access to Waqf records.

Comparison:

- **UMEED vs. Traditional Waqf Management**: Manual systems lacked transparency and were prone to encroachments, while UMEED ensures digital tracking and accountability.
- **India vs. Other Islamic Countries**: India's digital Waqf management is advanced compared to manual systems in countries like Pakistan, aligning with global e-governance trends.

Key Features/Details:

- **Digital Inventory**:

  Geo-tags Waqf properties, assigning a 17-digit unique identification number.

  Integrates with GIS mapping and e-governance tools.

- **Mandatory Registration**:

  All Waqf properties must be registered within six months from June 2025.

  Unregistered properties are classified as disputed and referred to Waqf tribunals.

- **Verification Process**:

  Requires official documents for registration to prevent illegal claims.

  Properties on government land need state government verification, as land is a state subject.

- **Grievance Redressal**:

  Online system for public complaints and feedback.

- **Transparency**:

  Tracks leasing and usage, ensuring assets benefit poor Muslims as intended.

Challenges and Implications:

- **Implementation**: Ensuring timely registration and verification across states is challenging.
- **Encroachments**: Disputes over Waqf properties require robust tribunal mechanisms.
- **State Coordination**: Land being a state subject complicates verification processes.

Way Forward:

- Strengthen Waqf tribunals for faster dispute resolution.
- Promote awareness among mutawallis for timely registration.
- Enhance state-central coordination for seamless implementation.

REFRAMING RELIGIOUS FREEDOM: USCIRF ANNUAL REPORT

Source: *USCIRF Annual Report, June 2025; The Indian Express, June 2025*

UPSC Connection: International Reports, Fundamental Rights; Relevant for UPSC Prelims and Mains (GS Paper 2 – International Relations, Fundamental Rights)

Overview:

The **United States Commission on International Religious Freedom (USCIRF)** 2025 report designated India as a **Country of Particular Concern (CPC)**, citing alleged violations of religious freedom. India rejected the report, criticizing its Eurocentric bias and emphasizing its constitutional commitment to religious freedom under Articles 25–30.

Definition/Detailing:

- **USCIRF**: A U.S. federal body created under the **International Religious Freedom Act, 1998**, to monitor and report on global religious freedom violations.
- **CPC Status**: Countries with severe, systematic violations of religious freedom, potentially triggering U.S. sanctions or diplomatic actions.
- **India's Constitutional Framework**: Articles 25–28 guarantee freedom of religion, with reasonable restrictions for public order, health, and morality. Articles 29–30 provide minorities with rights to manage cultural and educational institutions.

Comparison:

- **India vs. Other CPCs**: Unlike countries like Pakistan or China, India's diverse religious

landscape and constitutional protections ensure coexistence, though incidents of communal tension occur.

- **USCIRF vs. India's Framework**: USCIRF's Eurocentric lens focuses on individual rights, while India's **Integral Humanism** emphasizes collective harmony and pluralistic ethos.

Key Features/Details:

- **USCIRF's Critique**:
- Designated India as a CPC, alleging restrictions on religious practices and minority rights.
- Relies on selective data and biased scholars, ignoring India's pluralistic context.
- **India's Response**:
- Rejected the report as an "entity of concern" with a Eurocentric bias.
- Highlighted constitutional protections (Articles 25–30) and India's history of religious harmony.
- **Constitutional Provisions**:
- **Article 25**: Freedom of conscience and right to practice, profess, and propagate religion.
- **Article 26–28**: Rights to manage religious affairs and institutions.
- **Article 29–30**: Minority rights to preserve culture and establish educational institutions.
- **Integral Humanism**:
- A philosophy by Deendayal Upadhyaya and Jacques Maritain, emphasizing holistic well-being beyond religious divisions, rooted in India's pluralistic ethos.

Challenges and Implications:

- **Global Perception**: CPC designation may affect India's image as a pluralistic democracy.
- **Policy Bias**: USCIRF's Eurocentric framework overlooks India's cultural context, necessitating a global dialogue on religious freedom metrics.
- **Domestic Harmony**: Addressing communal incidents is critical to counter external criticisms.

Way Forward:

- Engage with global bodies to promote India's pluralistic model.
- Strengthen interfaith dialogue through initiatives like the National Integration Council.
- Enhance transparency in handling communal issues to counter biased reports.

FASTAG ANNUAL PASS SCHEME

Source: *Ministry of Road Transport and Highways, June 2025; The Indian Express, June 2025*

UPSC Connection: Governance, Infrastructure; Relevant for UPSC Prelims and Mains (GS Paper 2 – Governance; GS Paper 3 – Infrastructure)

Overview:

The **FASTag Annual Pass Scheme**, announced by the Ministry of Road Transport and Highways (MoRTH), introduces a ₹3,000 annual pass for non-commercial private vehicles, allowing free passage at National Highway (NH) and National Expressway (NE) toll plazas for one year or 200 trips. It leverages RFID technology for efficient toll management.

Definition/Detailing:

- **FASTag**: An electronic toll collection system using **Radio Frequency Identification (RFID)** technology, where a tag on the vehicle's windshield enables automatic toll deductions.

- The annual pass reduces per-trip costs (average ₹15 per toll) and addresses commuter concerns about toll plaza delays.

Comparison:

- **FASTag Annual Pass vs. Regular FASTag**: The annual pass offers unlimited toll-free trips (up to 200) for a fixed fee, unlike regular FASTag's per-trip deductions.
- **India vs. Global Systems**: Similar to Singapore's ERP system, but India's FASTag is more widespread, covering 99% of NH toll plazas.

Key Features/Details:

- **Pass Details**:

  Costs ₹3,000, valid for one year or 200 trips, whichever comes first.

  Non-transferable, linked to the vehicle's FASTag.

- **Scope**:

  Applies to non-commercial vehicles (cars, jeeps, vans) at NH and NE toll plazas.

  Regular FASTag applies at state-managed plazas.

- **Benefits**:

  Reduces toll plaza congestion and commuter costs.

  Enhances transparency through digital payments.

- **RFID Technology**:

  Uses tags and readers for wireless toll collection, minimizing human intervention.

Challenges and Implications:

- **Adoption**: Limited awareness among rural commuters may hinder uptake.
- **Infrastructure**: Requires consistent RFID reader maintenance at toll plazas.
- **Equity**: Excludes commercial vehicles, limiting broader impact.

Way Forward:

- Extend the scheme to commercial vehicles for wider benefits.
- Promote awareness through campaigns and digital platforms.
- Upgrade toll plaza infrastructure for seamless operations.

DIGIPIN: INDIA'S NEW DIGITAL ADDRESS SYSTEM

Source: *Department of Posts, June 2025; The Indian Express, June 2025*

UPSC Connection: Digital Governance, Technology; Relevant for UPSC Prelims and Mains (GS Paper 2 – Governance; GS Paper 3 – Technology)

Overview:

The **DIGIPIN (Digital Postal Index Number)**, launched by the Department of Posts, is a 10-digit alphanumeric code system for precise location identification across India. Developed with IIT Hyderabad and ISRO's National Remote Sensing Centre, it enhances service delivery and aligns with the **National Geospatial Policy, 2022**.

Definition/Detailing:

- **DIGIPIN**: A geospatial referencing system assigning a unique code to a 4x4 meter grid based on latitude and longitude, unlike the six-digit PIN code covering larger areas.
- It supports **Address-as-a-Service (AaaS)**, enabling integration with government and private services for accurate last-mile delivery and emergency response.

Comparison:

- **DIGIPIN vs. PIN Code**: DIGIPIN offers precise coordinates (4x4 meter grid) compared to the broader geographic coverage of PIN codes.
- **India vs. Global Systems**: DIGIPIN resembles global systems like **What3Words** (UK) but is tailored for India's diverse terrain and digital governance needs.

Key Features/Details:

- **Precision**:

  Maps locations to a 4x4 meter grid using exact coordinates.

  Covers urban, rural, remote, and maritime areas.

- **Open-Source and Privacy-Centric**:

  Encodes only location data, ensuring no personal information is stored.

- **Applications**:

  Enhances e-commerce last-mile delivery, emergency services (police, ambulance), and governance (e.g., DBT schemes).

- **Collaboration**:

  Developed with IIT Hyderabad and ISRO, aligning with the **National Geospatial Policy, 2022**.

- **Coexistence**:

  Complements the existing PIN code system, enhancing functionality for high-precision use cases.

Challenges and Implications:

- **Adoption**: Requires widespread awareness and digital literacy for effective use.
- **Infrastructure**: Needs robust internet and smartphone penetration in rural areas.
- **Integration**: Coordinating with state agencies and private players is critical for scalability.

Way Forward:

- Launch awareness campaigns to promote DIGIPIN adoption.
- Strengthen rural digital infrastructure for seamless implementation.
- Integrate DIGIPIN with UPI and Aadhaar for holistic e-governance.

QR CODES ON ROADS BUILT UNDER PM GRAM SADAK YOJANA

Source: *Ministry of Rural Development, June 2025; The Hindu, June 2025*

UPSC Connection: Digital Governance, Rural Development; Relevant for UPSC Prelims and Mains (GS Paper 2 – Governance; GS Paper 3 – Infrastructure)

Overview:

The Ministry of Rural Development (MoRD) mandated installing **QR codes** on maintenance display boards of roads built under the **Pradhan Mantri Gram Sadak Yojana (PMGSY)**. This initiative enables public feedback on road quality, integrated with the **e-MARG** system, to enhance rural infrastructure maintenance.

Definition/Detailing:

- **PMGSY**: A flagship scheme launched in 2000 to provide all-weather road connectivity to rural habitations.
- **QR Code Initiative**: Allows citizens to scan codes for road details and submit feedback on maintenance issues, analyzed using AI/ML tools for performance evaluation.

Comparison:

- **QR Code vs. Traditional Feedback**: QR codes enable real-time, digital feedback, unlike manual complaint systems prone to delays.

- **India vs. Other Nations**: Similar to Singapore's digital urban feedback systems, but India's initiative targets rural connectivity challenges.

Key Features/Details:

- **QR Code Initiative**:

  Installed on PMGSY road maintenance boards for public feedback on quality and damage.

  Integrated with the **e-MARG** system for monitoring.

- **AI/ML Analysis**:

  Citizen-submitted photos are analyzed to assign **Performance Evaluation (PE)** marks to contractors.

- **PMGSY Overview:**

  Phases: Phase I (2000), Phase II (2013), RCPLWEA (2016), Phase III (2019), Phase IV (2024).

  Phase IV: Targets 25,000 unconnected habitations (500+ in plains, 250+ in hills/NE, 100+ in LWE areas).

  Funding: 60:40 (Centre:State) for most states; fully funded for NE and Himalayan states.

  Implementing Agency: National Rural Infrastructure Development Agency (NRIDA).

- **Maintenance**:

  Contractors maintain roads for five years post-construction, monitored via e-MARG.

Challenges and Implications:

- **Digital Divide**: Limited smartphone access in rural areas may restrict feedback.
- **Contractor Accountability**: Ensuring action on poor PE marks is critical.
- **Scalability**: Nationwide implementation requires robust state coordination.

Way Forward:

- Promote digital literacy to boost citizen participation.
- Strengthen contractor accountability through stricter penalties.
- Expand QR code integration to other rural schemes.

ECONOMIC DEVELOPMENT

INDIA BECOMES THE WORLD'S FOURTH LARGEST ECONOMY

Source: *NITI Aayog Statement, June 2025; The Economic Times, June 2025*

UPSC Connection: Economy (Growth and Development); Relevant for UPSC Prelims and Mains (GS Paper 3 – Economic Development)

Overview:

India has surpassed Japan to become the world's fourth-largest economy in nominal GDP terms in 2025, with a GDP of $4.18 trillion, as per IMF estimates. This milestone reflects India's rapid economic growth but also highlights the limitations of nominal GDP as a metric compared to Purchasing Power Parity (PPP).

Definition/Detailing:

- **Nominal GDP**: The total value of goods and services produced in a country at current market prices in USD, unadjusted for inflation or cost-of-living differences.
- **Purchasing Power Parity (PPP)**: A metric that adjusts GDP for differences in price levels and cost of living, reflecting the real purchasing power of a country's currency.
- India's nominal GDP ($4.18 trillion) places it behind the U.S., China, and Germany, while its PPP-based GDP ($17.65 trillion) ranks it third globally since 2009.

Comparison:

- **Nominal GDP vs. PPP**:
- Nominal GDP is distorted by exchange rate fluctuations (e.g., a weaker INR reduces India's GDP in USD terms).
- PPP accounts for local purchasing power, showing India's economy as larger and more reflective of real economic activity.
- **India vs. Japan**: India's nominal GDP marginally overtook Japan's in 2025, but Japan's per capita income ($39,000) far exceeds India's ($2,879).
- **India vs. UK**: India ranks 4th in nominal GDP, while the UK is 6th, but the UK's per capita income ($54,949) highlights disparities in living standards.

Key Features/Details:

- **India's Economic Rise**:
- IMF data projects India's nominal GDP at $4.18 trillion in 2025, with potential to become the third-largest economy by 2028.
- In PPP terms, India overtook Japan in 2009 and ranks third globally.
- **Limitations of Nominal GDP**:
- **Exchange Rate Distortions**: Currency fluctuations can misrepresent economic size (e.g., INR depreciation reduces nominal GDP).
- **Cost of Living**: Nominal GDP ignores lower costs in India, where $1 buys more than in Japan or the U.S.
- **Per Capita Disparities**: India's per capita income ($2,879) lags far behind developed nations, reflecting uneven development.
- **PPP Advantages**:
- Stable against exchange rate changes, offering a fairer comparison.

- Reflects real purchasing power and economic well-being.

Challenges:

- India's per capita GDP (PPP) ranks 127th globally, and nominal per capita GDP ranks 144th, indicating low individual income levels.
- Beyond GDP, indicators like HDI, Multidimensional Poverty Index, and Gender Inequality Index reveal gaps in social progress.

Beyond GDP Metrics:

- **Human Development Index (HDI)**: India's HDI score (0.633) lags behind China (0.768) and developed nations, emphasizing the need for investment in education and health.
- **Multidimensional Poverty Index (MPI)**: Despite poverty reduction (5.3% extreme poverty), 15% of India's population remains multidimensionally poor, requiring targeted policies.
- **Gender Inequality Index**: Gender disparities in income and opportunities must be addressed to maximize economic gains.

Way Forward:

- Enhance education and skill development to boost per capita income.
- Strengthen social welfare schemes to address multidimensional poverty.
- Leverage global supply chain shifts to attract manufacturing investments.

INDIA'S GOLDILOCKS MOMENT

Source: *Ministry of Finance, Monthly Economic Review, June 2025; The Hindu, June 2025*

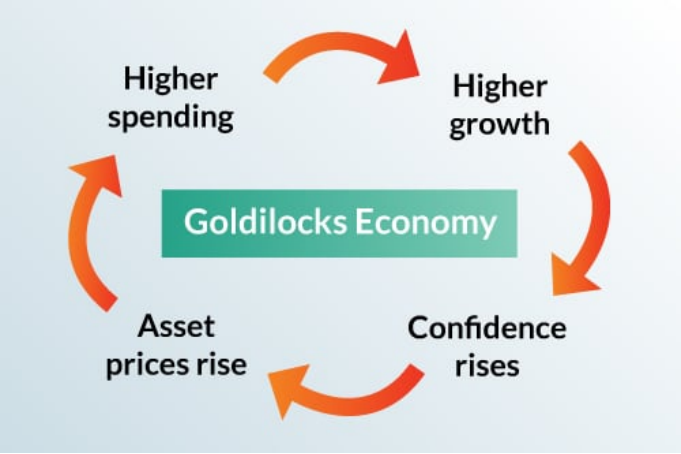
UPSC Connection: Economy (Growth and Development); Relevant for UPSC Prelims and Mains (GS Paper 3 – Economic Development)

Overview:

India's economy is experiencing a "Goldilocks Moment," characterized by balanced economic growth, controlled inflation, and supportive monetary policies, as highlighted in the Ministry of Finance's June 2025 Monthly Economic Review. This optimal economic state avoids extremes of high inflation or sluggish growth, creating an environment conducive to investment, consumption, and industrial activity.

Definition/Detailing:

- A **Goldilocks economy** refers to an ideal economic scenario where growth is steady, inflation is low, and monetary policies are market-friendly, avoiding overheating (high inflation) or stagnation (low GDP growth).
- For India, this moment reflects a delicate balance where the economy grows robustly (6.5% GDP growth in 2024-25), inflation is at a 75-month low (2.82% in May 2025), and monetary policies (e.g., repo rate cuts) foster borrowing and investment.



Comparison:

- Compared to other major economies, India's 6.5% GDP growth in 2024-25 positions it as the fastest-growing major economy, outpacing China (4.5–5%), the U.S. (2–2.5%), and the Eurozone (1–1.5%).

- Unlike economies facing high inflation (e.g., the U.S. with 3–4% CPI inflation in 2025) or recession risks (e.g., Germany), India's low inflation and steady growth create a unique economic sweet spot.

Key Features/Details:

- **Accommodative Monetary Policy**:
- The Reserve Bank of India (RBI) reduced the **repo rate** by 100 basis points to 5.5% over three meetings, lowering borrowing costs and encouraging investment and consumption.
- A **100 basis points cut in the Cash Reserve Ratio (CRR)** to 3% has injected ₹2.5 lakh crore into the banking system, enhancing liquidity for lending.
- **Controlled Inflation**:
- Retail inflation (CPI-based) dropped to **2.82% in May 2025**, well below the RBI's 4% target, enhancing consumer purchasing power and reducing input costs for industries.
- **Robust Economic Growth**:
- India's GDP grew by **6.5% in 2024-25**, driven by strong economic indicators such as increased GST collections, E-way bill generation, air passenger traffic, and fuel consumption.
- **Challenges:**
- Slowdowns in construction inputs, real estate, and automobile sales signal potential sectoral weaknesses.
- Rising **household debt-to-GDP ratio** (42%) and declining **household savings** (18% of GDP in FY24) threaten medium-term consumption.
- Geopolitical tensions (e.g., brief Israel-Iran conflict) spiked crude oil prices, impacting India's current account and fiscal deficits. Though eased post-ceasefire, risks from shipping insurance and supply chain disruptions persist.
- Global trade frictions and policy uncertainties pose external challenges.

Challenges to Sustaining the Goldilocks Moment:

- **Fiscal Discipline**: High fiscal deficits (5.1% of GDP in FY25, per IMF estimates) could strain public finances if subsidies or populist measures increase.
- **Structural Reforms**: Addressing slowdowns in real estate and automobiles requires targeted interventions like urban housing schemes or EV incentives.
- **Geopolitical Risks**: Ongoing global uncertainties (e.g., U.S.-China trade tensions) could disrupt India's export-led growth.

Way Forward:

- Strengthen domestic manufacturing to reduce import dependence (e.g., via PLI schemes).
- Enhance financial inclusion to boost household savings and reduce debt.
- Invest in renewable energy to mitigate oil price volatility risks.

SCHEME TO PROMOTE MANUFACTURING OF ELECTRIC PASSENGER CARS IN INDIA (SPMEPCI)

Source: *Ministry of Heavy Industries Notification, June 2025; The Indian Express, June 2025*

UPSC Connection: Manufacturing, Government Policies; Relevant for UPSC Prelims and Mains (GS Paper 3 – Economic Development, Environment)

Overview:

The **Scheme to Promote Manufacturing of Electric Passenger Cars in India (SPMEPCI)**, notified by the Ministry of Heavy Industries in 2025, aims to boost electric vehicle (EV) manufacturing and adoption by attracting global investments and reducing import duties for companies committing to local production.

Definition/Detailing:

- SPMEPCI is a policy to incentivize domestic EV manufacturing by offering reduced customs duties to foreign manufacturers who invest in India, aligning with the **Make in India** initiative.
- It seeks to position India as a global EV manufacturing hub, enhancing job creation, technology transfer, and affordability of EVs for Indian consumers.

Comparison:

- **SPMEPCI vs. FAME Schemes**: SPMEPCI focuses on attracting global manufacturers with high investment thresholds, while FAME (I and II) emphasizes consumer subsidies and domestic EV adoption.
- **India vs. China**: China leads in EV production (60% of global EV sales), supported by state-backed incentives and battery manufacturing. SPMEPCI aims to bridge this gap by attracting global players like Tesla.

Key Features/Details:

- **Incentives**:
- Approved companies can import up to **8,000 Completely Built Units (CBUs)** annually at a reduced customs duty of **15%** (for vehicles with a minimum CIF value of $35,000) for five years.
- Total duty foregone is capped at **₹6,484 crore** or the actual investment, whichever is lower.
- **Eligibility Criteria**:
- Minimum investment of **₹4,150 crore** within three years to establish manufacturing facilities.
- Achieve **25% domestic value addition (DVA)** within three years and **50% DVA** within five years.
- Companies must have global revenues of **₹10,000 crore** at the time of application.
- **Flexibility**:
- Allows **brownfield investments** (expanding existing facilities) alongside greenfield projects, broadening participation.
- **Significance:**
- Attracts global EV giants, strengthening India's manufacturing ecosystem.
- Reduces EV costs for consumers through lower import duties.
- Promotes technology transfer and local job creation.

Challenges in EV Manufacturing:

- **Supply Chain Gaps**: India relies on imported EV components (e.g., lithium-ion batteries), requiring robust localization.
- **Skilled Workforce**: Lack of trained personnel in EV technology hinders scalability.
- **Consumer Awareness**: High upfront costs and range anxiety deter EV adoption.

Way Forward:

- Strengthen domestic battery production through PLI schemes.
- Expand skill development programs for EV manufacturing.
- Launch awareness campaigns to boost consumer confidence in EVs.

INDIA RANKS 71ST ON ENERGY TRANSITION INDEX 2025

Source: *World Economic Forum, June 2025; The Economic Times, June 2025*

UPSC Connection: Energy, International Reports; Relevant for UPSC Prelims and Mains (GS Paper 3 – Environment, Energy)

Overview:

India ranks 71st out of 118 countries in the **Energy Transition Index (ETI) 2025** by the World Economic Forum, with a score of 53.3, reflecting progress in clean energy but challenges in grid reliability and rural energy access.

Definition/Detailing:

- **ETI** ranks countries based on their transition from fossil fuels to clean energy, using 43 indicators across energy security, equity, sustainability, and transition readiness.
- India's rank dropped from 63rd (2024) to 71st (2025), despite advances in energy intensity and clean energy investments.

Comparison:

- **India vs. Sweden**: Sweden tops ETI (score 77.5) with robust renewable energy policies, while India lags in grid reliability and infrastructure.
- **India vs. China**: China ranks higher (20th) due to its leadership in renewable energy (40% of global solar capacity).

Key Features/Details:

- **Indicators**:
- **Energy Security**: Stable and diverse energy supply.
- **Equity**: Access to energy for all.
- **Sustainability**: Low-carbon energy sources.
- **Transition Readiness**: Political commitment, finance, innovation, infrastructure, and human capital.
- **India's Performance**:
- Progress in reducing energy intensity and CH4 emissions.
- Challenges in grid reliability, rural energy access, and import dependence.
- **Global Highlights**:
- Only 28% of countries advance across all ETI dimensions.
- Energy demand rose 2.2% in 2024 due to AI, data centers, and electrification.

Way Forward:

- Invest in grid modernization and rural electrification.
- Enhance renewable energy financing and workforce skilling.
- Reduce fossil fuel dependence through policy incentives.

ADDRESSING POLICY GAPS IN INDIA'S EV JOURNEY

Source: *Ministry of Heavy Industries, June 2025; The Economic Times, June 2025*

UPSC Connection: Manufacturing, Government Policies, Environment; Relevant for UPSC Prelims and Mains (GS Paper 3 – Economic Development, Environment)

Overview:

India's electric vehicle (EV) journey, which began with the FAME scheme in 2015, has made significant strides but faces policy gaps in subsidies, charging infrastructure, and R&D. Addressing these gaps is critical to

achieving India's EV adoption and manufacturing goals.

Definition/Detailing:

- India's EV policy framework includes **FAME-I (2015–2019)**, **FAME-II (2019–2024)**, **PM E-DRIVE (2024)**, and **SPMEPCI (2025)**, aimed at promoting EV adoption, manufacturing, and infrastructure development.
- Despite progress, gaps in subsidy disbursement, domestic value addition (DVA), and charging infrastructure hinder scalability.

Comparison:

- **India vs. Global Leaders**: China and Norway lead in EV adoption (60% and 80% of vehicle sales, respectively), supported by extensive charging networks and R&D investments. India's one charger per 135 EVs (2024) lags behind the global average (1:6–20).
- **FAME-I vs. FAME-II**: FAME-I focused on demand incentives but supported inefficient technologies (e.g., lead-acid batteries). FAME-II introduced localization norms but struggled with implementation.

Key Features/Details:

- **FAME-I (2015–2019)**:
- Provided demand-side incentives (e.g., price reductions) and supported 278,000 EVs.
- Criticized for subsidizing inefficient technologies and slow implementation.
- **FAME-II (2019–2024)**:
- Outlay of **₹10,000 crore**, expanded to buses, two-wheelers, and three-wheelers with stricter safety and localization norms.
- Criticized for delayed subsidy payments, inadequate charging infrastructure (10% of budget), and limited R&D focus.
- **PM E-DRIVE (2024)**:
- Budget of **₹10,900 crore**, with **₹2,000 crore** for charging stations to address infrastructure gaps.
- **SPMEPCI (2025)**:
- Focuses on global investments and manufacturing (detailed above).
- **Key Gaps**:
- **Delayed Subsidies**: Late reimbursement to OEMs causes working capital shortages.
- **Demand Dependency**: Subsidy cuts (e.g., two-wheeler EVs) reduced demand by 25%.
- **Unclear DVA Guidelines**: Lack of clarity on indigenous components hinders localization.
- **Charging Infrastructure**: Only 1 charger per 135 EVs, compared to global benchmarks.
- **R&D Lag**: Reliance on imported components due to limited domestic innovation.

Way Forward:

- Implement **Direct Benefit Transfer (DBT)** for subsidies to ensure timely disbursal.
- Define clear DVA metrics to promote localization.
- Expand charging infrastructure to meet the 2030 target of 3.9 million stations.
- Incentivize R&D for battery technology and local component manufacturing.

CENTRAL BANK DIGITAL CURRENCY (CBDC)

Source: *Reserve Bank of India, June 2025; The Hindu, June 2025*

UPSC Connection: Banking and Monetary Policy; Relevant for UPSC Prelims and Mains (GS Paper 3 – Economic Development, Technology)

Aspect	Fiat Currency	Central Bank Digital Currency (CBDC)	Cryptocurrency	Stablecoin
Issuer	Central Bank (e.g., Federal Reserve, RBI)	Central Bank	Private Entity or Decentralized Network	Private Entity
Value Source	Backed by government trust and economic stability	Backed by central bank's guarantee	Market-driven, no intrinsic backing	Pegged to an asset (e.g., USD, gold)
Legal Tender	Yes, recognized as official currency	Yes, typically recognized as legal tender	Varies (e.g., El Salvador accepts Bitcoin)	Varies, not typically legal tender
Medium of Payment	Widely accepted for transactions	Accepted where implemented	Accepted by some merchants, varies by region	Accepted by some platforms, often crypto-related
Examples	USD, EUR, INR (physical notes and coins)	e-CNY (China), e-krona (Sweden), Petro	Bitcoin (BTC), Ethereum (ETH), Dogecoin	Tether (USDT), USD Coin (USDC), Diem (defunct)
Technology	Physical cash, electronic banking systems	Blockchain or centralized digital ledger	Decentralized blockchain	Blockchain, often tied to specific protocols
Volatility	Relatively stable, subject to inflation	Stable, tied to fiat currency	Highly volatile, market-driven	Low volatility due to asset pegging
Regulation	Heavily regulated by governments	Regulated by central banks	Limited or no regulation in many regions	Varies, increasing regulatory scrutiny
Use Case	Everyday transactions, store of value	Digital payments, financial inclusion	Investment, decentralized finance (DeFi)	Crypto trading, cross-border payments
Credit Creation	Can create credit through the fractional reserve banking system.	Cannot create credit; only lend from funds raised through other sources.		
Branch Network	Extensive branch and ATM networks for customer access.	Limited physical presence; often rely on digital platforms or agents.		
Examples	State Bank of India, HDFC Bank, ICICI Bank.	Bajaj Finance, Mahindra Finance, Muthoot Finance.		

Overview:

The RBI's **Central Bank Digital Currency (CBDC)**, or e-rupee, saw a 334% increase in circulation to ₹1,016 crore in FY25 from ₹234 crore in FY24. Launched in 2022, CBDC is a digital legal tender aimed at promoting a cashless economy and financial inclusion.

Definition/Detailing:

- **CBDC** is a tokenized digital version of the Indian rupee, issued by the RBI as a sovereign

currency, accepted as legal tender for transactions.

- It aligns with monetary policy, appears as a liability on the RBI's balance sheet, and is freely convertible to cash or bank money.

Key Features/Details:

- **Characteristics**:
- Legal tender, accepted by all citizens, enterprises, and government agencies.
- Fungible and accessible without a bank account, lowering transaction costs.
- **Types**:
- **Retail CBDC**: For public day-to-day transactions.
- **Wholesale CBDC**: For financial institutions (e.g., banks, NBFCs).
- **Legal Framework**:
- Enabled by the **Finance Act 2022**, amending the RBI Act, 1934, to include digital currency issuance.
- **Use Cases**:
- Settlement of government securities, inter-bank lending, and direct benefit transfers (e.g., Kisan Credit Card loans).
- **Benefits**:
- Promotes cashless economy, reducing cash-to-GDP ratio.
- Enhances financial inclusion and fintech development.
- Improves transaction traceability, curbing corruption and money laundering.
- Facilitates seamless cross-border payments.
- **Challenges:**
- **Bank Disintermediation**: Shift to CBDC may reduce bank deposits, raising lending rates.
- **Bank Runs**: CBDC's liquidity could accelerate bank runs during crises.
- **Security Risks**: Cyber-attacks could undermine public trust in CBDC.
- **Privacy Concerns**: Transaction traceability raises data privacy issues.

Way Forward:

- Strengthen cybersecurity for CBDC infrastructure.
- Enact robust data privacy laws to balance traceability and individual rights.
- Promote public awareness to boost CBDC adoption.

FROM FARM TO SHELF: FOOD PROCESSING SECTOR

Source: *Ministry of Food Processing Industries, June 2025; The Indian Express, June 2025*

UPSC Connection: Agriculture, Food Processing; Relevant for UPSC Prelims and Mains (GS Paper 3 – Agriculture, Economic Development)

Overview:

The food processing sector, contributing 11% to agricultural GVA and 10% to manufacturing GVA, is a sunrise industry driving rural empowerment, agricultural diversification, and export growth. Government schemes like PM Kisan Sampada Yojana and PMFME have boosted its growth.

Definition/Detailing:

- **Food Processing**: Techniques to manufacture and preserve food to enhance shelf life, quality, and functionality.
- The sector reduces post-harvest losses (₹92,000 crore annually), promotes exports, and supports inclusive growth through job creation and entrepreneurship.

Comparison:

- **India vs. Developed Nations**: India's food processing sector is 32% of agricultural output, compared to 60–70% in developed nations, indicating growth potential.
- **Organized vs. Unorganized**: The sector has shifted from unorganized to organized production, driven by government support and private investment.

Key Features/Details:

- **Sectoral Contribution**:
- Accounts for 11% of agricultural GVA and 10% of manufacturing GVA.
- Key products include dairy, fruits, vegetables, grains, and consumer foods.
- **Significance:**
- Reduces post-harvest losses through cold chain infrastructure.
- Boosts exports (e.g., Bihar's Makhana to the U.S. and Canada).
- Promotes nutrition through food fortification.
- Creates jobs and supports secondary agriculture.
- Establishes Forward and Backward linkages.
- **Government Initiatives**:
- **PM Kisan Sampada Yojana**: Created 250 lakh MT processing capacity and 7.6 lakh jobs.
- **PMFME**: Formalized micro-enterprises with ₹11,000 crore in loans and 75 incubation centers.
- **PLI Scheme**: Added 67 lakh MT capacity and 3.3 lakh jobs.
- **Budget 2024–25**: Supports 50 irradiation units, 100 NABL labs, and a National Makhana Board.

Way Forward:

- Expand cold chain infrastructure to reduce losses.
- Promote food-tech innovation through R&D incentives.
- Strengthen export branding for products like Makhana.

CABINET APPROVES GLOBAL POTATO RESEARCH CENTER IN AGRA

Source: *Union Cabinet, June 2025; The Hindu, June 2025*

UPSC Connection: Agriculture, Food Processing; Relevant for UPSC Prelims and Mains (GS Paper 3 – Agriculture, Economic Development)

Overview:

The Union Cabinet approved the establishment of the **CIP-South Asia Regional Centre (CSARC)** in Agra, Uttar Pradesh, in collaboration with the Peru-based International Potato Center (CIP). The center aims to enhance potato and sweet potato productivity, food security, and exports.

Definition/Detailing:

- **CSARC** will focus on developing climate-resilient, disease-free potato and sweet potato varieties, improving post-harvest management, and boosting farmers' incomes.
- The project, costing ₹171 crore (India: ₹111.5 crore, CIP: ₹60 crore), will serve India's potato belt and South Asia.

Comparison:

- **CSARC vs. IRRI-SARC**: Similar to the International Rice Research Institute's center in Varanasi (2017), CSARC brings global expertise to address regional agricultural challenges.

- **India vs. China**: India is the second-largest potato producer, but its yield (25 tonnes/ha) lags behind China's (40 tonnes/ha) due to seed quality issues.

Key Features/Details:

- **Objectives**:
- Enhance food and nutrition security, farmers' incomes, and job creation.
- Develop high-yield, climate-resilient varieties.
- **Functions**:
- Access to CIP's global germplasm for high-quality seeds.
- Research on post-harvest management and value addition.
- **Significance:**
- Boosts India's potato yield (currently 25 tonnes/ha vs. potential 50 tonnes/ha).
- Reduces seed import dependence.
- Enhances export potential and supports food processing industries.

Way Forward:

- Scale up seed production and distribution networks.
- Promote value-added potato products for exports.
- Integrate CSARC research with local extension services.

FLIPKART SECURES NBFC LICENCE FROM RBI

Source: *Reserve Bank of India, June 2025; The Economic Times, June 2025*

UPSC Connection: Banking and Finance; Relevant for UPSC Prelims and Mains (GS Paper 3 – Economic Development)

Overview:

Walmart-owned Flipkart has received a **Non-Banking Financial Company (NBFC)** licence from the RBI, enabling it to directly offer loans for EMI and Buy Now, Pay Later (BNPL) schemes. This marks the first time a major e-commerce player in India has secured such a licence, boosting financial inclusion and fintech innovation.

Definition/Detailing:

- An **NBFC** is a financial institution registered under the Companies Act, 1956, providing services like loans, insurance, and pensions but not holding a full banking license or accepting demand deposits.
- Flipkart's NBFC licence allows it to lend directly to customers and sellers via its platform and fintech app **super.money**, enhancing profitability and financial access.

Comparison:

- **Flipkart vs. Other NBFCs**: Unlike traditional NBFCs (e.g., Bajaj Finance), Flipkart leverages its e-commerce ecosystem to offer seamless credit to consumers and seller.

Key Features/Details:

- **Flipkart's NBFC Licence**:
- Enables direct lending for EMIs and BNPL schemes, bypassing third-party lenders.
- Supports financing for sellers on its platform, boosting MSME growth.
- **NBFC Sector**: Contributes **12.5% to India's GDP** and accounts for **22.5% of total bank credit** in 2024.
- Funded by bank loans, commercial papers, and debentures (75% of borrowings).

Types of NBFCs:

- **Deposit-taking (NBFC-D)** and **Non-deposit-taking (NBFC-ND)**.
- **Systemically Important NBFCs (NBFC-ND-SI)**: Asset size ≥ ₹500 crore.

Aspect	Fiat Currency	Central Bank Digital Currency (CBDC)	Cryptocurrency	Stablecoin
Issuer	Central Bank (e.g., Federal Reserve, RBI)	Central Bank	Private Entity or Decentralized Network	Private Entity
Value Source	Backed by government trust and economic stability	Backed by central bank's guarantee	Market-driven, no intrinsic backing	Pegged to an asset (e.g., USD, gold)
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Examples	State Bank of India, HDFC Bank, ICICI Bank.	Bajaj Finance, Mahindra Finance, Muthoot Finance.		

- **Role of NBFCs**:
- Enhance financial inclusion for MSMEs and underserved populations.
- Support infrastructure projects and promote capital formation.
- Strengthen financial markets through leasing and hire-purchase.

Challenges:

- **Regulatory Risks**: Over-lending by NBFCs could lead to systemic risks, as seen in the IL&FS crisis (2018).

- **Credit Overreach**: Easy BNPL schemes may increase household debt, requiring consumer protection measures.

Way Forward:

- Strengthen RBI oversight to prevent financial instability.
- Promote digital literacy to ensure responsible borrowing.
- Expand NBFC lending to rural and MSME sectors.

EMPOWERING WOMEN IN AGRICULTURE

Source: *United Nations General Assembly, June 2025; The Indian Express, June 2025*

UPSC Connection: Agriculture, Women Empowerment; Relevant for UPSC Prelims and Mains (GS Paper 1 – Social Issues, GS Paper 3 – Agriculture)

Overview:

The UN General Assembly declared 2026 as the **International Year of the Woman Farmer**, recognizing women's critical role in global agriculture (60–80% of food production in developing countries) and their challenges, such as limited land ownership and credit access. In India, women constitute 64.4% of the agricultural workforce but face systemic barriers.

Definition/Detailing:

- Women farmers in India contribute significantly to agriculture (80% of economically active women), yet their role is undervalued due to gender biases in land rights, credit access, and policymaking.
- The UN resolution aims to raise awareness and address these challenges to promote equitable agricultural development.

Comparison:

- **India vs. South Asia**: Women form 39% of South Asia's agricultural workforce, but India's share (64.4%) is higher, reflecting greater dependence on women in rural economies.
- **Women vs. Men Farmers**: Women own only 8.3–14% of agricultural land compared to men, limiting their access to institutional credit and policy benefits.

Key Features/Details:

- **Women's Role**:
- Women contribute 60–80% to food production in developing countries and 64.4% to India's agricultural workforce (PLFS 2023–24).
- **Challenges:**
- **Land Ownership**: Only 8.3% (NFHS-5) to 14% of agricultural landholders are women, restricting credit access.
- **Credit Access**: Less than 15% of women farmers access institutional credit (NABARD 2016–17), relying on exploitative informal sources.
- **Policy Bias**: Agricultural policies are male-centric, ignoring women's needs (M.S. Swaminathan).
- **Time Poverty**: Women spend 3–5 hours more daily on unpaid care work (Time Use Survey 2019).
- **Technology Gap**: Limited access to mobile phones and mechanized tools designed for men.
- **Climate Impact**: Women face higher risks from crop failures and increased domestic burdens.
- **Government Initiatives**:
- **Mahila Kisan Sashaktikaran Pariyojana (MKSP)**: Enhances skills and resource access.

- **Sub-Mission on Agricultural Mechanisation**: Offers 50–80% subsidies for women.
- **National Food Security Mission (NFSM)**: Allocates 30% funds for women in some states.
- **DAY-NRLM and SHGs**: Promote group farming and micro-financing.

Way Forward:

- Design women-centric farm tools and technologies.
- Secure land ownership through joint titles.
- Expand SHGs and microfinance to enhance credit access.
- Collect gender-disaggregated data for targeted policymaking.

NEED TO REVISIT FOOD AND FERTILISER SUBSIDIES

Source: *Ministry of Finance, June 2025; The Hindu, June 2025*

UPSC Connection: Agriculture, Subsidies; Relevant for UPSC Prelims and Mains (GS Paper 3 – Agriculture, Economic Development)

Overview:

With extreme poverty at 5.3% and nominal GDP at $4.19 trillion, India must rationalize food and fertiliser subsidies to reduce fiscal burden, improve efficiency, and promote sustainable agriculture. Current subsidies distort markets and fail to address structural issues.

Definition/Detailing:

- **Food Subsidies**: Provide free food (5 kg/person/month) to over 800 million people under the Public Distribution System (PDS), with a budget of ₹2.03 lakh crore (FY26).
- **Fertiliser Subsidies**: Support farmers with subsidized inputs, budgeted at ₹1.56 lakh crore (FY25–26).
- These subsidies aim to ensure food security and agricultural productivity but face issues of inefficiency, leakage, and environmental harm.

Comparison:

- **India vs. China**: China's agricultural subsidies focus on R&D and precision farming, while India's input-based subsidies promote monoculture and overuse of resources.
- **PDS vs. MSP**: PDS ensures food access, but MSP's wheat-rice focus distorts cropping patterns, neglecting pulses and millets.

Key Features/Details:

- **Poverty Decline**:
- Extreme poverty dropped to 5.3%, with nominal GDP at $4.19 trillion and PPP GDP at $17.65 trillion (3rd globally).
- Per capita income (PPP) rose to $12,131, with moderate inequality (Gini Index 0.33).
- **Issues with Subsidies**:
- **Fiscal Burden**: Food and fertiliser subsidies consume significant budgetary resources.
- **Exclusionary**: Large farmers benefit more, while small farmers struggle with access.
- **Distortionary**: Wheat-rice focus leads to monoculture, neglecting diverse crops.
- **Environmental Harm**: Overuse of fertilisers and water degrades soil and resources.
- **Leakages**: PDS suffers from diversion, ghost beneficiaries, and poor-quality delivery.

Way Forward:

- Introduce **food coupons** for nutritious items (pulses, milk) to reduce leakages and diversify diets.
- Use **fertiliser coupons** to promote balanced nutrient use and bio-fertilisers.
- Shift to targeted, output-oriented subsidies for efficiency and sustainability.
- Implement DBT for food and fertiliser subsidies.
- Promote crop diversification through MSP for pulses and millets.
- Invest in irrigation and marketing infrastructure to address structural gaps.

MODIFIED INTEREST SUBVENTION SCHEME (MISS)

Source: *Cabinet Committee on Economic Affairs, June 2025; The Indian Express, June 2025*

UPSC Connection: Agriculture, Financial Inclusion; Relevant for UPSC Prelims and Mains (GS Paper 3 – Agriculture, Economic Development)

Overview:

The **Modified Interest Subvention Scheme (MISS)**, continued for 2025–26, provides 7.7 crore farmers with short-term credit at subsidized rates (7%) via Kisan Credit Cards (KCC), with an additional 3% subsidy for prompt repayment, reducing the effective rate to 4%.

Definition/Detailing:

- **MISS** is a Central Sector Scheme that subsidizes interest on short-term loans up to ₹3 lakh (increased to ₹5 lakh in Budget 2025–26) to enhance agricultural productivity and financial inclusion.
- Administered by RBI and NABARD, it includes post-harvest loans against Negotiable Warehouse Receipts (NWRs).

Comparison:

- **MISS vs. PM Kisan**: MISS focuses on credit access, while PM Kisan provides direct income support (₹6,000/year).
- **India vs. Other Nations**: India's interest subvention is unique, as most countries provide direct subsidies or insurance to farmers.

Key Features/Details:

- **Subsidies**:
- 1.5% interest subvention on KCC loans up to ₹3 lakh (now ₹5 lakh).
- Additional 3% subsidy for prompt repayment, reducing the rate to 4%.
- **Coverage**:
- Benefits 7.7 crore farmers, especially small and marginal ones.
- Includes post-harvest loans to prevent distress sales.
- **Implementation**:
- Monitored by RBI and NABARD for effective disbursal.

Way Forward:

- Expand KCC coverage to tenant farmers.
- Integrate MISS with DBT for seamless disbursal.
- Promote digital platforms for loan applications.

INDIA'S FIRST HOUSEHOLD INCOME SURVEY IN 2026

Source: *Ministry of Statistics and Programme Implementation, June 2025; The Hindu, June 2025*

UPSC Connection: Growth and Development; Relevant for UPSC Prelims and Mains (GS Paper 3 – Economic Development)

Overview:

The Ministry of Statistics and Programme Implementation (MoSPI) will conduct India's first **Household Income Survey** in 2026, guided by a Technical Expert Group led by Dr. Surjit Bhalla, to measure income distribution and economic changes.

Definition/Detailing:

- The survey aims to collect comprehensive data on household incomes, technology's impact on wages, and structural economic shifts over 75 years.
- Previous attempts (e.g., Consumer Expenditure Surveys) failed to capture reliable income data due to underreporting.

Comparison:

- **India vs. Other Nations**: Countries like the U.S. and UK conduct regular income surveys, providing robust data for policy formulation. India's lack of such surveys limits evidence-based policymaking.
- **Income vs. Expenditure Surveys**: Income surveys capture earning patterns, while expenditure surveys (e.g., NSSO) focus on consumption, missing income disparities.

Key Features/Details:

- **Objectives**:
- Measure income distribution and economic welfare.
- Assess technology's impact on wages.
- Understand structural economic changes.
- **Challenges:**
- Underreporting of incomes, especially in informal sectors.
- Difficulty in capturing seasonal employment incomes.
- **Significance:**
- Provides data for targeted welfare policies and inequality reduction.
- Aligns with global best practices for income measurement.

Way Forward:

- Ensure robust methodology to minimize underreporting.
- Integrate survey data with existing databases (e.g., NSSO, PLFS).
- Use findings to refine welfare and tax policies.

GEOGRAPHY and ENVIRONMENT

FRA CELLS TO SPEED UP FOREST RIGHTS IMPLEMENTATION

Source: *PIB, July 1, 2025; The Indian Express, July 2, 2025*

UPSC Connection: Conservation, Tribal Rights; Relevant for UPSC Prelims and Mains (GS Paper II – Governance, GS Paper III – Environment)

Definition/Detailing:

The Central government has sanctioned 324 district-level and 17 state-level FRA Cells under the Dharti Aaba Janjatiya Gram Utkarsh Abhiyan to expedite the implementation of the Forest Rights Act, 2006. These cells aim to address the 14.45% pending forest rights claims and high rejection rates.

Comparison:

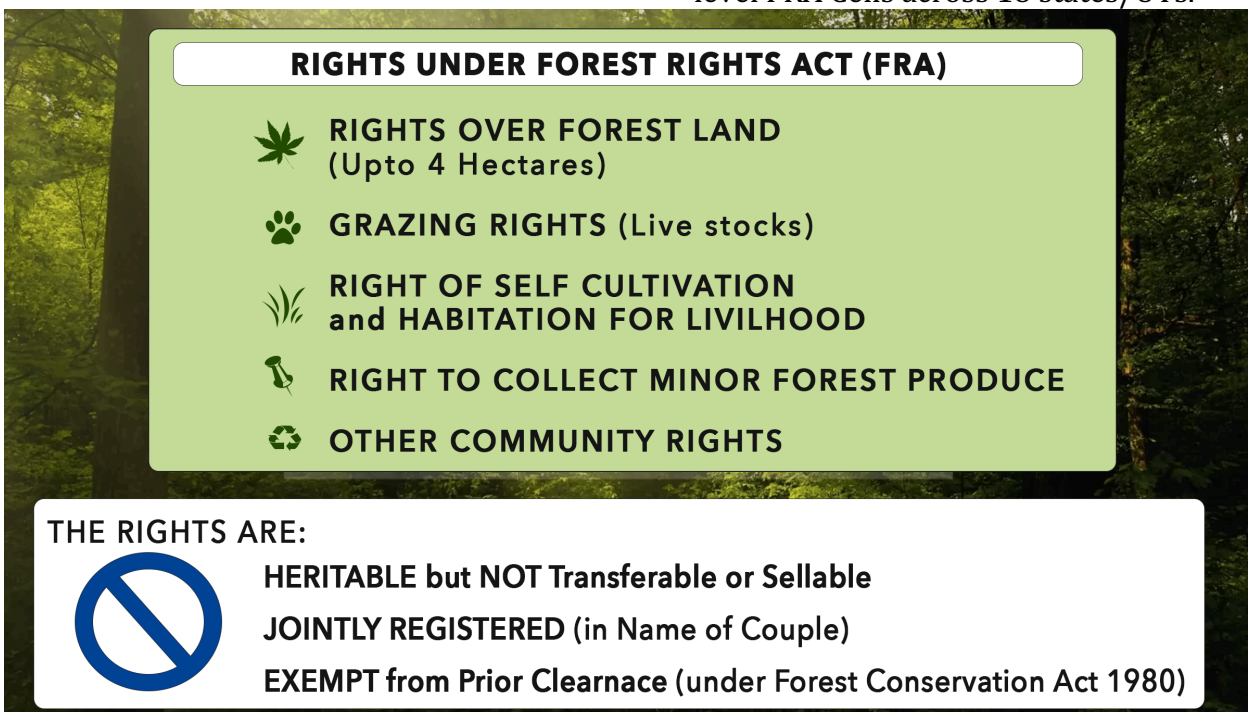
- **FRA Cells vs. Existing Mechanisms:** Unlike Gram Sabhas and DLCs, FRA Cells are centrally funded and focus on documentation and data management.
- **India vs. Global Practices:** Brazil's indigenous land demarcation process offers a model for efficient claim processing, unlike India's slow implementation.

Overview:

With 14.45% of 51.11 lakh forest rights claims pending and 42% rejected, FRA Cells aim to streamline documentation and push claims without interfering in decision-making. The initiative is part of the broader tribal welfare campaign.

Key Features/Details:

- **Objective:** Facilitate FRA implementation for tribal and forest-dwelling communities.
- **Structure:** 324 district-level and 17 state-level FRA Cells across 18 states/UTs.



- **Role:** Assist in documentation, data management, and claim processing.
- **Funding:** Centrally funded through Grants-in-Aid General.
- **Concerns:** Risk of undermining community control and creating a parallel mechanism.

Tribal Rights and Forest Governance:

- **Historical Context:** Colonial policies dispossessed tribal communities, which FRA seeks to rectify.
- **Policy Recommendations:** Strengthening Gram Sabhas and reducing rejections will enhance trust.
- **Future Directions:** Integrating FRA with sustainable development goals will ensure holistic tribal welfare.

ARAVALLI GREEN WALL PROJECT

Source: *PIB, June 5, 2025; The Hindu, June 6, 2025*

UPSC Connection: Conservation, Environment; Relevant for UPSC Prelims and Mains (GS Paper III – Environment, GS Paper I – Geography)

Definition/Detailing:

Launched on World Environment Day 2025, the Aravalli Green Wall Project aims to restore the 700-km Aravalli mountain range through reforestation, water body revival, and community engagement. It creates a 1400-km green belt to combat desertification and enhance biodiversity.

Comparison:

- **Aravalli vs. Great Green Wall:** Inspired by Africa's Great Green Wall, the Aravalli project is smaller but tailored to India's ecological needs.
- **Pre-2025 vs. Post-2025:** Earlier conservation efforts were fragmented; the project offers a comprehensive approach.

Overview:

The project, launched with a sapling planted in Delhi's Ridge, aims to restore the Aravalli range across four states. It involves native species planting, water body revival, and eco-tourism promotion, aligning with India's international environmental commitments.

Key Features/Details:

- **Objective:** Restore ecology, prevent desertification, and enhance biodiversity.
- **Scope:** 1400-km green belt across Delhi, Haryana, Rajasthan, and Gujarat.
- **Initiatives:** Plant native species, revive 75 water bodies, develop 1,000 nurseries.
- **Monitoring:** Geo-tagged plantations via the Meri LiFE portal.
- **Significance:** Supports UNCCD, UNCBD, and UNFCCC commitments.

Conservation and Sustainable Development:

- **Ecological Significance:** The Aravallis prevent Thar Desert expansion, critical for northern India's climate.
- **Policy Recommendations:** Strengthening anti-mining laws and community incentives will ensure success.
- **Future Directions:** Integrating the project with India's net-zero goals will enhance impact.

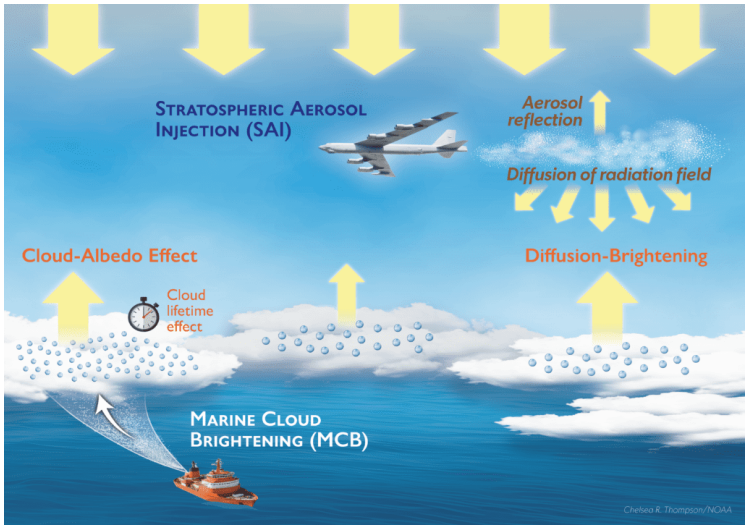
STRATOSPHERIC AEROSOL INJECTION (SAI)

Source: *The Hindu, July 10, 2025; Nature Journal, July 8, 2025*

UPSC Connection: Climate Change, Emerging Technologies; Relevant for UPSC Prelims and Mains (GS Paper III – Environment, GS Paper III – Science and Technology)

Definition/Detailing:

Stratospheric Aerosol Injection (SAI) is a geoengineering technique to cool the Earth by injecting reflective aerosols (e.g., sulphur dioxide) into the stratosphere, increasing albedo and reducing surface temperatures. Inspired by volcanic eruptions, SAI is a controversial climate mitigation strategy.



Comparison:

- **SAI vs. Other Geoengineering:** Unlike carbon capture, SAI directly cools the planet but does not address CO2 levels.
- **India vs. Global Research:** India's research on SAI is limited compared to the US and EU, which are exploring its feasibility.

Overview:

A recent study highlights SAI's potential to cool the Earth by 0.6°C–1°C through annual injections of 7.6–21 million tonnes of sulphur dioxide. However, risks like ozone depletion and geopolitical tensions limit its adoption.

Key Features/Details:

- **Mechanism:** Injects aerosols to reflect sunlight, inspired by volcanic cooling effects.
- **Effectiveness:** 12 million tonnes/year at 13 km altitude cools by 0.6°C; 7.6 million tonnes at higher altitudes is more effective.
- **Risks:** Ozone depletion, acid rain, and geopolitical conflicts over climate control.
- **Challenges:** Masks warming without addressing emissions, risking complacency.
- **Research Needs:** Optimal materials, timing, and locations require further study.

Geoengineering and Climate Policy:

- **Ethical Concerns:** SAI's unilateral use could disrupt global climate patterns, requiring governance frameworks.
- **Policy Recommendations:** India should invest in SAI research while prioritizing emission reductions.
- **Future Directions:** Integrating SAI with renewable energy strategies will ensure holistic climate action.

INDIA ENTERS TOP 100 IN GLOBAL SDG RANKINGS 2025

Source: *The Times of India (July 10, 2025), Hindustan Times (July 11, 2025)*

UPSC Connection: Sustainable Development, International Relations; Relevant for UPSC Prelims and Mains (GS2 – International Relations, GS3 – Environment, Economic Development).

Definition/Detailing:

The Sustainable Development Report (SDR) 2025, released by the UN Sustainable Development Solutions Network (SDSN), ranks India 99th with a score of 67, marking its entry into the top 100 countries for the first time since 2016. The SDR assesses progress toward the 17 Sustainable Development Goals (SDGs) adopted in 2015.

Comparison:

- Compared to 2024 (rank 109), India's 2025 ranking reflects significant progress, particularly in SDG 1 (No Poverty), SDG 8 (Decent Work), SDG 13 (Climate Action), and SDG 15 (Life on Land).
- Unlike European countries (e.g., Finland, Sweden), which dominate the top ranks, India lags in SDG 2 (Zero Hunger), SDG 5 (Gender Equality), and SDG 16 (Peace and Justice).

Overview:

India's improved SDG ranking highlights its efforts in poverty reduction, climate action, and economic growth, though challenges remain in hunger, gender equality, and

governance. The global SDG target achievement rate remains low, with only 17% of targets on track for 2030.

Key Features/Details:

- **Report**: Released by UN SDSN; measures progress on 17 SDGs.
- **India's Performance**: Rank 99, score 67; first time in top 100 since 2016.
- **Strong Areas**: SDG 1 (No Poverty), SDG 8 (Decent Work), SDG 13 (Climate Action), SDG 15 (Life on Land).
- **Weak Areas**: SDG 2 (Zero Hunger), SDG 5 (Gender Equality), SDG 16 (Peace and Justice).
- **Global Context**: Top 20 countries are mostly European; only 17% of SDG targets globally are on track due to conflicts, structural weaknesses, and limited finances.

India's SDG Strategy:

- India's NITI Aayog coordinates SDG implementation, with state-level SDG indices to monitor progress.
- Key initiatives like Swachh Bharat, renewable energy expansion, and afforestation align with multiple SDGs, but addressing structural weaknesses (e.g., malnutrition, judicial delays) is critical.

MASSIVE ERUPTION IN ITALY'S MOUNT ETNA

Source: *The Indian Express (July 14, 2025), The Hindu (July 15, 2025)*

UPSC Connection: Physical Geography, Disaster Management; Relevant for UPSC Prelims and Mains (GS1 – Geography, GS3 – Disaster Management).

Definition/Detailing:

Mount Etna, Europe's largest active stratovolcano, located on Sicily's east coast, recently erupted due to increased internal pressure, causing a southeast crater collapse and hot lava flows. Designated a UNESCO World Heritage Site since 2013, it is known for frequent eruptions.

Comparison:

- Compared to other active volcanoes like Vesuvius (Italy) or Kilauea (Hawaii), Etna's frequent eruptions are less explosive but pose ongoing risks to nearby populations.
- Unlike dormant volcanoes, Etna's active status requires constant monitoring, similar to India's Barren Island volcano.

Overview:

The eruption of Mount Etna, characterized as a Strombolian eruption, highlights the dynamic nature of stratovolcanoes and their impact on local communities, emphasizing the need for robust disaster management systems.

Key Features/Details:

- **Location**: East coast of Sicily, Italy; largest island in the Mediterranean.
- **Characteristics**: Europe's largest active stratovolcano; highest peak in Italy south of the Alps; UNESCO World Heritage Site (2013).
- **Eruption History**: Over 60 flank eruptions and numerous summit eruptions since 1600.
- **Recent Eruption**: Strombolian eruption caused by gas pressure, leading to southeast crater collapse and lava flows.

Disaster Management Lessons:

- Etna's frequent eruptions underscore the need for real-time monitoring systems, early warning mechanisms, and community preparedness, lessons applicable to India's multi-hazard disaster management strategy.

KERALA'S DEMAND TO AMEND THE WILDLIFE PROTECTION ACT

Source: *The Hindu, July 4, 2025; The Indian Express, July 5, 2025*

UPSC Connection: Conservation, Human-Wildlife Conflict; Relevant for UPSC Prelims and Mains (GS Paper III – Environment)

Definition/Detailing:

Kerala has urged amendments to the Wildlife Protection Act, 1972, to allow controlled culling of animals like bonnet macaques and wild boars causing human-wildlife conflicts. The state seeks region-specific and seasonal culling to address agricultural losses and over 900 deaths from wildlife attacks (FY17–FY25).

Comparison:

- **Kerala vs. Other States:** Unlike Himachal Pradesh, which declares monkeys as vermin, Kerala seeks broader amendments for multiple species.

- **India vs. Global Practices:** Australia's kangaroo culling policies offer a model for controlled management, unlike India's restrictive framework.

Overview:

Kerala faces significant human-wildlife conflicts, with 273 of 941 village local bodies identified as hotspots. The state seeks amendments to enable proactive action against problem animals while balancing conservation goals.

Key Features/Details:

- **Conflict Statistics:** Over 900 deaths from wildlife attacks (FY17–FY25); bonnet macaques and wild boars cause significant agricultural losses.
- **Demands:** Amend WPA, 1972, to allow region-specific culling and reclassify bonnet macaques from Schedule I.
- **Legal Constraints:** Current laws require non-lethal measures before culling, delaying action.
- **Conservation Balance:** Proposals aim to protect both human interests and wildlife.
- **Challenges:** Balancing conservation with human safety and agricultural needs.

Human-Wildlife Conflict Management:

- **Root Causes:** Habitat loss and human encroachment drive conflicts, requiring holistic solutions.
- **Policy Recommendations:** Compensation schemes and community-based conservation can mitigate conflicts.
- **Future Directions:** Integrating technology (e.g., early warning systems) will enhance conflict management.

KERALA'S WILDLIFE TROPHY AMNESTY PROPOSAL

Source: *The Indian Express, July 6, 2025; The Hindu, July 7, 2025*

UPSC Connection: Conservation, Wildlife Governance; Relevant for UPSC Prelims and Mains (GS Paper III – Environment)

Definition/Detailing:

Kerala has proposed a one-time amnesty for individuals possessing wildlife trophies under Section 40 of the Wildlife Protection Act, 1972, to allow legal heirs to declare inherited items. The last such amnesty expired in 2003, and illegal possession carries severe penalties.

Comparison:

- **Kerala vs. Other States:** Unlike other states, Kerala's proposal targets legal heirs with valid ownership certificates, addressing a specific gap.
- **India vs. Global Practices:** Australia's amnesty programs for illegal wildlife products offer a model for regulated declarations.

Overview:

The proposal aims to address illegal wildlife trophy possession by offering a one-time amnesty, encouraging legal declarations while maintaining conservation goals. It requires approval from the Union Ministry of Environment, Forest, and Climate Change.

Key Features/Details:

- **Objective:** Allow legal heirs to declare inherited wildlife trophies.
- **Legal Framework:** Section 40 of WPA, 1972, allows voluntary surrender without compensation.
- **Penalties for Non-Compliance:** 3–7 years imprisonment and fines of ₹25,000 or more.
- **Rationale:** Address inherited trophies with valid certificates but undeclared names.
- **Challenges:** Ensuring amnesty does not encourage illegal trade.

Wildlife Conservation and Governance:

- **Historical Context:** Illegal trophy possession stems from colonial hunting practices.
- **Policy Recommendations:** Digital tracking of declared trophies will enhance enforcement.
- **Future Directions:** Public awareness and stricter trade regulations will support conservation.

WHY TOXICITY MATTERS IN MEASURING AIR POLLUTION

Source: *The Indian Express, July 7, 2025; Environmental Research Journal, July 6, 2025*

UPSC Connection: Pollution, Public Health; Relevant for UPSC Prelims and Mains (GS Paper III – Environment)

Definition/Detailing:

A study highlights that air pollution's toxicity, driven by PM2.5 composition, varies across

Indian cities. Toxicity increases sharply above 70 $\mu g/m^3$ due to oxidative stress, necessitating a revised Air Quality Index (AQI) that accounts for chemical composition.

Comparison:

- **India vs. Global Standards:** WHO's PM2.5 guideline (5 $\mu g/m^3$ annual mean) is stricter than India's (40 $\mu g/m^3$), highlighting the need for updated standards.
- **PM2.5 vs. Other Pollutants:** PM2.5's toxicity is higher than larger particles due to its ability to penetrate lungs.

Overview:

The study reveals that PM2.5 toxicity peaks between 70–130 $\mu g/m^3$, driven by oxidative stress from Reactive Oxygen Species (ROS). Biomass and solid waste burning contribute more to toxicity than vehicular emissions, varying by city.

Key Features/Details:

- **Toxicity Threshold:** PM2.5 above 70 $\mu g/m^3$ causes sharp increases in oxidative stress; stabilizes at 130 $\mu g/m^3$.
- **City Variations:** Toxicity varies due to differences in pollutant sources (e.g., biomass vs. vehicular).
- **Oxidative Stress:** ROS overwhelms antioxidants, damaging cells at high PM2.5 levels.
- **AQI Reform:** Current AQI focuses on concentration; incorporating oxidative potential is recommended.
- **Health Impact:** High toxicity increases risks of respiratory and cardiovascular diseases.

Air Pollution and Public Health:

- **Source-Specific Interventions:** Targeting biomass burning and waste management will reduce toxicity.
- **Policy Recommendations:** A revised AQI and public awareness campaigns are essential.
- **Future Directions:** Integrating air quality with health policies will enhance outcomes.

BUILDING-INTEGRATED PHOTOVOLTAICS (BIPV)

Source: *PIB, July 5, 2025; The Hindu, July 6, 2025*

UPSC Connection: Renewable Energy, Infrastructure; Relevant for UPSC Prelims and Mains (GS Paper III – Environment, GS Paper III – Infrastructure)

Definition/Detailing:

Building-Integrated Photovoltaics (BIPV) involves integrating solar panels into building structures (e.g., roofs, facades, windows), replacing conventional materials while generating electricity. With 17 GW of rooftop solar capacity, India sees BIPV as a land-neutral solution to meet its 300 GW solar target by 2030.

Comparison:

- **BIPV vs. Rooftop Solar:** BIPV utilizes multiple building surfaces, generating 3–4 times more power than rooftop systems.
- **India vs. Global Adoption:** Europe leads in BIPV adoption due to policy support, while India faces high costs and policy gaps.

Overview:

BIPV offers a dual-use solution for energy generation and construction, ideal for urban areas with limited rooftop space. India's adoption is limited by costs, import reliance, and lack of incentives, but its 309 GW potential in existing buildings makes it critical for renewable energy goals.

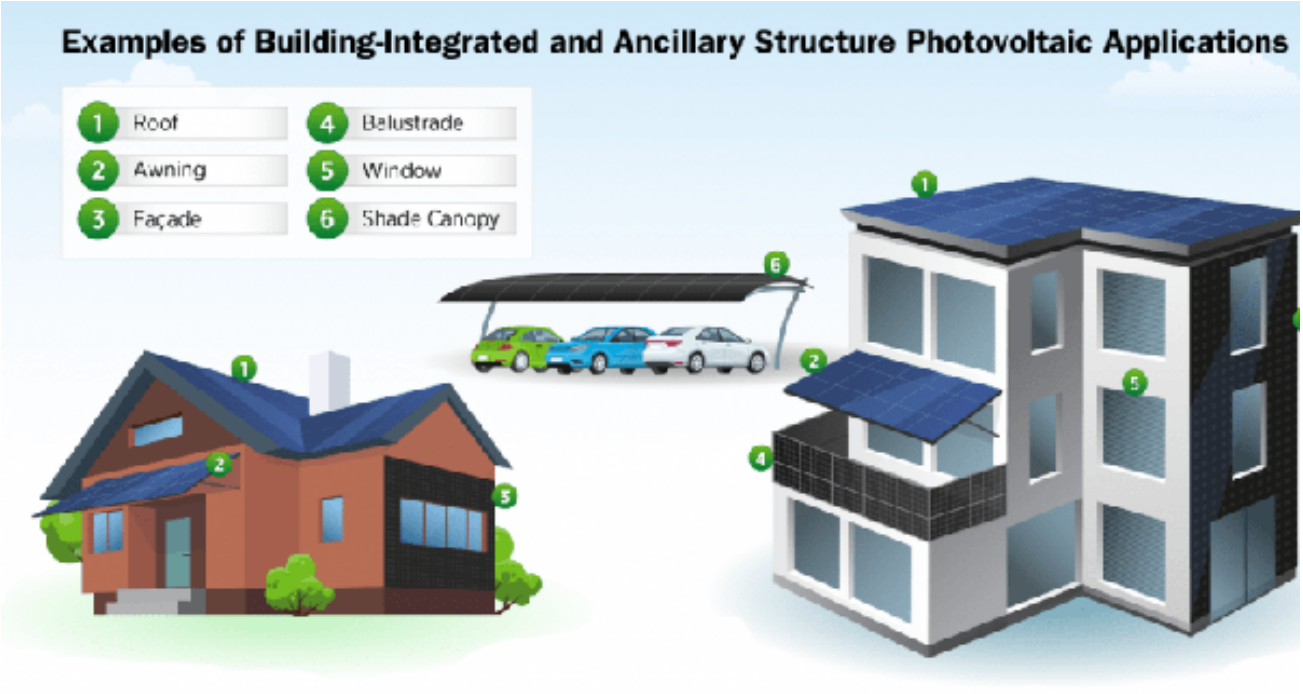
Key Features/Details:

- **Mechanism:** Solar panels integrated into building structures generate electricity.
- **Benefits:** Efficient space use, inclusive solar access, and higher power generation.

- **Challenges:** High costs, policy gaps, and low awareness hinder adoption.
- **Potential:** 309 GW from existing buildings, supporting India's 300 GW solar target.
- **Recommendations:** Expand subsidies, integrate BIPV into building codes, and promote awareness.

Renewable Energy and Urban Development:

- **Urban Relevance:** BIPV suits India's urbanization, addressing space constraints.



- **Policy Recommendations:** Dedicated BIPV subsidies and integration into Smart Cities Mission will drive adoption.
- **Future Directions:** Scaling BIPV with green building standards will support sustainable urban growth
- A new species of jumping spiders from the Spartaeinae subfamily has been discovered in southern India, marking the first record of the genera Spartaeus and Sonoita in the country

NEW JUMPING SPIDER SPECIES DISCOVERED IN SOUTHERN INDIA

Source: *The Hindu (July 14, 2025), The Times of India (July 15, 2025)*

UPSC Connection: Biodiversity, Ecological Significance; Relevant for UPSC Prelims and Mains (GS3 – Environment and Biodiversity).

These spiders are known for their intelligent hunting tactics, keen eyesight, and ecological role as pest controllers.

Comparison:

- Compared to other spider species, jumping spiders are unique for their lack of reliance on webs for hunting, instead using vision and agility, unlike orb-weaver spiders.
- The discovery of Spartaeus and Sonoita in India extends their known range from Southeast Asia and Africa, highlighting India's biodiversity richness compared to other regions.

Overview:

The discovery of a new jumping spider species underscores India's rich biodiversity and the ecological importance of spiders as natural pest controllers. Their unique hunting strategies and silk properties also have potential applications in biotechnology.

Key Features/Details:

- **Species**: Belongs to Spartaeinae subfamily, genera Spartaeus and Sonoita.
- **Characteristics**: Intelligent hunters with keen eyesight; mimic prey to invade other spiders' webs; eight legs, six or eight eyes.
- **Ecological Role**: Carnivorous (except one herbivorous species in Central America); control pest populations; serve as prey for other species.
- **Silk Properties**: Spider silk is used for webs, which act as sensory extensions; has applications in tissue engineering and regenerative medicine.
- **Distribution**: Newly discovered in southern India, previously known from Southeast Asia and Africa.

Broader Implications:

- The discovery highlights the need for continued biodiversity surveys in India, as undiscovered species may hold ecological and economic value.
- Conservation of spider habitats is crucial, as deforestation and urbanization threaten their populations, impacting agricultural ecosystems.

INSECT-BASED LIVESTOCK FEED

Source: *The Hindu (July 12, 2025), The Indian Express (July 13, 2025)*

UPSC Connection: Agriculture, Environment, Sustainability; Relevant for UPSC Prelims and Mains (GS3 – Agriculture, Environment, Science and Technology).

Definition/Detailing:

Insect-based livestock feed involves using insects like black soldier flies, house flies, and crickets as an alternative to traditional livestock feed (e.g., soybean meal, fishmeal). The ICAR-Central Institute of Brackishwater Aquaculture (CIBA) has partnered with Ultra Nutri India Pvt. Ltd. to explore its use in aquaculture, addressing environmental and health concerns associated with conventional feed.

Comparison:

- Compared to traditional livestock feed (e.g., soybean or fishmeal), insect-based feed is more sustainable, requiring less land, water, and emitting fewer greenhouse gases.
- Unlike fishmeal, which depletes marine ecosystems, insect-based feed can utilize organic waste, promoting a circular economy.

Overview:

The shift to insect-based feed is a response to the environmental and health challenges of traditional livestock feed, such as high resource use, greenhouse gas emissions, and antibiotic resistance. With global protein demand projected to rise by 70% by 2050 (FAO), insect-based feed offers a climate-smart solution for sustainable food production.

Key Features/Details:

- **Collaboration**: MoU between ICAR-CIBA and Ultra Nutri India Pvt. Ltd. for aquaculture feed.
- **Insects Used**: Black soldier flies, house flies, compost worms, grasshoppers, mealworms, crickets.

- **Issues with Traditional Feed**: High land and water use, methane emissions, antibiotic residues fostering antimicrobial resistance.
- **Benefits of Insect-Based Feed**:

  Nutritious: Rich in proteins, fats, fibers, and micronutrients (zinc, calcium, iron).

  Low emissions: Reduced greenhouse gas emissions compared to livestock rearing.

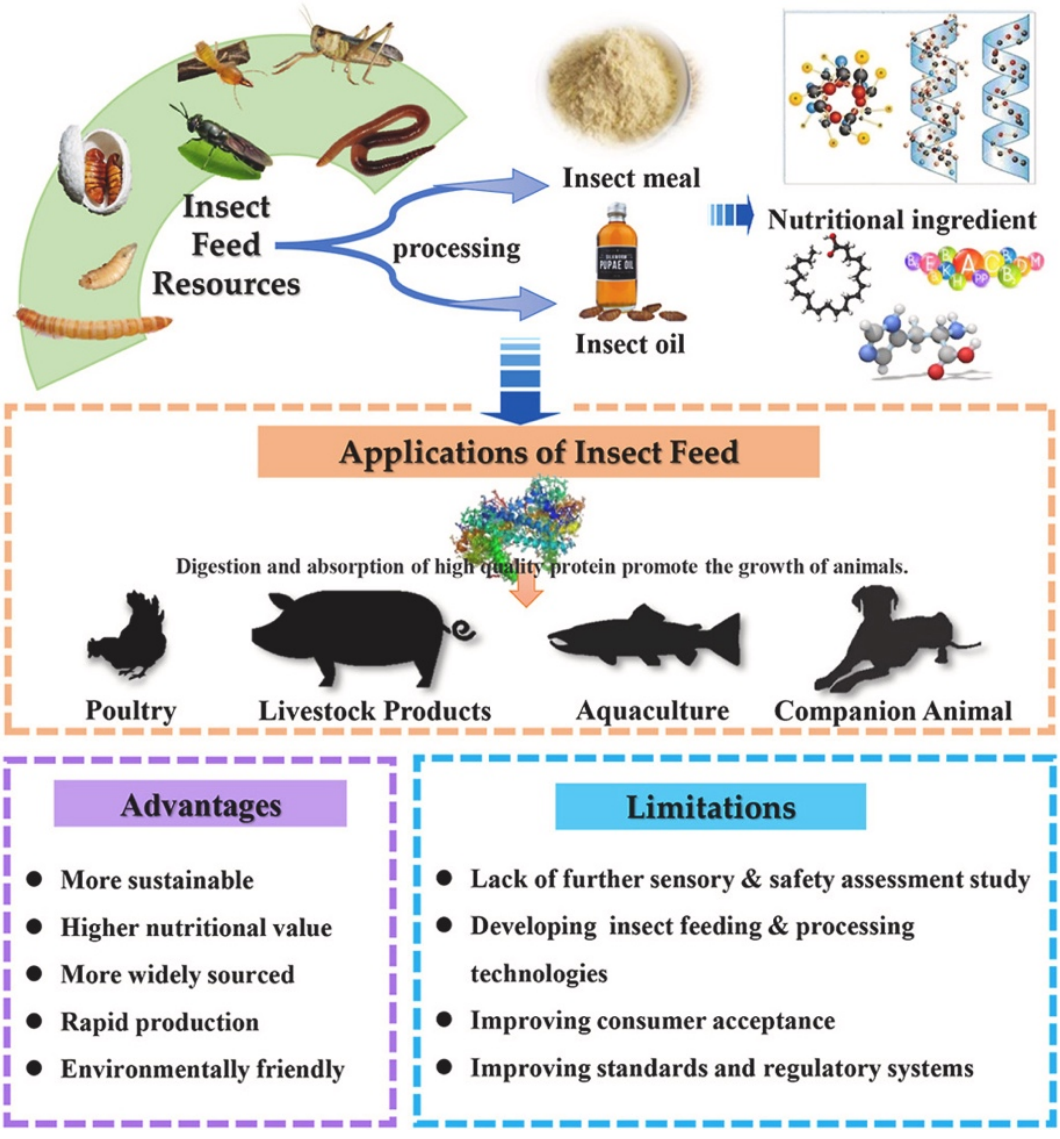
  Resource-efficient: Requires less land and water; uses organic waste as feed.

  High feed efficiency: Crickets need 12 times less feed than cattle for equivalent protein output.

  Global Adoption: 40 countries have approved insect-based feed regulations.

Global and Indian Perspective:

- Globally, insect-based feed is gaining traction as a solution to food security, with countries like the EU and China leading in regulatory frameworks.
- In India, where aquaculture is a growing sector (contributing 8% to agricultural GDP), insect-based feed can enhance productivity while addressing environmental concerns like overfishing and land degradation.



NEW AC TEMPERATURE CONTROL GUIDELINES

Source: *PIB, July 8, 2025; The Times of India, July 9, 2025*

UPSC Connection: Energy Conservation, Public Health; Relevant for UPSC Prelims and Mains (GS Paper III – Environment, GS Paper II – Governance)

Definition/Detailing:

The Union Ministry of Power plans to mandate a 20°C–28°C temperature range for air conditioners to reduce energy consumption and mitigate health risks. The move addresses India's projected 200 GW AC load by 2030 and health issues linked to excessive cooling.

Comparison:

- **India vs. Global Practices:** Japan's Cool Biz campaign promotes higher AC temperatures, similar to India's proposal.
- **Current vs. Proposed Guidelines:** Existing ACs allow temperatures as low as 16°C, while the new range prioritizes efficiency and health.

Overview:

The proposed guidelines cap AC temperatures between 20°C and 28°C, aiming to save 20 billion units of electricity annually and reduce health risks like hypertension and respiratory issues associated with low temperatures.

Key Features/Details:

- **Temperature Range:** 20°C–28°C for all new ACs in homes and commercial settings.
- **Energy Savings:** Each 1°C increase saves 6% electricity; a 24°C setting could save 20 billion units/year.
- **Health Benefits:** Reduces risks of hypertension, asthma, and mental health issues.
- **Rationale:** Address rising AC load (200 GW by 2030) and public health concerns.
- **WHO Guidelines:** Recommends 18°C as the minimum safe indoor temperature.

Energy Conservation and Public Health:

- **Energy Demand:** Rising AC use strains India's grid, necessitating demand-side management.
- **Policy Recommendations:** Incentives for energy-efficient ACs and public campaigns will enhance adoption.
- **Future Directions:** Integrating AC guidelines with smart grid technologies will ensure sustainability.

CHENAB BRIDGE – WORLD'S HIGHEST RAILWAY ARCH BRIDGE

Source: *The Hindu (July 10, 2025), Indian Express (July 12, 2025)*

UPSC Connection: Infrastructure Development, National Security, Economic Development; Relevant for UPSC Prelims and Mains (GS3 – Infrastructure, Economic Development, Security).

Definition/Detailing:

The Chenab Bridge, located in the Reasi district of Jammu and Kashmir, is the world's highest railway arch bridge, standing above the Chenab River. It forms a critical component of the Udhampur-Srinagar-Baramulla Rail Link (USBRL) project, which aims to integrate Jammu and Kashmir with India's railway network. With a total length of 1,315 meters, including a 467-meter arch, the bridge is engineered to withstand extreme

conditions, supporting train speeds of up to 100 km/h and boasting a lifespan of 120 years.

- **Location**: Reasi district, Jammu and Kashmir, spanning the Chenab River.

Comparison:

- Compared to other iconic railway bridges globally, such as the Beipan River Bridge in China (world's highest cable-stayed railway bridge), the Chenab Bridge stands out for its arch design and strategic location in a geopolitically sensitive region.
- Unlike the Beipan Bridge, which primarily serves high-speed rail, the Chenab Bridge focuses on connectivity and security in a challenging terrain.

Overview:

The Chenab Bridge is a landmark infrastructure project by Indian Railways, symbolizing engineering excellence and strategic importance. It connects remote areas of Jammu and Kashmir, enhancing accessibility and fostering economic and social integration with mainland India.

Key Features/Details:

- **Specifications**: 1,315 meters long, with a 467-meter arch; designed for 100 km/h train speeds; 120-year lifespan.
- **Project**: Part of the 272-km USBRL project to connect Udhampur, Srinagar, and Baramulla.
- **Construction**: Built by Indian Railways, designed to withstand seismic activity and harsh weather conditions.

Strategic and Geopolitical Significance:

- The bridge strengthens India's strategic presence in Jammu and Kashmir, a region with ongoing security concerns due to its proximity to Pakistan and China.
- It enhances India's ability to respond to potential conflicts by ensuring rapid deployment of resources, aligning with national security policies.

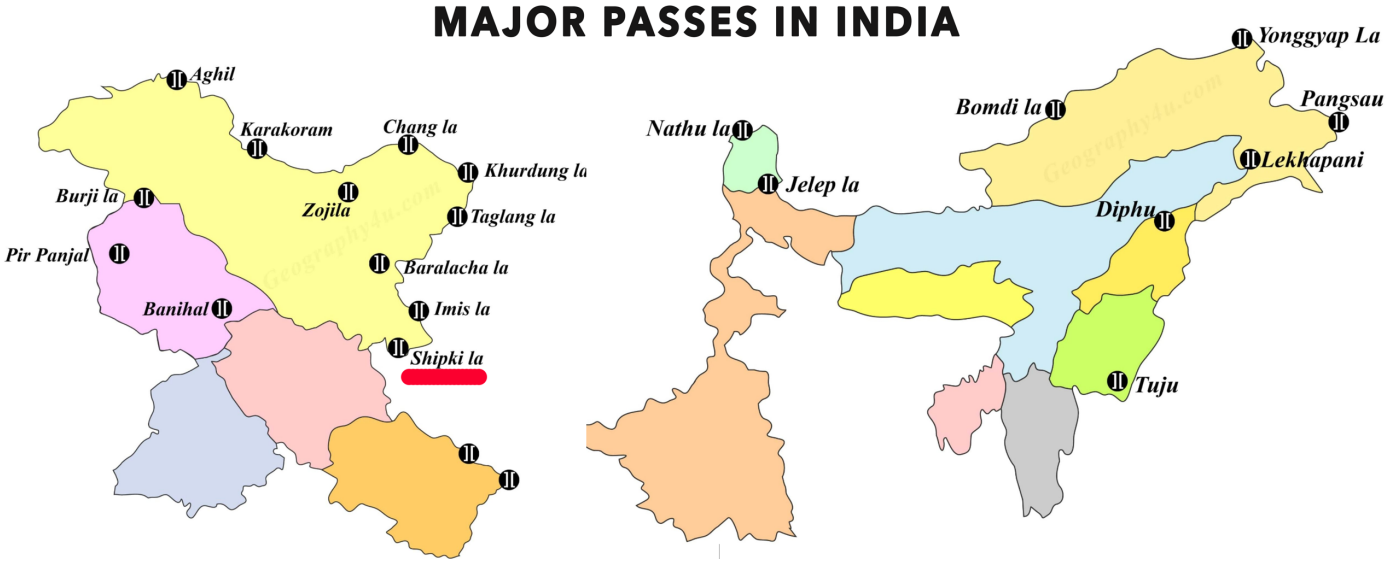
SHIPKI LA REOPENED FOR TOURISM

Source: *The Times of India (July 8, 2025), Hindustan Times (July 9, 2025)*

UPSC Connection: Physical Geography, Tourism, Border Area Development; Relevant for UPSC Prelims and Mains (GS1 – Geography, GS3 – Economic Development).

Overview:

The reopening of Shipki La for tourism is a strategic move to boost the local economy and promote cultural vibrancy in Himachal Pradesh's border areas. It covers locations like Lepcha-La, Gue Monastery, and Chitkul, offering tourists access to unique landscapes and cultural heritage.



Definition/Detailing:

Shipki La, a high-altitude motorable mountain pass at 3,930 meters in Kinnaur district, Himachal Pradesh, marks the border between India and China. For the first time, it has been opened to tourists, requiring only an Aadhar card and a token for access. This initiative is part of a broader border tourism strategy to promote economic and cultural activities in strategically significant areas.

Comparison:

- Compared to other border tourism initiatives, such as those in Ladakh (e.g., Pangong Lake), Shipki La's opening is unique due to its proximity to the India-China border and its high-altitude location.
- Unlike Ladakh's tourism, which is more established, Shipki La's tourism is in its nascent stage, focusing on regulated access to preserve security and ecological balance.

Key Features/Details:

- **Location**: Kinnaur district, Himachal Pradesh, at 3,930 meters, bordering China.
- **Access**: Tourists require an Aadhar card and a token; regulated to ensure security.
- **Areas Covered**: Includes Lepcha-La, Shipki-La, Gue Monastery, Khana, Dumti, Rani area of Sangla, Chitkul, and select areas in Lahaul-Spiti.
- **Objective**: Promote tourism, stimulate the local economy, and highlight cultural heritage.

Geopolitical Implications:

- Opening Shipki La for tourism signals India's confidence in managing border areas while promoting economic activity, potentially

countering China's infrastructure development in Tibet.

- Regulated access ensures security, reflecting a balanced approach to tourism in a geopolitically sensitive region.

KING COBRA REINTRODUCTION IN MADHYA PRADESH

Source: *The Indian Express (July 11, 2025), The Hindu (July 13, 2025)*

UPSC Connection: Biodiversity, Conservation, Environmental Issues; Relevant for UPSC Prelims and Mains (GS3 – Environment and Biodiversity).

Definition/Detailing:

The King Cobra, the world's longest venomous snake, is being considered for reintroduction in Madhya Pradesh to address rising snakebite deaths. Known for its unique nest-building behavior and preference for humid, forested habitats, the species faces threats from deforestation and habitat encroachment. Genetic studies reveal four distinct lineages, necessitating careful reintroduction to avoid ecological disruption.

Comparison:

- Compared to other snake species like the Indian Cobra, the King Cobra's unique nest-building and solitary nature make it less adaptable to human-dominated landscapes.
- Unlike the Indian Cobra, which is widespread, the King Cobra's specific habitat requirements limit its reintroduction feasibility in central India's dry deciduous forests.

Overview:

The initiative to reintroduce King Cobras in Madhya Pradesh aims to control snakebite incidents by leveraging the species' predatory nature. However, ecological and genetic considerations are critical to ensure conservation success without disrupting local ecosystems.

Key Features/Details:

- **Characteristics**: World's longest venomous snake, growing up to 15 feet; builds nests for eggs; avoids human habitations.
- **Distribution in India**: Western Ghats, North Indian terai, Northeast India, West Bengal, Odisha, Andaman and Nicobar, Eastern Ghats.
- **Habitats**: Humid forests, swamps, bamboo patches; not historically recorded in central India's dry deciduous forests.
- **Threats**: Deforestation, urban expansion, hunting for skin and meat.
- **Conservation Status**: IUCN – Vulnerable; CITES – Appendix II; Wildlife Protection Act, 1972 – Schedule II; India's national reptile.
- **Lineages**: Four distinct genetic lineages (Western Ghats, Asian Mainland, Malay Peninsula, Greater Sunda and Philippines).

Public Health and Conservation Link:

- Snakebites are a neglected tropical disease in India, necessitating integrated approaches combining conservation, medical infrastructure, and community education.
- The initiative reflects a novel but risky strategy, as King Cobras may not effectively reduce snakebite incidents if habitat mismatch occurs.

KAZIRANGA NATIONAL PARK AND TIGER RESERVE EXPANSION

Source: *The Indian Express (July 14, 2025), The Hindu (July 15, 2025)*

UPSC Connection: Biodiversity, Conservation; Relevant for UPSC Prelims and Mains (GS3 – Environment).

Definition/Detailing:

The Assam Cabinet has approved the expansion of Kaziranga National Park and Tiger Reserve from 1,302 sq. km to 1,775 sq. km. A UNESCO World Heritage Site, Kaziranga is home to 2,613 one-horned rhinos and diverse fauna, bordered by the Brahmaputra River.

Comparison:

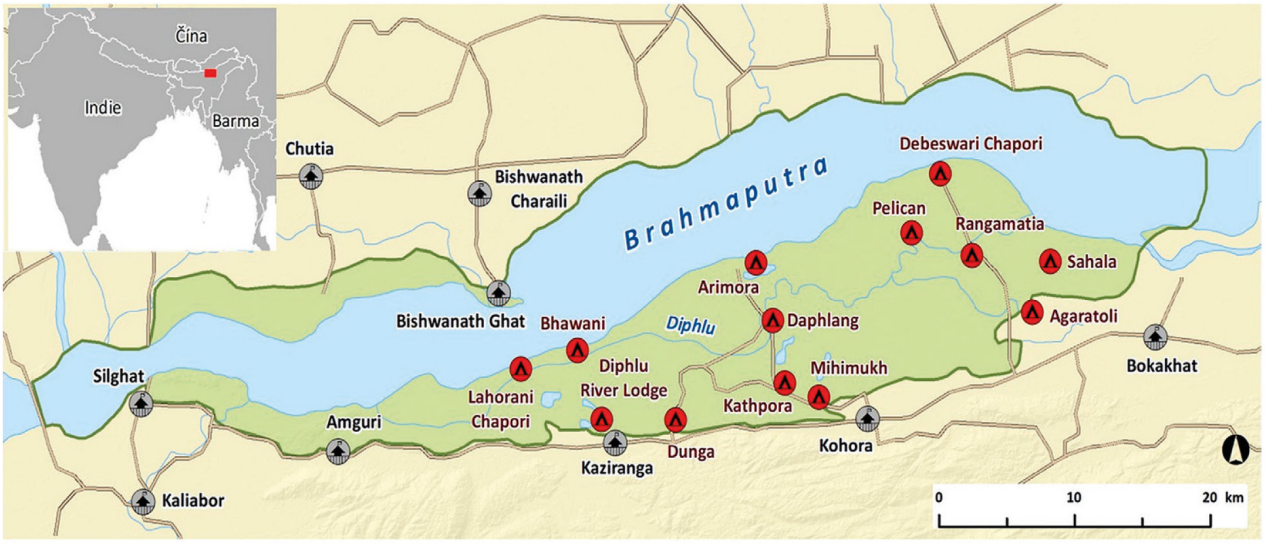
- Compared to other tiger reserves like Sundarbans, Kaziranga's expansion focuses on protecting a unique rhino population alongside tigers.

Key Features/Details:

- **Location**: Assam; bordered by Brahmaputra, Mora Diphlu, and Diphlu rivers.
- **Area**: Current: 1,302 sq. km; Proposed: 1,775 sq. km.
- **Biodiversity**: 2,613 one-horned rhinos, tigers, leopards, elephants, wild water buffalo, swamp deer, sloth bears, hoolock gibbons.
- **Status**: UNESCO World Heritage Site.

Conservation Impact:

- The expansion strengthens India's conservation efforts, ensuring the survival of the one-horned rhino, a flagship species, and supporting global biodiversity goals.



Kaziranga NP: Map showing the delimitation of the borders after the sixth and largest extension of the park to include the riverbed of the Brahmaputra, which consists of sandy sediments for part of the year. Compiled by Jan Vrba

- Unlike smaller sanctuaries, Kaziranga's large area supports a diverse ecosystem, making expansion critical for habitat connectivity.

Overview:

The expansion of Kaziranga enhances conservation efforts for its iconic one-horned rhinos and other species, reinforcing its role as a global biodiversity hotspot.

AIR POLLUTION AND PREMATURE BIRTH

Source: *The Times of India (July 13, 2025), Hindustan Times (July 14, 2025)*

UPSC Connection: Environment, Public Health; Relevant for UPSC Prelims and Mains (GS3 – Environment, Health).

Definition/Detailing:

A US study has provided molecular evidence linking air pollution (PM2.5, nitrogen dioxide, sulfur dioxide) exposure during pregnancy to increased risks of preterm birth, low birth weight, and developmental issues. Pollutants disrupt biological molecules like cortexolone and lysoPE(20:3), affecting fetal development.

Comparison:

- Compared to other environmental health risks (e.g., water contamination), air pollution's impact on pregnancy outcomes is more insidious due to its ability to cross the placental barrier.
- Unlike occupational hazards, air pollution affects a broader population, particularly in urban areas with poor air quality.

Overview:

Air pollution's link to premature births highlights the intersection of environmental degradation and public health, emphasizing the need for stringent pollution control measures to protect vulnerable populations like pregnant women.

Key Features/Details:

- **Study Findings**: PM2.5, nitrogen dioxide, and sulfur dioxide increase risks of preterm birth, low birth weight, and developmental issues.
- **Mechanism**: Pollutants disrupt cortexolone and lysoPE(20:3), affecting protein digestion and absorption critical for fetal growth.
- **Impact**: Pollutants penetrate the placental barrier, directly affecting fetal development.

Public Health Implications:

- Air pollution's impact on maternal health underscores the need for integrated policies combining environmental protection (e.g., NCAP) with healthcare initiatives like the Pradhan Mantri Surakshit Matritva Abhiyan.

INDIA'S FIRST INTEGRATED E-WASTE ECO PARK

Source: *The Hindu (July 11, 2025), The Indian Express (July 12, 2025)*

UPSC Connection: Waste Management, Environment; Relevant for UPSC Prelims and Mains (GS3 – Environment, Economic Development).

Definition/Detailing:

Delhi's planned integrated E-Waste Eco Park in Holambi Kalan, built under a Public-Private Partnership (PPP) model, aims to process 51,000 metric tonnes of e-waste annually. It will include recycling, dismantling, refurbishing, and training zones to formalize e-waste management.

Comparison:

- Compared to informal e-waste recycling (80% of India's e-waste sector), the Eco Park offers a scientific, regulated approach, reducing health and environmental risks.
- Unlike China's Guiyu e-waste hub, which faces severe pollution issues, Delhi's Eco Park emphasizes sustainability and green jobs.

Overview:

The E-Waste Eco Park addresses India's e-waste crisis (1.7 million tonnes in FY24) by promoting scientific recycling, resource recovery, and skill development, positioning Delhi as a leader in sustainable waste management.

Key Features/Details:

- **Location**: Holambi Kalan, northwest Delhi; 11.4 acres.

- **Capacity**: 51,000 metric tonnes annually.
- **Features**: Zones for dismantling, refurbishing, component testing, plastic recovery, second-hand electronics market, and training centers.
- **Context**: India is the third-largest e-waste producer globally; Delhi contributes 9.5% of India's e-waste; only 43% is recycled, with 80% handled informally.
- **Health Risks**: Toxins from crude e-waste handling contaminate air, soil, and water, affecting vulnerable groups.

Circular Economy Potential:

- The Eco Park can serve as a model for other Indian cities, promoting sustainable waste management and reducing the environmental footprint of electronic consumption.

FLASH FLOOD IN SUBARNAREKHA RIVER

Source: *The Indian Express (July 13, 2025), Hindustan Times (July 14, 2025)*

UPSC Connection: Physical Geography, Disaster Management; Relevant for UPSC Prelims and Mains (GS1 – Geography, GS3 – Disaster Management).

Definition/Detailing:

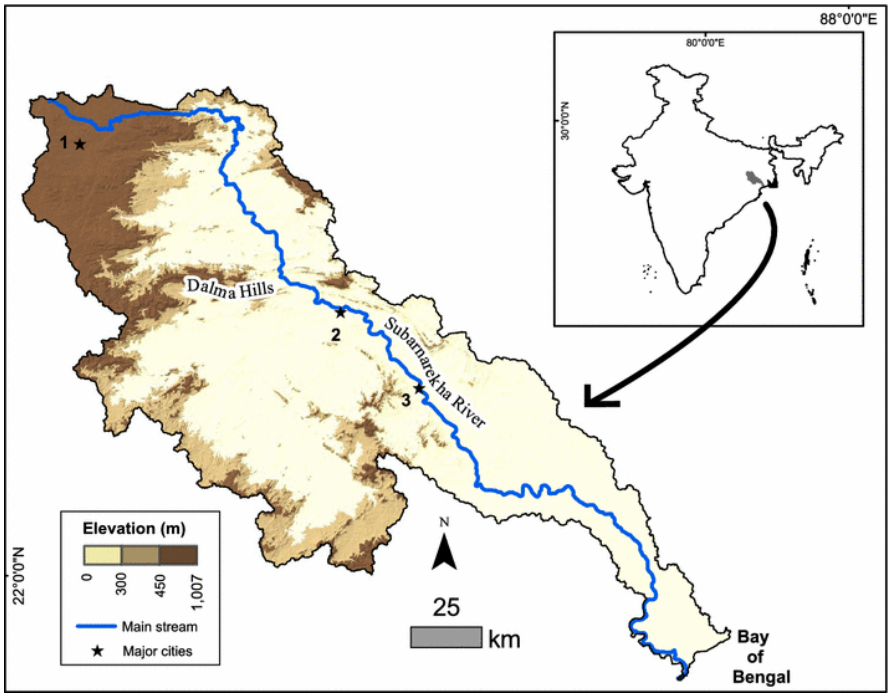
Subarnarekha River, a rain-fed river originating in Jharkhand's Chhotanagpur plateau, recently caused flash floods in Odisha's Balasore district, affecting over 50,000 people. Pollution from copper and uranium mining threatens its role as a lifeline for tribal communities.

Comparison:

- Compared to other rain-fed rivers like the Godavari, the Subarnarekha's smaller length (395 km) makes it more prone to flash floods due to concentrated rainfall.
- Unlike perennial rivers its rain-fed nature increases flood risk during monsoons.

Overview:

Subarnarekha flood highlights the vulnerability of rain-fed river systems to extreme weather events, exacerbated by climate change, and the environmental challenges posed by mining-related pollution.



Key Features/Details:

- **Location**: Originates near Ranchi, flows through Jharkhand, West Bengal, Odisha; drains into Bay of Bengal.
- **Length**: 395 km; tributaries include Kanchi and Karkari rivers.
- **Flood Impact**: Affected over 50,000 people in Balasore, Odisha.
- **Pollution**: Contaminated by copper and uranium mining, impacting tribal livelihoods.

Disaster Management Strategies:

- Effective flood management requires real-time monitoring, community-based preparedness, and restoration of river ecosystems to mitigate mining-related pollution.

INDIA'S FIRST BUTTERFLY SANCTUARY

Source: *The Hindu (July 12, 2025), The Times of India (July 13, 2025)*

UPSC Connection: Biodiversity, Conservation; Relevant for UPSC Prelims and Mains (GS3 – Environment).

Definition/Detailing:

The Aralam Wildlife Sanctuary in Kerala's Kannur district has been renamed the Aralam Butterfly Sanctuary, India's first dedicated butterfly habitat. Spanning 55 sq. km, it hosts 266 butterfly species, including rare and endangered ones, alongside other fauna.

Comparison:

- Compared to other sanctuaries like Silent Valley, Aralam's focus on butterflies is unique, emphasizing micro-biodiversity conservation.
- Unlike bird sanctuaries, butterfly sanctuaries require specific habitat management to support pollination and plant diversity.

Overview:

The establishment of India's first butterfly sanctuary underscores the importance of conserving lesser-known species like butterflies, which play a critical role in pollination and ecosystem health.

Key Features/Details:

- **Location**: Kannur, Kerala, in the Western Ghats; 55 sq. km.
- **Biodiversity**: 266 butterfly species, including rare/endangered ones; also hosts squirrels, elephants, leopards, birds.
- **National Butterfly**: Orange Oakleaf, found in Central, Northern, and Northeastern India.
- **Significance:** First sanctuary dedicated to butterflies, promoting pollination and biodiversity.

Conservation Significance:

- Protecting butterflies supports ecosystem services like pollination, critical for India's agricultural economy, which relies on pollinators for 70% of crops.

WORLD'S LARGEST WASTE PROCESSING PLANT IN CHENNAI

Source: *The Times of India (July 14, 2025), The Hindu (July 15, 2025)*

UPSC Connection: Waste Management, Environment, Clean Energy; Relevant for UPSC Prelims and Mains (GS3 – Environment, Energy).

Definition/Detailing:

Singapore-based Blue Planet Environmental Solutions is developing the world's largest waste processing plant at Kodungaiyur, Chennai, to address 66 lakh cubic meters of accumulated garbage. The plant will use bio-mining and convert agricultural waste into compressed biogas (CBG), promoting a zero-residue model.

Comparison:

- Compared to Delhi's E-Waste Eco Park, Chennai's plant focuses on municipal and agricultural waste, with a broader scope including bio-mining and clean energy production.
- Unlike traditional landfills, the zero-residue model ensures complete waste utilization, setting it apart from conventional waste management systems.

Overview:

The Kodungaiyur waste processing plant aims to mitigate environmental and health hazards from accumulated garbage while promoting clean energy through CBG production, aligning with sustainable waste management and renewable energy goals.

Key Features/Details:

- **Location**: Kodungaiyur, North Chennai, Tamil Nadu.
- **Objective**: Process 66 lakh cubic meters of garbage via bio-mining; convert agricultural waste (e.g., paddy stubble) into CBG.
- **Collaboration**: Blue Planet Environmental Solutions and Greater Chennai Corporation.
- **Model**: Zero-residue model for 100% scientific waste utilization.
- **Benefits**: Improves public health, reduces environmental pollution, and supports clean energy.

Environmental and Health Benefits:

- The project mitigates air pollution from stubble burning, a major issue in northern India, and reduces landfill-related contamination, improving urban livability.

INTERNATIONAL RELATIONS and INTERNAL SECURITY

REVIEW OF INDIA-ASEAN AITIGA

Source: *Ministry of Commerce, June 2025; The Economic Times, June 2025*

UPSC Connection: Regional Groupings, Trade; Relevant for UPSC Prelims and Mains (GS Paper 2 – International Relations; GS Paper 3 – Economy)

Overview:

The **ASEAN-India Trade in Goods Agreement (AITIGA)**, signed in 2009, is under review due to its underutilization (<50% by Indian exporters) and India's widening trade deficit with ASEAN ($45.2 billion in FY25). The government is addressing procedural and awareness gaps to enhance trade efficiency.

Definition/Detailing:

- **AITIGA**: A free trade agreement between India and 10 ASEAN countries, implemented in 2010, to reduce tariffs and enhance market access for goods.
- **Trade Deficit**: India's exports to ASEAN declined to $38.96 billion, while imports rose to $84.16 billion in FY25, highlighting underutilization of FTA benefits.

Comparison:

- **AITIGA vs. India-EU FTA**: AITIGA focuses on goods, while EU negotiations include services and investments, offering broader scope.
- **India vs. ASEAN Peers**: ASEAN countries leverage FTAs more effectively due to better awareness and simpler RoO compliance.

Key Features/Details:

- **AITIGA Framework**:
- Covers tariff reductions on 80% of goods, with sensitive and exclusion lists.
- Requires 35% value addition for Rules of Origin (RoO).
- Includes safeguard mechanisms and dispute resolution.
- **Challenges:**
- **Underutilization**: <50% of exporters use FTA benefits, paying regular duties.
- **Complex RoO**: Difficulty in meeting origin criteria and obtaining Certificates of Origin (COO).
- **Procedural Delays**: Slow COO issuance and customs clearance issues.
- **Awareness Gap**: Small exporters lack knowledge of AITIGA benefits.
- **Government Review**:
- Seeks industry inputs on RoO, documentation costs, and customs issues.

Challenges and Implications:

- **Trade Deficit**: Widening deficit strains India's balance of payments.
- **Competitiveness**: Indian exporters face challenges against ASEAN's efficient supply chains.
- **Geopolitical Role**: Underutilized FTAs weaken India's regional influence.

Way Forward:

- Simplify RoO and COO processes for exporters.
- Launch awareness campaigns for MSMEs.
- Strengthen dispute resolution mechanisms in AITIGA.

DISMAL STATE OF SOUTH ASIAN ECONOMIC INTEGRATION

Source: *UNESCAP Report, June 2025; The Economic Times, June 2025*

UPSC Connection: Regional Groupings, India's Neighborhood; Relevant for UPSC Prelims and Mains (GS Paper 2 – International Relations; GS Paper 3 – Economy)

Overview:

South Asia, despite hosting 25% of the global population, remains one of the least economically integrated regions, with intra-regional trade at 5–7% of total trade. The **South Asian Free Trade Area (SAFTA)** under SAARC has underperformed due to high trade costs, trust deficits, and regional conflicts.

Definition/Detailing:

- **SAFTA**: A 2004 agreement under SAARC to promote intra-regional trade through tariff reductions and cooperation.
- **Intra-Regional Trade**: Only $23 billion compared to a potential $67 billion, with 86% unexploited potential (UNESCAP).

Comparison:

- **South Asia vs. EU/ASEAN**: EU (45%) and ASEAN (22%) have significantly higher intra-regional trade than SAARC (5–7%).
- **India vs. Bangladesh**: Bangladesh has the highest unexploited trade potential (93%), while India drives regional trade but faces barriers with Pakistan.

Key Features/Details:

- **Economic Disparity**:

  South Asia's GDP ($5 trillion) lags behind EU ($18 trillion) and NAFTA ($24.8 trillion).

- **Barriers**:

  High Trade Costs: Intra-regional trade costs 114% of goods' value, compared to 76% for ASEAN.

  Underperforming SAFTA: Limited implementation due to trust deficits and conflicts.

  Security Issues: India-Pakistan trade fell from $2.4 billion (2018) to $1.2 billion (2024) due to border disputes and terrorism.

  Lack of Vision: Irregular SAARC summits hinder long-term planning.

- **Impacts**:

  Reduced trade-to-GDP ratio (42.94% in 2024).

  Widened trade deficit ($339 billion in 2022).

  Softened growth forecast (5.8% in 2025, per World Bank).

Challenges and Implications:

- **Political Tensions**: India-Pakistan rivalry hinders SAFTA's potential.
- **Infrastructure Gaps**: Poor connectivity increases trade costs.
- **Trust Deficit**: Regional forums lack enforcement mechanisms.

Way Forward:

- Prioritize SAFTA implementation through tariff reductions.
- Resolve bilateral disputes via dialogue and confidence-building measures.
- Invest in regional connectivity (e.g., BBIN corridor).

INDIA'S UNEASY BALANCING ACT IN THE BAY OF BENGAL

Source: *Ministry of External Affairs, June 2025; The Hindu, June 2025*

UPSC Connection: India's Neighborhood, Regional Integration; Relevant for UPSC Prelims and Mains (GS Paper 2 – International Relations)

Overview:

India is positioning itself as a regional integrator in the **Bay of Bengal** through infrastructure (Sagarmala), policy reforms, and BIMSTEC initiatives. However, actions like withdrawing Bangladesh's transshipment facility raise concerns about India's credibility as a cooperative trade facilitator.

Definition/Detailing:

- **Bay of Bengal**: A strategic region connecting South and Southeast Asia, critical for trade and connectivity.
- **BIMSTEC**: A regional organization fostering economic and technical cooperation among Bay of Bengal countries.

Comparison:

- **India vs. China**: India's regional leadership competes with China's Belt and Road Initiative in the Bay of Bengal.
- **BIMSTEC vs. SAARC**: BIMSTEC is more functional due to fewer political tensions compared to SAARC.

Key Features/Details:

- **India's Initiatives**:

  Sagarmala Programme: Enhances port infrastructure and coastal logistics.

  Policy Reforms: GST cuts on bunker fuel and coastal shipping incentives doubled east coast cargo movement.

  BIMSTEC: Signed Maritime Transport Cooperation Agreement for harmonized customs and connectivity.

- **Concerns**:

  Withdrawal of Bangladesh's transshipment facility citing misuse, raising trust issues.

  Restrictions on Bangladeshi imports via land routes signal political displeasure.

- **Implications**:

  Risks eroding trust among BIMSTEC members (e.g., Nepal, Bhutan).

  Smaller nations may turn to China or Southeast Asia for trade.

Challenges and Implications:

- **Trust Deficit**: Political signaling through trade restrictions undermines regional cooperation.
- **China's Influence**: Smaller nations may pivot to China if India falters.
- **Leadership**: Predictable, rule-based behavior is critical for India's credibility.

Way Forward:

- Establish transparent trade rules via BIMSTEC.
- Clarify reasons for trade restrictions to rebuild trust.
- Enhance regional connectivity through Sagarmala and BBIN.

INDIA-EUROPE RELATIONS IN A SHIFTING WORLD ORDER

Source: *Ministry of External Affairs, June 2025; The Hindu, June 2025*

UPSC Connection: Bilateral Relations, Geopolitics; Relevant for UPSC Prelims and Mains (GS Paper 2 – International Relations)

Overview:

India is deepening strategic ties with Europe to support a multipolar world order, driven

by high-level engagements like the Prime Minister's G7 Summit visit (2025) and bilateral trips to Croatia and Cyprus. Europe's strategic autonomy aligns with India's vision, fostering cooperation in trade, defense, and technology.

Definition/Detailing:

- **India-Europe Relations**: Encompass trade, defense, technology, and connectivity partnerships, strengthened by shared democratic values and multipolarity goals.
- **Multipolar World**: A global order with multiple power centers (e.g., U.S., China, EU, India), reducing reliance on a single hegemon.

Comparison:

- **India-Europe vs. India-U.S.**: Europe offers a balanced partnership, less influenced by U.S.-China rivalry, unlike India's strategic alignment with the U.S.
- **Pre- vs. Post-Ukraine War**: Europe's post-war focus on security autonomy has opened new avenues for India, unlike earlier trade-centric ties.

Key Features/Details:

- **Strategic Shifts**:

  Trump-Era Volatility: U.S.'s "America First" policy and NATO uncertainties push India toward Europe.

  Europe as a Swing State: Europe's neutrality in U.S.-China rivalry aligns with India's non-alignment.

  Security Realignments: Post-Ukraine war, Europe's increased defense spending (e.g., €800 billion ReArm 2030) creates opportunities for India.

- **Engagements**:

  G7 Summit 2025: India's participation strengthens ties with the Western bloc on climate, digital governance, and resilience.

  EU-India TTC (2023): Advances cooperation in AI, quantum computing, and green technologies.

  IMEC: Connects India, Middle East, and Europe, reducing China dependency.

  Defense: Joint exercises with France and co-development talks.

- **Challenges:**

  India's defense ties with Russia strain EU relations due to the Ukraine conflict.

Challenges and Implications:

- **Russia Factor**: Balancing ties with Russia and Europe is diplomatically challenging.
- **Trade Barriers**: Non-tariff barriers in EU markets hinder Indian exports.
- **Strategic Trust**: Building consistent engagement is key to long-term partnerships.

Way Forward:

- Accelerate India-EU FTA negotiations for deeper economic ties.
- Expand defense and tech collaborations through joint R&D.
- Clarify India's stance on Russia to align with European priorities.

INDIA-CROATIA TO STRENGTHEN BILATERAL TIES

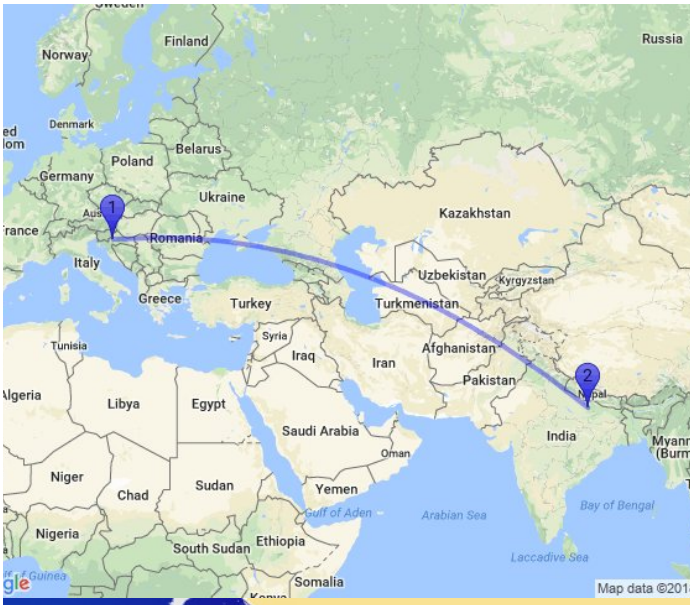
Source: *Ministry of External Affairs, June 2025; The Hindu, June 2025*

UPSC Connection: Bilateral Relations, Connectivity; Relevant for UPSC Prelims and Mains (GS Paper 2 – International Relations)

Overview:

The Indian Prime Minister's visit to Croatia in 2025, involving talks with the Croatian Prime

Minister, aims to enhance bilateral ties in defense, space, infrastructure, and digital sectors. Croatia's Adriatic location positions it as a gateway to Central and Southeastern Europe.



Definition/Detailing:

- **India-Croatia Relations**: Rooted in historical ties, focusing on defense, technology, and connectivity.
- **Sagarmala Project**: A flagship initiative to modernize India's ports, inviting Croatian participation.

Comparison:

- **India-Croatia vs. India-Cyprus**: Both visits counter Turkey's influence, but Croatia focuses on Central Europe, while Cyprus targets the Mediterranean.
- **Croatia vs. Other EU Nations**: Croatia's Adriatic ports complement IMEC's European leg, unlike landlocked EU states.

Key Features/Details:

- **Defense Cooperation**:
- Plans for defense production, training, and military exchanges.
- **Space Collaboration**:
- Joint ventures in space technology, leveraging India's ISRO expertise.
- **Economic Ties**:
- Targets Croatian investment in India's pharmaceuticals, IT, and clean technology.
- Invites Croatian firms for Sagarmala's port modernization and shipbuilding.
- **Connectivity**:
- Croatia as a gateway to Central and Southeastern Europe, complementing IMEC.

Challenges and Implications:

- **Trade Scale**: India-Croatia trade is limited, requiring sustained investment.
- **Geopolitical Balancing**: Navigating Croatia's EU commitments and India's non-alignment.
- **IMEC Integration**: Croatia's role needs formal inclusion in IMEC.

Way Forward:

- Expand trade through joint ventures in high-tech sectors.
- Formalize Croatia's role in IMEC for connectivity.
- Strengthen cultural exchanges via diaspora engagement.

INDIA SUPPORTS CYPRUS'S SOVEREIGNTY

Source: *Ministry of External Affairs, June 2025; The Indian Express, June 2025*

UPSC Connection: Bilateral Relations, Geopolitics; Relevant for UPSC Prelims and Mains (GS Paper 2 – International Relations)

Overview:

The Indian Prime Minister's visit to Cyprus in 2025, the first in over 20 years, signals support for Cyprus's territorial integrity amid its conflict with Turkey. The visit strengthens India's ties with Cyprus, a key player in the **India-Middle East-Europe Economic Corridor (IMEC)**, and counters Turkey's alignment with Pakistan.

Definition/Detailing:

- **Cyprus Issue**: The island is divided into the Republic of Cyprus (EU member, internationally recognized) and the Turkish Republic of Northern Cyprus (TRNC, recognized only by Turkey), following a 1974 Turkish invasion.
- **India-Cyprus Ties**: Rooted in shared democratic values, with cooperation in trade, security, and IMEC.

Comparison:

- **India-Cyprus vs. India-Turkey**: India's support for Cyprus counters Turkey's backing of Pakistan, reflecting strategic alignments.
- **Cyprus vs. Other EU Nations**: Cyprus's strategic Mediterranean location and upcoming EU Presidency (2026) make it uniquely important for India.

Key Features/Details:

- **India's Stance**:

  Backs Cyprus's sovereignty under UNSC resolutions and international law.

  Supports Cyprus's role in IMEC and India's UNSC permanent seat bid.

- **Cyprus's Support**:

  Endorses India's UNSC candidacy and India-U.S. Civil Nuclear Agreement in NSG and IAEA.

- **Strategic Importance**:

  Cyprus's Mediterranean location enhances IMEC's trade connectivity.

Counters Turkey's anti-India stance in Pakistan-occupied Kashmir.

- **People-to-People Ties**:

  The Indian diaspora in Cyprus strengthens soft power.

Challenges and Implications:

- **Turkey Tensions**: Supporting Cyprus may strain India-Turkey trade ($5.72 billion exports).
- **Balancing Act**: India must navigate EU and Turkey relations carefully.
- **IMEC Success**: Cyprus's role is critical for IMEC's viability.

Way Forward:

- Deepen trade and defense ties with Cyprus.
- Engage Turkey diplomatically to avoid trade disruptions.
- Leverage Cyprus's EU Presidency for India-EU FTA talks.

OPERATION SPIDER'S WEB: FIRST PERSON VIEW DRONES

Source: *International Security Reports, June 2025; The Hindu, June 2025*

UPSC Connection: Internal Security, Emerging Threats; Relevant for UPSC Prelims and Mains (GS Paper 3 – Security, Technology)

Overview:

Ukraine's **Operation Spider's Web** demonstrated the transformative potential of **First Person View (FPV)** drones, striking Russian air bases with precision. This marks a shift in modern warfare, highlighting the need for India to invest in drone and anti-drone technologies.

Definition/Detailing:

- **FPV Drones**: Small, agile drones with real-time video feeds, enabling precise strikes at low cost.
- **Operation Spider's Web**: Used FPV drones smuggled in mobile cabins to destroy 41 Russian aircraft, showcasing deep-strike capabilities.

Comparison:

- **FPV Drones vs. Traditional Weapons**: Drones are cheaper and reduce casualties compared to jets or missiles.
- **India vs. Ukraine**: India's DRDO is developing drones, but Ukraine's operational success sets a benchmark.

Key Features/Details:

- **Operation Details**:
- Targeted five Russian air bases (Murmansk, Irkutsk, Ivanovo, Ryazan, Amur).
- Destroyed strategic bombers (Tu-95, Tu-22M3).
- **Tactics**:
- Used Trojan horse-like smuggling in mobile cabins for surprise attacks.
- **Implications**:
- Demonstrates drones' ability to strike deep into enemy territory.
- Exposes vulnerabilities of traditional military assets.

- Necessitates investment in anti-drone systems.

Challenges and Implications:

- **Vulnerability**: Indian military bases need anti-drone defenses.
- **R&D Gap**: Limited indigenous drone technology hinders self-reliance.
- **Regulation**: Unregulated drones pose internal security risks.

Way Forward:

- Accelerate DRDO's drone development programs.
- Invest in AI-based anti-drone systems.
- Regulate civilian drone use to prevent misuse.

OPERATION RISING LION: ISRAEL ATTACKS IRAN

Source: *International Security Reports, June 2025; The Hindu, June 2025*

UPSC Connection: Geopolitics, West Asia; Relevant for UPSC Prelims and Mains (GS Paper 2 – International Relations; GS Paper 3 – Security)

Overview:

Israel's **Operation Rising Lion** targeted Iran's nuclear and military infrastructure, including the Natanz facility, killing key military personnel. Triggered by an IAEA resolution declaring Iran non-compliant with nuclear obligations, the operation escalates West Asian tensions with global implications.

Definition/Detailing:

- **Operation Rising Lion**: A large-scale Israeli airstrike on Iran's nuclear sites, missile bases, and military personnel.
- **Natanz Facility**: Iran's primary uranium enrichment site, critical for its nuclear program.

Comparison:

- **Israel-Iran vs. India-Pakistan**: Both involve regional rivalries with nuclear dimensions, but Israel-Iran escalations have broader global impacts due to oil routes.
- **2025 vs. Past Conflicts**: The operation is Israel's largest attack since the 1967 war, surpassing earlier skirmishes.

Key Features/Details:

- **Targets**:
- Natanz nuclear facility, missile sites, and bases in Tabriz, Tehran, and Kermanshah.

- Killed top officials like Maj Gen Mohammad Bagheri and Gen Hossein Salami.
- **Trigger**:
- IAEA resolution (2025) citing Iran's non-compliance with nuclear obligations.
- **Implications**:
- Weakens Iran's military and nuclear capabilities.
- Risks nuclear disaster and regional instability.
- Strengthens Israel-Arab ties via Abraham Accords.

Challenges and Implications:

- **Oil Supply**: Disruptions via the Strait of Hormuz threaten India's energy security.
- **Diplomatic Balancing**: India must navigate ties with Iran, Israel, and Arab states.
- **Nuclear Risks**: Potential radiation leaks require global monitoring.

Way Forward:

- Strengthen Operation Sindhu for diaspora safety.
- Engage diplomatically for de-escalation.
- Diversify oil imports to mitigate Strait risks.

PRESIDENT OF PARAGUAY VISITS INDIA

Source: *Ministry of External Affairs, June 2025; The Indian Express, June 2025*

UPSC Connection: Bilateral Relations, Global South; Relevant for UPSC Prelims and Mains (GS Paper 2 – International Relations)

Overview:

The Paraguayan President's visit to India in June 2025 strengthens bilateral ties in digital technology, critical minerals, and agriculture. The visit, part of India's Latin America outreach, aligns with shared Global South challenges and MERCOSUR trade opportunities.

Definition/Detailing:

- **India-Paraguay Relations**: Established in 1961, based on shared democratic values and Global South priorities.
- **MERCOSUR**: A South American trade bloc, including Paraguay, with which India has a Preferential Trade Arrangement.

Comparison:

- **India-Paraguay vs. India-Brazil**: Brazil is a larger MERCOSUR partner, but Paraguay offers niche opportunities in minerals and agriculture.
- **India vs. Other Global South Nations**: India's DPI expertise positions it as a leader for countries like Paraguay.

Key Features/Details:

- **Bilateral Trade**:
- $477 million in FY23, with India exporting vehicles and pharmaceuticals, importing soya oil and minerals.
- **Cooperation Areas**:
- Digital Public Infrastructure (DPI), critical minerals, energy, agriculture (AgriStack), healthcare, defense, and railways.
- **Global South Synergy**:
- Shared challenges like cybercrime and drug trafficking.
- Paraguay's resource wealth complements India's tech expertise.
- **MERCOSUR**:
- Enhances India's trade access to Latin America.

Challenges and Implications:

- **Trade Scale**: Limited trade volume requires sustained efforts.
- **Geopolitical Risks**: Balancing relations with MERCOSUR amidst U.S.-China rivalry.
- **Implementation**: DPI and mineral cooperation need technical capacity building.

Way Forward:

- Expand trade through MERCOSUR PTA negotiations.
- Share DPI expertise via capacity-building programs.
- Strengthen defense and space collaboration with Paraguay.

INDIA NOT KEEN TO DENT TRADE TIES WITH TURKEY

Source: *Ministry of Commerce, June 2025; The Economic Times, June 2025*

UPSC Connection: Bilateral Relations, Trade; Relevant for UPSC Prelims and Mains (GS Paper 2 – International Relations; GS Paper 3 – Economy)

Overview:

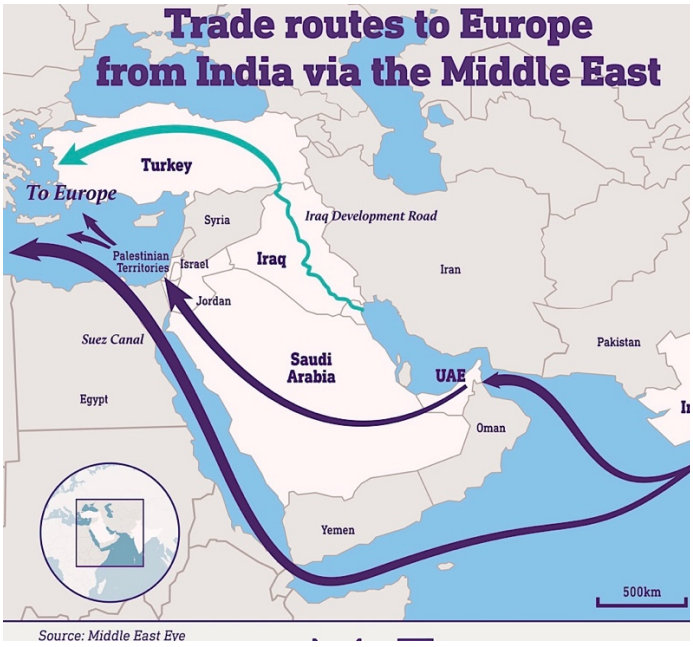
Despite Turkey's support for Pakistan's anti-India agenda, India is cautious about disrupting trade ties, given its $2.73 billion trade surplus with Turkey in FY25. The government balances economic interests with diplomatic signaling to maintain stable relations.

Definition/Detailing:

- **India-Turkey Trade**: India exports $5.72 billion (engineering goods, MSMEs) and imports $2.99 billion (marble, gold, apples).
- **Trade Surplus**: India's favorable balance supports economic stability amidst geopolitical tensions.

Comparison:

- **India-Turkey vs. India-Cyprus**: India's support for Cyprus counters Turkey, but trade with Turkey is prioritized due to economic benefits.
- **India vs. Other Trade Partners**: Turkey's engineering imports are significant, unlike smaller partners like Cyprus.



Key Features/Details:

- **Trade Dynamics**:
- India's exports driven by MSMEs (50% of engineering goods).
- Imports include mineral oil, cement, and pearls.
- **Geopolitical Tensions**:
- Turkey's criticism of India's actions in Pakistan-occupied Kashmir strains ties.
- **Government Stance**:
- Avoids trade blockades to protect economic interests and MSME exports.

Challenges and Implications:

- **Geopolitical Risks**: Turkey's Pakistan alignment complicates relations.
- **Trade Dependence**: Overreliance on engineering exports risks vulnerability.
- **Diplomatic Balance**: Maintaining trade while countering Turkey's stance is challenging.

Way Forward:

- Diversify export markets to reduce Turkey dependence.
- Engage Turkey diplomatically to address geopolitical issues.
- Strengthen MSME support for sustained trade growth.

IAEA DECLARES IRAN IN BREACH OF NUCLEAR NON-PROLIFERATION OBLIGATIONS

Source: *IAEA Resolution, June 2025; The Economic Times, June 2025*

UPSC Connection: International Agreements, Nuclear Proliferation; Relevant for UPSC Prelims and Mains (GS Paper 2 – International Relations)

Overview:

The **International Atomic Energy Agency (IAEA)** declared Iran non-compliant with its **Nuclear Non-Proliferation Treaty (NPT)** obligations, citing undeclared nuclear activities and a 400 kg stockpile of 60% enriched uranium. Iran's threat to exit the NPT escalates global nuclear risks.

Definition/Detailing:

- **IAEA**: The UN's nuclear watchdog, monitoring compliance with the NPT.
- **NPT**: A 1968 treaty to prevent nuclear proliferation, allowing peaceful nuclear use under inspections.
- **Iran's Nuclear Program**: Includes enrichment facilities like Natanz, Fordow, and Isfahan, targeted by Israel and the U.S.

Comparison:

- **Iran vs. North Korea**: Both face NPT scrutiny, but Iran's strategic location amplifies global concerns.
- **Pre- vs. Post-2015 JCPOA**: The 2015 nuclear deal lifted sanctions, but its collapse (2018) and recent attacks renewed tensions.

Key Features/Details:

- **IAEA Resolution**:
- Cites Iran's undeclared nuclear activities at three sites.
- Notes 400 kg of 60% enriched uranium, close to weapons-grade (90%).
- **Ramifications**:
- Risks UNSC sanctions and European "snap-back" measures.
- Iran threatens NPT withdrawal, reducing IAEA oversight.
- **NPT Withdrawal**:
- **Article 10**: Allows withdrawal with three months' notice, citing extraordinary events.
- Risks increased opacity and sets a precedent for other states.

Challenges and Implications:

- **Nuclear Risks**: Loss of IAEA oversight increases proliferation threats.
- **Sanctions**: Impact India's Chabahar and INSTC projects.
- **Precedent**: Iran's exit could encourage others to leave NPT.

Way Forward:

- Strengthen IAEA inspections through diplomatic pressure.
- Support JCPOA revival for de-escalation.
- Diversify India's energy imports to reduce Iran dependence.

US ENTERS IRAN-ISRAEL CONFLICT

Source: *International Security Reports, June 2025; The Hindu, June 2025*

UPSC Connection: Geopolitics, West Asia; Relevant for UPSC Prelims and Mains (GS Paper 2 – International Relations; GS Paper 3 – Security)

Overview:

The U.S. entered the Israel-Iran conflict by attacking Iran's nuclear facilities (Fordow, Isfahan, Natanz), reinforcing its "iron-clad" support for Israel. Iran retaliated with missile strikes on a U.S. base in Qatar, escalating West Asian tensions with global repercussions.

Definition/Detailing:

- **U.S.-Israel Alliance**: A strategic partnership driven by shared security concerns, particularly Iran's nuclear program.
- **Iran's Nuclear Sites**: Fordow, Isfahan, and Natanz are key uranium enrichment facilities, critical for nuclear weapon potential.

Comparison:

- **U.S.-Iran vs. U.S.-Iraq (2003)**: Both involve claims of weapons of mass destruction, but Iran's conflict risks broader regional destabilization.
- **Israel vs. U.S. Role**: Israel's strikes targeted specific sites, while U.S. attacks aimed for total destruction, escalating the conflict.

Key Features/Details:

- **U.S. Strikes**:
- Targeted Fordow, Isfahan, and Natanz, claiming complete destruction.
- **Iran's Retaliation**:
- Missile attacks on al-Udeid Air Base in Qatar, intercepted with no casualties.
- **Implications**:
- Strengthens U.S.-Israel ties and Abraham Accords with Arab states.
- Weakens Iran militarily and politically, killing 600+ civilians.
- Risks nuclear disaster and trade disruptions via the Strait of Hormuz.

Challenges and Implications:

- **Energy Security**: Strait disruptions spike oil prices, affecting India's economy.
- **Diplomatic Balancing**: India must maintain ties with Iran, Israel, and the U.S.
- **Regional Stability**: Escalation risks broader conflict involving Arab states.

Way Forward:

- Enhance Operation Sindhu for diaspora evacuation.
- Diversify oil imports to mitigate Strait risks.
- Advocate de-escalation via UNSC forums.

SIGNIFICANCE OF IRAN FOR INDIA

Source: *Ministry of External Affairs, June 2025; The Indian Express, June 2025*

UPSC Connection: Bilateral Relations, Energy Security; Relevant for UPSC Prelims and Mains (GS Paper 2 – International Relations; GS Paper 3 – Energy)

Overview:

Iran's strategic importance for India lies in its location, oil supplies, and connectivity projects like **Chabahar Port** and **INSTC**. The Israel-Iran conflict complicates India's diplomatic and economic ties, prompting Operation Sindhu and increased Russian oil imports.

The strategic and economic importance of Iran's Chabahar port will be greatly

Definition/Detailing:

- **Chabahar Port**: A strategic Indian project in Iran for connectivity to Afghanistan and Central Asia, bypassing Pakistan.
- **INSTC**: A 7,200 km corridor connecting India to Russia and Europe via Iran.

Comparison:

- **Iran vs. Saudi Arabia**: Iran offers connectivity advantages, while Saudi Arabia is a larger oil supplier.
- **Pre- vs. Post-Sanctions**: Iran was a top oil supplier pre-2018; sanctions reduced trade, but Chabahar remains critical.

Key Features/Details:

- **Historical Ties**:
- India-Iran Friendship Treaty (1950), Tehran (2001), and New Delhi (2003) Declarations.
- **Strategic Importance**:
-
- **Location**: Lies at the crossroads of West Asia, Central Asia, and South Asia.
- **Chabahar Port**: Bypasses Pakistan for Afghanistan and Central Asia access.
- **INSTC**: Reduces transit time and costs for Eurasian trade.
- **Oil and Trade**:
- Iran was a top oil supplier pre-sanctions, offering favorable terms.
- Exports to Iran ($1.24 billion in FY25) include rice, tea, and pharmaceuticals.
- **India's Response**:
- Operation Sindhu to evacuate Indians from Iran and Israel.
- Increased Russian oil imports amid West Asian volatility.

Challenges and Implications:

- **Sanctions**: U.S. sanctions limit India-Iran trade.

- **Geopolitical Risks**: Israel-Iran conflict threatens Chabahar's viability.
- **Energy Dependence**: Oil price volatility impacts India's economy.

Way Forward:

- Secure Chabahar's operations through diplomatic exemptions.
- Diversify oil imports to reduce West Asian risks.
- Strengthen INSTC for Eurasian connectivity.

WHY IS THE STRAIT OF HORMUZ CRITICAL FOR INDIA?

Source: *Ministry of External Affairs, June 2025; The Hindu, June 2025*

UPSC Connection: Energy Security, Geopolitics; Relevant for UPSC Prelims and Mains (GS Paper 2 – International Relations; GS Paper 3 – Energy)

Overview:

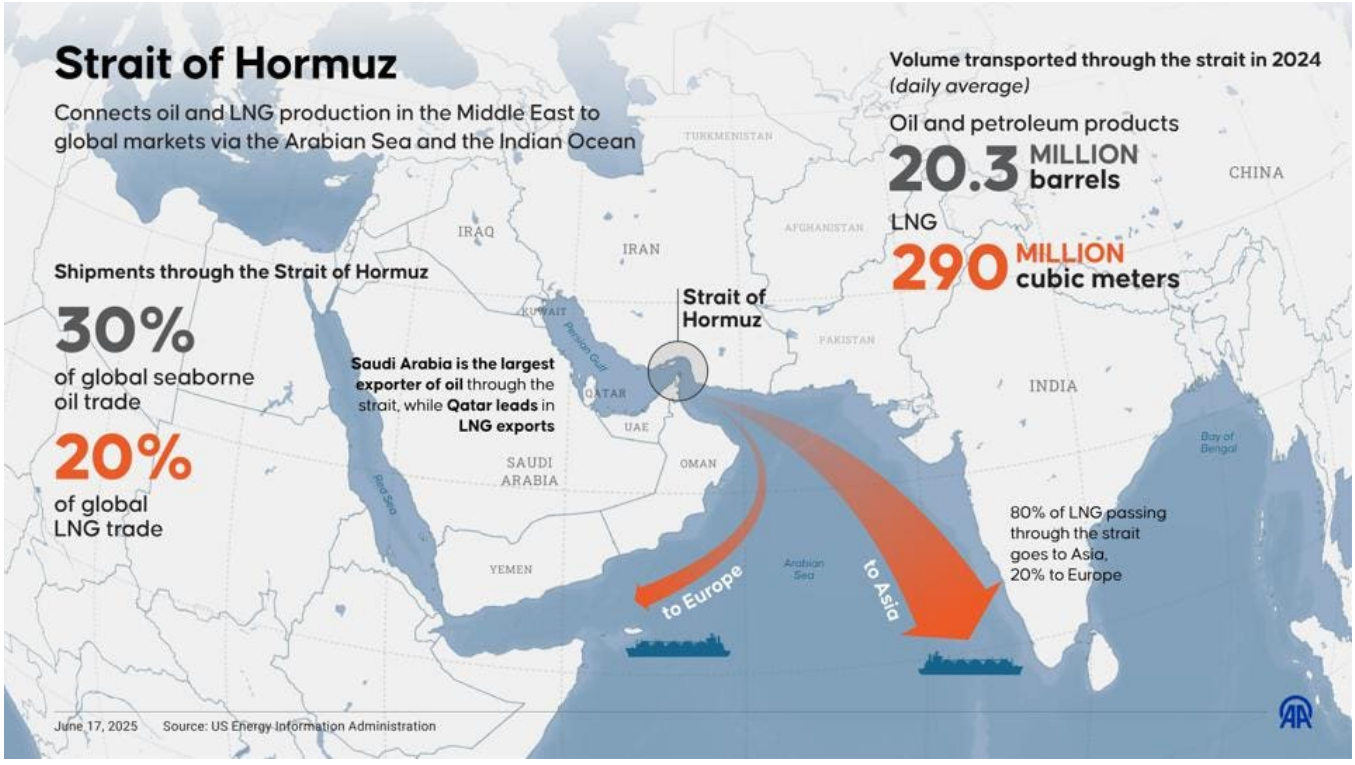
The **Strait of Hormuz**, a critical energy chokepoint, faces potential closure threats due to the Israel-Iran conflict. India, reliant on the Strait for 40% of its oil and 54% of LNG imports, faces economic risks from price spikes and supply disruptions.

Definition/Detailing:

- **Strait of Hormuz**: A 33 km-wide waterway connecting the Persian Gulf to the Arabian Sea, handling 20% of global oil and gas.
- **Energy Dependence**: India imports 85% of its crude oil, with 40% transiting the Strait.

Comparison:

- **Strait of Hormuz vs. Malacca Strait**: Both are critical chokepoints, but Hormuz is more vital for India's oil imports.
- **India vs. China**: China's larger oil imports (75% from Iran) amplify its vulnerability to Strait disruptions.



Key Features/Details:

- **Strategic Importance**:
- Handles oil from Saudi Arabia, Iraq, UAE, Qatar, and Iran.
- Closure could raise oil prices to $120–150/barrel from $74.
- **Iran's Threat**:
- Iran's Parliament approved closure, pending Supreme National Security Council decision.
- **Risks for India**:
- Increases freight and insurance costs, impacting trade deficits.
- Indirect effects via China's demand for India's suppliers.
- **Historical Context**:
- Never closed, even during past conflicts, due to global energy importance.

INDIA'S NUCLEAR ARSENAL EXPANSION (SIPRI REPORT 2025)

Source: *The Indian Express (July 16, 2025), SIPRI Yearbook 2025 (July 15, 2025)*

UPSC Connection:

GS2 (International Relations, Global Security), GS3 (Science and Technology, Security Challenges).

Definition/Detailing:

The Stockholm International Peace Research Institute (SIPRI) Yearbook 2025 reports that India has marginally increased its nuclear warhead stockpile from 172 in 2024 to 180 in 2025. These warheads are operational and deployable, supported by ongoing advancements in delivery systems, including canisterized missiles capable of carrying multiple warheads. Globally, nine countries possess nuclear arsenals, with the US and Russia holding 90% of the 12,241 warheads.

Overview:

India's nuclear arsenal expansion, as per SIPRI 2025, reflects its focus on strengthening strategic deterrence amid regional tensions with China and Pakistan. The global nuclear stockpile remains a concern, with SIPRI warning of potential increases in deployed warheads if the US-Russia New START treaty expires in 2026 without renewal.

World nuclear forces, January 2025

	Deployed warheads[a]		Stored warheads[b]	Military stockpile[c]	Retired warheads[d]		Total inventory[e]	
	2025		2025	2024	2025	2024	2025	2024	2025
United States	1 770		1 930	3 708	3 700	1 620	1 477	5 328	5 177
Russia	1 718		2 591	4 380	4 309[f]	1 200	1 150	5 580	5 459
United Kingdom	120		105	225	225	-	-	225	225
France	280		10	290	290	-	-	290	290
China	24		576	500	600	-	-	500	600
India	-		180	172	180	-	-	172	180
Pakistan	-		170	170	170	-	-	170	170
North Korea	-		50	50	50[g]	-	-	50	50[g]
Israel	-		90	90	90	-	-	90	90
Total	3 912		5 702	9 585	9 614	2 820	2 627	12 405[h]	12 241

Comparison:

- **India vs. Regional Powers**:

  India (180 warheads): Focuses on credible minimum deterrence, with advancements in missile technology (e.g., Agni series).

  China (600 warheads): Rapidly expanding its arsenal, posing a strategic challenge to India.

  Pakistan (170 warheads): Maintains a comparable stockpile but lags in delivery system sophistication.

- **Global Context**: The US and Russia dominate with ~90% of global warheads, while other nuclear states (UK, France, Israel, North Korea) maintain smaller arsenals. India's nuclear growth is modest compared to China's expansion.

Key Features/Details:

- **India's Arsenal**: Increased from 172 warheads (2024) to 180 warheads (2025), with new delivery systems like canisterized missiles enhancing flexibility and survivability.
- **Global Nuclear Landscape**: 12,241 warheads across nine countries (US, Russia, UK, France, China, India, Pakistan, North Korea, Israel).
- **New START Treaty**: The 2010 US-Russia treaty limits strategic nuclear arsenals but faces uncertainty post-2026, potentially escalating global nuclear risks.
- **Technological Advancements**: India's development of multiple-warhead missiles (MIRVs) strengthens its second-strike capability, crucial for deterrence.

INDIA'S CHANGING COUNTER-TERRORISM STRATEGY

Source: *The Hindu, July 10, 2025; PIB, July 12, 2025*

UPSC Connection: Internal Security, International Relations; Relevant for UPSC Prelims and Mains (GS Paper III – Security and Disaster Management)

Definition/Detailing:

India's counter-terrorism strategy has evolved from a policy of strategic restraint to one of proactive retaliation and strategic assertiveness, as exemplified by Operation Sindoor. This operation targeted terrorist infrastructure deep within Pakistan and Pakistan-occupied Kashmir (PoK), reflecting a zero-tolerance approach to cross-border terrorism. It marks a shift in India's military and diplomatic posture, emphasizing swift and decisive action against both terrorist groups and their state sponsors.

Comparison:

- **Past vs. Present Strategy:** Earlier, India's response to terrorism, such as during the 1999 Kargil conflict, was limited to localized engagements within its borders. Operation Sindoor, however, saw India strike targets up to 100 km inside Pakistan and PoK, showcasing a willingness to escalate military action beyond its borders.
- **India vs. Global Counter-Terrorism:** India's approach mirrors NATO's post-9/11 operations in Afghanistan, where state sponsors of terrorism were targeted alongside terrorist groups. Unlike NATO's prolonged engagements, India's strategy emphasizes short, high-impact operations to minimize escalation risks.

Overview:

Operation Sindoor, launched in response to the Pahagam terror attack, signifies India's new counter-terrorism doctrine. It involved precision strikes on nine terror locations in Pakistan and PoK, successfully neutralizing threats and thwarting Pakistani drone incursions. The operation concluded with a ceasefire on May 10, 2025, but the Indian Prime Minister emphasized that military action is suspended, not terminated, signaling a lowered threshold for future responses.

Key Features/Details:

- **Proactive Retaliation:** India's shift from restraint to swift, escalated retaliation targets terrorist infrastructure and state-protected assets.
- **Zero Tolerance Doctrine:** Both terrorist groups (e.g., Lashkar-e-Taiba, Jaish-e-Mohammed) and their state sponsors are treated as equal threats, broadening the scope of military action.
- **Expanded Engagement:** Unlike the localized Kargil conflict, Operation Sindoor involved

deep strikes, showcasing advanced military capabilities.

- **International Narrative Control:** India linked Pakistan-based terrorism to global attacks (e.g., in the US and UK), framing its actions as part of the global war on terror. Diplomatic outreach to multiple nations reinforced India's zero-tolerance stance.
- **Ceasefire and Future Posture:** The ceasefire on May 10, 2025, de-escalated tensions, but India's lowered threshold for military action establishes a "new normal" in its security policy.

India-Pakistan Relations and Regional Stability:

- The operation underscores the fragile nature of India-Pakistan relations, with potential for escalation if miscalculations occur.
- India's diplomatic outreach aims to isolate Pakistan internationally, but it must navigate concerns from neighbors like China and global powers wary of regional conflict.
- Aspirants should study the Simla Agreement (1972) and Lahore Declaration (1999) to understand the historical context of bilateral de-escalation efforts.

RESURGENCE OF BOKO HARAM IN NIGERIA

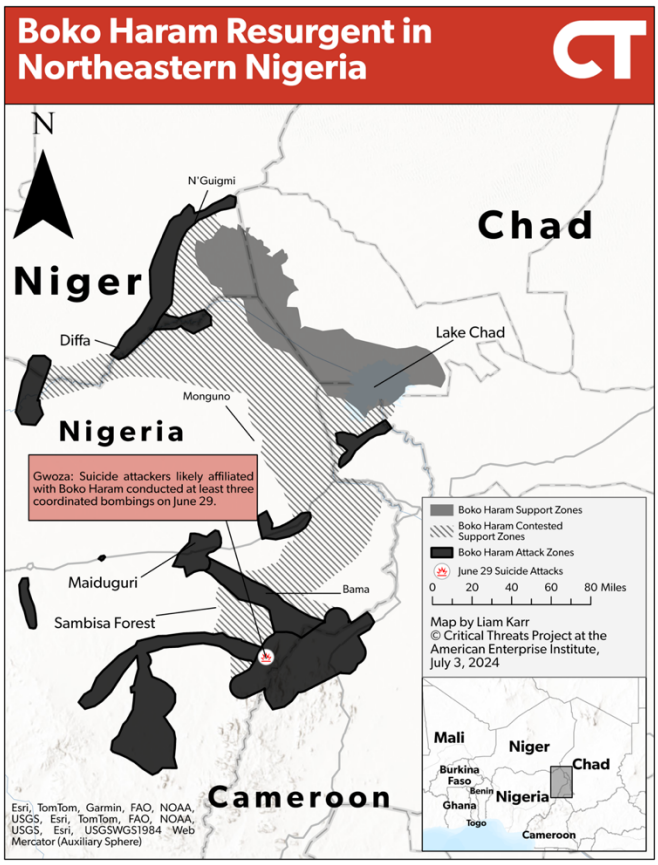
Source: *The Hindu (July 18, 2025), Al Jazeera (July 17, 2025)*

UPSC Connection:

GS2 (International Relations, Global Security Issues), GS3 (Internal Security, Linkages of Organized Crime with Terrorism).

Definition/Detailing:

Boko Haram, officially known as Jama'atu Ahlis Sunna Lidda'awati wal-Jihad (JAS), is a jihadist militant group founded in 2002 by Mohammed Yusuf in Borno state, Nigeria. The name "Boko Haram" translates to "Western Education is Forbidden," reflecting its ideological opposition to Western education, secular governance, and modern institutions. The group seeks to impose a radical interpretation of Islamic law (Sharia) in northeastern Nigeria and neighboring regions, including Chad, Niger, northern Cameroon, and Mali. Since 2009, it has engaged in violent insurgency, targeting military, civilian, and militia groups.



Overview:

The resurgence of Boko Haram in 2025, particularly in Nigeria's Borno state, has raised concerns about deteriorating security in West Africa. Despite earlier military successes in reclaiming territories, the group's recent attacks on military outposts, civilian settlements, and local militias indicate a revival of its influence. The

insurgency has displaced over 2 million people and caused approximately 35,000 civilian deaths, posing significant humanitarian and security challenges.

Comparison:

- **Boko Haram vs. ISWAP**: Boko Haram has split into two factions:

  Islamic State West Africa Province (ISWAP): Aligned with the Islamic State, ISWAP focuses on attacking military outposts and strategic targets, leveraging sophisticated tactics.

  JAS (Boko Haram): The original faction engages in indiscriminate attacks on civilians, abductions for ransom, and robberies, reflecting a less structured but highly disruptive approach.

- **Regional Comparison**: Similar to other jihadist groups like Al-Shabaab in Somalia or ISIS in the Middle East, Boko Haram exploits local grievances, poverty, and weak governance to sustain its insurgency.

Key Features/Details:

- **Origins and Ideology**: Founded in 2002, Boko Haram opposes Western education and secular governance, aiming to establish a theocratic state based on its interpretation of Islamic law.
- **Geographical Spread**: Active in northeastern Nigeria (Borno state as epicenter) and extends to Chad, Niger, Cameroon, and Mali.
- **Peak Influence**: In 2013–14, Boko Haram controlled an area the size of Belgium, showcasing its territorial ambitions.
- **Current Challenges**: Nigeria's armed forces struggle to contain the insurgency, with recent attacks signaling a potential return to peak violence levels.
- **Humanitarian Impact**: Over 2 million internally displaced persons (IDPs) and 35,000 civilian deaths highlight the severe social and economic toll.

EXERCISE KHAAN QUEST

Source: *PIB, June 15, 2025; The Times of India, June 16, 2025*

UPSC Connection: International Relations, Defense Cooperation; Relevant for UPSC Prelims and Mains (GS Paper II – International Relations, GS Paper III – Security)

Definition/Detailing:

Exercise Khaan Quest 2025 is an annual multinational military exercise hosted by Mongolia in Ulaanbaatar, aimed at enhancing peacekeeping capabilities. It involves over 20 countries, including India, and focuses on physical fitness, joint planning, and tactical drills to strengthen interoperability in peacekeeping operations.

Comparison:

- **Khaan Quest vs. Nomadic Elephant:** While Khaan Quest is a multilateral exercise focusing on peacekeeping, Nomadic Elephant is a bilateral exercise between India and Mongolia, emphasizing operational readiness and contemporary security challenges.
- **India vs. Other Participants:** India's participation highlights its growing role in global peacekeeping, unlike some countries (e.g., China) that prioritize regional security exercises over multilateral peacekeeping drills.

Overview:

Held in June 2025, Exercise Khaan Quest brought together military contingents from over 20 nations to enhance peacekeeping capabilities. India's participation underscores its commitment to global peace and security, aligning with its contributions to UN peacekeeping missions.

Key Features/Details:

- **Multinational Participation:** Over 20 countries, including India, collaborated in Ulaanbaatar.
- **Objective:** Enhance peacekeeping capabilities through joint planning and tactical drills.
- **Focus Areas:** High physical fitness, interoperability, and coordinated responses to peacekeeping challenges.
- **India's Role:** Indian contingents demonstrated advanced skills in joint operations, reinforcing India's leadership in peacekeeping.

India-Mongolia Defense Cooperation:

- **Historical Ties:** India and Mongolia share historical and cultural links, strengthened by exercises like Nomadic Elephant and Khaan Quest.
- **Geopolitical Significance:** The exercise counters China's influence in Central Asia, aligning with India's strategic interests.
- **Future Potential:** Enhanced cooperation could lead to joint defense production and training programs.

INDIA-MONGOLIA JOINT MILITARY EXERCISE: NOMADIC ELEPHANT

Source: *PIB, June 18, 2025; The Hindu, June 19, 2025*

UPSC Connection: International Relations, Defense Cooperation; Relevant for UPSC Prelims and Mains (GS Paper II – International Relations, GS Paper III – Security)

Definition/Detailing:

The 17th edition of Nomadic Elephant, a bilateral military exercise between India and Mongolia, was conducted in June 2025 at the Special Forces Training Centre in Ulaanbaatar. It aims to enhance operational readiness, deepen defense ties, and strengthen responses to contemporary security challenges.

Comparison:

- **Nomadic Elephant vs. Khaan Quest:** Nomadic Elephant is bilateral, focusing on India-Mongolia defense ties, while Khaan Quest is multilateral, emphasizing peacekeeping. Nomadic Elephant addresses broader security challenges, including counter-terrorism.
- **India vs. Other Bilateral Partners:** Unlike exercises with the US (e.g., Yudh Abhyas), Nomadic Elephant focuses on special forces training in a resource-constrained environment, reflecting Mongolia's unique geopolitical context.

Overview:

Nomadic Elephant 2025, held alternately in India and Mongolia, strengthens bilateral defense cooperation. The exercise focuses on joint special forces operations, enhancing interoperability and readiness for modern security threats like terrorism and hybrid warfare.

Key Features/Details:

- **Annual Exercise:** Conducted alternately in India and Mongolia since 2006.
- **Objective:** Enhance operational readiness and defense ties.
- **Focus Areas:** Counter-terrorism, special forces operations, and joint tactical drills.
- **Location:** Special Forces Training Centre, Ulaanbaatar, Mongolia.
- **Outcome:** Improved interoperability and strengthened India-Mongolia strategic partnership.

India-Mongolia Strategic Partnership:

- **Historical Context:** India was the first non-communist country to establish diplomatic relations with Mongolia in 1955.
- **Geopolitical Significance:** The exercise counters China's Belt and Road Initiative by strengthening India's presence in Central Asia.
- **Future Potential:** Expanded cooperation in cybersecurity and counter-terrorism could further deepen ties.

INDIA-EU JOINT NAVAL EXERCISE IN THE INDIAN OCEAN

Source: *The Times of India, June 25, 2025; PIB, June 26, 2025*

UPSC Connection: International Relations, Maritime Security; Relevant for UPSC Prelims and Mains (GS Paper II – International Relations, GS Paper III – Security)

Definition/Detailing:

The India-EU Naval Exercise, conducted in June 2025 in the Indian Ocean, involved the Indian Navy and the European Union Naval Force (EUNAVFOR) under Operation ATALANTA. It aimed to enhance maritime security cooperation, focusing on counter-piracy tactics and interoperability to ensure a secure and open Indo-Pacific.

Comparison:

- **India-EU vs. India-US Exercises:** Unlike the Malabar Exercise with the US, which focuses on high-end warfare, the India-EU exercise prioritizes counter-piracy and maritime security, reflecting the EU's focus on non-traditional threats.
- **India vs. Other Maritime Partners:** India's exercises with ASEAN (e.g., SIMBEX) focus on regional cooperation, while the India-EU exercise emphasizes global maritime norms and counter-piracy.

Overview:

The joint naval exercise involved India's frigate INS Trikand and maritime patrol aircraft,

alongside EUNAVFOR assets. It aimed to strengthen interoperability, enhance counter-piracy capabilities, and promote a rules-based maritime order in the Indian Ocean and Indo-Pacific.

Key Features/Details:

- **Participants:** Indian Navy and EUNAVFOR (Operation ATALANTA).
- **Focus Areas:** Counter-piracy tactics, maritime security, and interoperability.
- **Assets Involved:** INS Trikand, Indian maritime patrol aircraft, and EU naval assets.
- **Objective:** Ensure a secure, free, and open Indo-Pacific through enhanced cooperation.
- **Outcome:** Strengthened India-EU defense ties and improved joint operational capabilities.

India-EU Maritime Cooperation:

- **Historical Context:** India and the EU have deepened defense ties since the 2004 Strategic Partnership Agreement.
- **Geopolitical Significance:** The exercise counters non-traditional threats like piracy and strengthens India's role in the Indo-Pacific.
- **Future Potential:** Joint exercises could expand to include cyber-maritime security and disaster response.

FIRST BATCH OF WOMEN GRADUATES FROM NDA

Source: *The Indian Express, June 20, 2025; PIB, June 22, 2025*

UPSC Connection: Women Empowerment, Social Justice; Relevant for UPSC Prelims and Mains (GS Paper I – Society, GS Paper II – Governance)

Definition/Detailing:

The graduation of 17 women cadets from the National Defence Academy (NDA) in Pune as part of the 148th batch marks a historic milestone in gender equality within India's armed forces. This development follows a 2021 Supreme Court directive to admit women to the NDA, enabling them to undergo the same rigorous training as men and paving the way for women to assume leadership roles in the military.

Comparison:

- **India vs. Global Militaries:** Countries like the US and Israel have long integrated women into combat roles, but India's inclusion of women in the NDA is a recent step toward parity. Unlike the US, where women have served in combat since 2015, India still restricts women from certain combat streams.
- **Pre-2021 vs. Post-2021:** Before 2021, women in the Indian military were limited to non-combat roles and Short Service Commissions. The NDA's inclusion of women aligns with global trends toward gender-neutral military training.

Overview:

The inclusion of women in the NDA's 148th batch is a landmark achievement, breaking the male exclusivity of India's premier tri-services academy. Women cadets now train alongside men in 18 squadrons, preparing them for leadership roles across the Army,

Navy, and Air Force. This move aligns with broader efforts to promote gender equality in traditionally male-dominated institutions.

Key Features/Details:

- **Historic Milestone:** 17 women graduated alongside male cadets, marking the first co-ed batch from the NDA.
- **Equal Training:** Women undergo the same rigorous physical, academic, and leadership training as men, ensuring parity in preparation.
- **Breaking Stereotypes:** The inclusion challenges the notion that women are suited only for non-combat or "pink-collar" roles.
- **Path to Leadership:** NDA training equips women for command roles, potentially leading to service chiefs in the future.
- **Social Impact:** The move promotes societal acceptance of women in leadership and non-traditional careers.

Gender Equality in the Military:

- **Institutional Reforms:** The military must adopt gender-neutral evaluation criteria and promotion boards to ensure merit-based advancement.
- **Global Best Practices:** Countries like Canada and Norway offer models for integrating women into combat roles, emphasizing training and cultural change.
- **Societal Ripple Effects:** Women in the NDA could inspire greater female participation in STEM and leadership roles, aligning with India's vision of inclusive development.

SOCIOLOGY

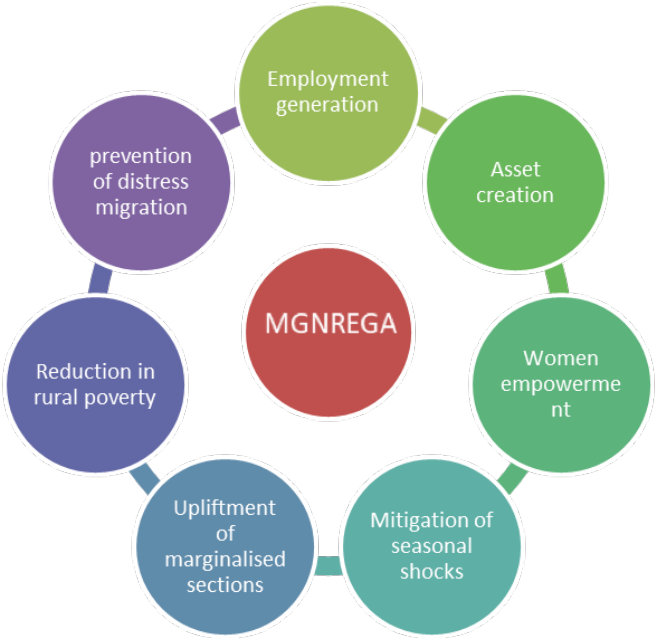
CENTRE CAPS MGNREGA SPENDING AT 60%

Source: *The Hindu, July 7, 2025; PIB, July 8, 2025*

UPSC Connection: Welfare Schemes, Rural Development; Relevant for UPSC Prelims and Mains (GS Paper II – Governance, GS Paper III – Economy)

Definition/Detailing:

The Union Finance Ministry has capped MGNREGS spending at 60% of its annual allocation for the first half of FY26 to manage fiscal resources. This move, part of the Monthly/Quarterly Expenditure Plan (MEP/QEP), aims to ensure budget availability in the latter half of the fiscal year but risks violating workers' statutory rights.



Comparison:

- **MGNREGS vs. Other Welfare Schemes:** Unlike PM-KISAN, which has fixed payouts, MGNREGS is demand-driven, making expenditure caps controversial.
- **India vs. Global Practices:** Countries like Brazil's Bolsa Familia ensure flexible funding for welfare, unlike India's restrictive cap.

Overview:

The MGNREGS, a demand-driven employment guarantee scheme, faces a 60% spending cap until September 2025 to address fiscal mismanagement. Critics argue this violates statutory rights to employment and timely wages, as upheld by judgments like Swaraj Abhiyan (2016).

Key Features/Details:

- **Spending Cap:** Limits MGNREGS expenditure to 60% of the annual budget in the first half of FY26.
- **Rationale:** Over 70% of the budget is typically exhausted by Q2, leading to pending dues of Rs 15,000–25,000 crore annually.
- **Criticism:** The cap may force states to deny employment or delay wages, violating MGNREGA's guarantees.
- **Legal Concerns:** Courts have ruled that financial constraints cannot override statutory obligations.
- **Impact:** Workers in the informal sector, reliant on MGNREGS, face economic insecurity.

Rural Employment and Fiscal Management:

- **Demand-Driven Nature:** MGNREGS's unique structure requires flexible funding, which the cap undermines.
- **Policy Recommendations:** A contingency fund and real-time expenditure monitoring could prevent dues.
- **Future Directions:** Integrating MGNREGS with skill development programs could enhance rural employability.

TRIBAL WELFARE OUTREACH CAMPAIGN

Source: *PIB, July 10, 2025; The Indian Express, July 11, 2025*

UPSC Connection: Welfare Schemes, Vulnerable Sections; Relevant for UPSC Prelims and Mains (GS Paper II – Governance, GS Paper I – Society)

Definition/Detailing:

The Tribal Welfare Outreach Campaign, launched by the Ministry of Tribal Affairs, aims to deliver welfare schemes to over 1 lakh tribal-dominated villages across 500 districts. It includes flagship programs like PM JANMAN and Dharti Aaba Janjatiya Gram Utkarsh Abhiyan, focusing on infrastructure, health, education, and livelihoods.

Comparison:

- **PM JANMAN vs. Dharti Aaba:** PM JANMAN targets Particularly Vulnerable Tribal Groups (PVTGs) with basic facilities, while Dharti Aaba focuses on comprehensive development of tribal-majority villages.

- **India vs. Global Practices:** Australia's Indigenous welfare programs offer targeted funding, unlike India's broader approach, which faces implementation challenges.

Overview:

Launched as part of Janjatiya Gaurav Varsh (celebrating Birsa Munda's birth anniversary), the campaign ensures last-mile delivery of welfare schemes. It integrates 17 ministries and 25 interventions to address critical gaps in tribal development.

Key Features/Details:

- **Coverage:** Over 500 districts and 1 lakh tribal villages.
- **Flagship Schemes:** PM JANMAN (housing, water, education for PVTGs) and Dharti Aaba (infrastructure, health, livelihoods).
- **Delivery Mechanism:** Localized camps for documentation, health cards, and welfare enrollment.
- **Nodal Agency:** Ministry of Tribal Affairs, coordinating 17 ministries.
- **Timeline:** Dharti Aaba spans FY25–FY29, with specific targets for each ministry.

Tribal Development and Inclusion:

- **Historical Context:** Tribal marginalization stems from colonial policies and post-independence neglect.
- **Policy Recommendations:** Strengthening Gram Sabhas and FRA implementation will enhance community control.
- **Future Directions:** Integrating tribal knowledge into development planning could ensure sustainability.

BENEFIT AS A FUNDAMENTAL RIGHT: SUPREME COURT JUDGMENT

Source: *The Hindu, July 5, 2025; Indian Express, July 6, 2025*

UPSC Connection: Women's Rights, Social Justice; Relevant for UPSC Prelims and Mains (GS Paper I – Society, GS Paper II – Governance)

Definition/Detailing:

In the landmark K. Uma Devi vs. State of Tamil Nadu (2025) judgment, the Supreme Court declared maternity benefits a fundamental right under Article 21 (Right to Life and Personal Liberty). The ruling emphasizes that maternity benefits are essential for women's dignity, health, and workforce participation, aligning with international conventions like CEDAW and ILO's Maternity Protection Convention (C183).

Comparison:

- **India vs. Global Standards:** India's 26-week paid maternity leave exceeds the ILO's C183 minimum of 14 weeks, placing it among 42 nations with generous maternity policies. However, unlike countries like Sweden, India lacks a universal maternity financing system.
- **Formal vs. Informal Sector:** While public sector employees benefit from maternity rights, over 90% of India's female workforce in the informal sector struggles to access these benefits.

Overview:

The Supreme Court's ruling in K. Uma Devi vs. State of Tamil Nadu establishes maternity benefits as a fundamental right, reinforcing the Maternity Benefits Act, 1961, as a normative framework. The judgment aligns

with international standards and addresses challenges in ensuring equitable maternity benefits across sectors.

Key Features/Details:

- **Fundamental Right:** Maternity benefits are intrinsic to women's dignity, health, and livelihood under Article 21.
- **International Alignment:** The ruling cites UDHR, CEDAW, and ILO's C183, emphasizing special assistance for working women.
- **Generous Leave Policy:** India's 26-week paid maternity leave surpasses global standards.
- **Challenges Identified:** Limited application to the informal sector, funding constraints for MSMEs, and absence of a national maternity financing system.
- **Way Forward:** Mixed financing models, a Universal Maternity Fund, and global best practices (e.g., ILO's World Social Protection Report) are recommended.

Maternity Rights and Workforce Participation:

- **Informal Sector Challenges:** Over 90% of women workers lack access to formal maternity benefits, necessitating targeted schemes.
- **Global Best Practices:** Sweden's parental leave model and Germany's social insurance system offer lessons for India.
- **Policy Recommendations:** A Universal Maternity Fund and public-private partnerships could ensure sustainable financing.

EXTREME POVERTY IN INDIA DOWN TO 5.3% IN 2022-23

Source: *The Hindu, July 12, 2025; World Bank Report, July 10, 2025*

UPSC Connection: Poverty, Inclusive Growth; Relevant for UPSC Prelims and Mains (GS Paper III – Economy, GS Paper I – Society)

Definition/Detailing:

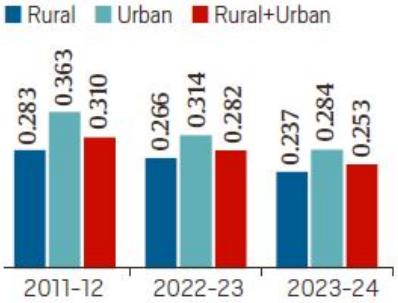
The World Bank's revised poverty threshold ($3/day, 2021 PPP) shows India's extreme poverty rate dropped from 27.1% in 2011-12 to 5.3% in 2022-23, lifting 270 million people out of poverty. The decline is attributed to targeted welfare schemes and economic growth.

TABLE 1: POVERTY RATIOS USING DIFFERENT CUT-OFFS: ALL INDIA

Poverty Line (PL) Cut-offs	Rural			Urban			Rural+urban		
	2011-12	2022-23	2023-24	2011-12	2022-23	2023-24	2011-12	2022-23	2023-24
150	66.6	34.8	27.8	52.8	27.8	21.7	62.6	32.8	26
125	51.3	20.8	14.8	40.1	16.9	11.9	48.1	19.7	13.9
115	43.5	15.8	9.9	34.7	12.9	8.8	41	15	9.6
100	30.9	9.6	4.9	26.8	9.3	4.8	29.5	9.5	4.9
85	18.3	4.8	4.2	18.1	4.6	4.1	18.3	4.7	4.2
75	11.1	4.2	3.7	12.4	4.1	3.6	11.5	4.2	3.7
50	3.9	2.8	2.5	4.3	2.7	2.4	4	2.8	2.4

Note:1. 100 per cent PL refers to Rangarajan Committee's Poverty Line, adjusted for CPI-based inflation. 2. Rural + Urban data are the weighted average; weights being their respective shares in the estimated persons. Source: Estimates using Household Consumer Expenditure Surveys of NSSO

Table 2: Gini Coefficient of Total Consumption Expenditure, All India



Source: Report No. 592 (HCES 2023-24), National Statistics Office

Comparison:

- **India vs. Global Poverty Trends:** India's poverty reduction outpaces Sub-Saharan Africa but lags behind East Asia due to uneven growth.
- **Old vs. New Poverty Line:** The revised $3/day threshold (up from $2.15) reflects inflation, providing a more accurate measure of poverty.

Overview:

India's extreme poverty rate fell to 5.3% in 2022-23, with 54.7 million people living below $3/day in 2024. The decline, supported by schemes like MGNREGS and PMJDY, highlights India's progress in inclusive growth, though challenges like inequality and lack of an official poverty line persist.

Key Features/Details:

- **Poverty Decline:** From 27.1% (344.47 million) in 2011-12 to 5.3% (75.24 million) in 2022-23.
- **Revised Threshold:** $3/day (2021 PPP), up 15% from $2.15/day.
- **Data Source:** Household Consumer Expenditure Survey (HCES) 2022-23, using Modified Mixed Recall Period (MMRP).
- **Inequality Reduction:** Gini Index fell from 28.78 (2011) to 25.51 (2022).
- **Welfare Schemes:** MGNREGS, NFSA, PMJDY, and PMAY drove poverty reduction.

Poverty Reduction Strategies:

- **Welfare Schemes:** MGNREGS and PMJDY provide safety nets, but implementation gaps need addressing.
- **Policy Recommendations:** An official poverty line and urban-focused schemes could enhance inclusivity.
- **Future Directions:** Integrating poverty metrics with SDGs and HDI will ensure holistic development.

NEED FOR GENDER EQUITY IN URBAN BUREAUCRACY

Source: *The Hindu, July 3, 2025; India Spend, July 4, 2025*

UPSC Connection: Urbanization, Gender Equality; Relevant for UPSC Prelims and Mains (GS Paper I – Society, GS Paper II – Governance)

Definition/Detailing:

India's urban bureaucracy remains male-dominated, with women constituting only 20% of the Indian Administrative Service (IAS) and 11.7% of the police force. This gender gap limits the integration of women's perspectives in urban planning, governance, and budgeting, affecting the inclusivity of India's rapidly urbanizing cities.

Comparison:

- **India vs. Global Practices:** Countries like the Philippines and South Korea have institutionalized gender equity in urban governance through parity laws and gender impact assessments, unlike India's tokenistic Gender Responsive Budgeting (GRB).
- **Urban vs. Rural Governance:** Rural governance benefits from women's reservation in panchayats, but urban local bodies lack similar mandates, limiting women's representation.

Overview:

With India projected to have 800 million urban residents by 2050, gender equity in urban bureaucracy is critical for inclusive governance. The current male dominance in administrative roles overlooks women's lived experiences, impacting urban planning and service delivery.

Key Features/Details:

- **Gender Gap Statistics:** Women constitute 20% of IAS officers (2022) and 11.7% of police (2023), often relegated to desk roles.
- **Impact on Planning:** Low female representation limits focus on women's needs in slum rehabilitation, transport, and safety.
- **Gender Responsive Budgeting (GRB):** Adopted in 2005-06, GRB suffers from weak monitoring and limited capacity in smaller cities.
- **Challenges:** Poorly lit public spaces (60% as per Safetipin audit, 2019) and inadequate transport planning highlight the gender gap.
- **Global Best Practices:** Uganda's gender equity certificates, Tunisia's parity laws, and South Korea's gender impact assessments offer models for India.

Gender Equity in Urban Planning:

- **Women's Needs:** Urban planning must prioritize safe public transport, well-lit spaces, and childcare facilities to reflect women's experiences.
- **Policy Recommendations:** Mandatory gender audits, women-led planning councils, and scaling models like Kerala's Kudumbashree are essential.
- **Future Directions:** Integrating gender equity into the National Building Code and Eco Niwas Samhita will ensure inclusive urban development.

TRANSGENDER COUPLE RECOGNIZED AS GENDER-NEUTRAL PARENTS

Source: *The Indian Express, July 8, 2025; The Hindu, July 9, 2025*

UPSC Connection: Rights of Vulnerable Sections, Social Justice; Relevant for UPSC Prelims and Mains (GS Paper I – Society, GS Paper II – Governance)

Definition/Detailing:

In the Zahhad v. State of Kerala (2025) judgment, the Kerala High Court allowed a transgender couple to be listed as gender-neutral "parents" on their child's birth certificate, recognizing their self-identified genders. This ruling upholds the Transgender Persons (Protection of Rights) Act, 2019, and advances inclusive documentation practices for diverse family structures.

Comparison:

- **India vs. Global Practices:** Countries like Canada and New Zealand allow gender-neutral designations on official documents, but India's ruling is progressive in a conservative societal context.
- **Pre-2019 vs. Post-2019:** Before the 2019 Act, transgender rights were limited. The ruling builds on landmark judgments like NALSA (2014) and Navtej Singh Johar (2018).

Overview:

The Kerala High Court's ruling in Zahhad v. State of Kerala allows transgender parents Zahhad (trans man) and Ziya (trans woman) to be recognized as "parents" rather than "mother" and "father" on their child's birth certificate. The decision aligns with evolving societal norms and legal frameworks supporting transgender rights.

Key Features/Details:

- **Gender-Neutral Terminology:** The court permitted "parent" instead of gender-specific roles, respecting self-identified genders.
- **Legal Basis:** The ruling cites the Transgender Persons Act, 2019, and landmark judgments like NALSA (2014) and Navtej Singh Johar (2018).

- **Fundamental Rights:** The decision upholds dignity, privacy, and equality under Articles 14, 19, and 21.
- **Social Impact:** The verdict promotes inclusive documentation and acceptance of diverse family structures.
- **Precedent Setting:** It sets a model for other states to adopt gender-neutral policies.

UPSC Relevance:

Transgender Rights and Social Inclusion:

- **Historical Context:** The NALSA judgment (2014) was a turning point, recognizing transgender persons' right to self-identify.
- **Policy Gaps:** Limited access to education, employment, and healthcare for transgender individuals requires targeted interventions.
- **Future Directions:** Gender-neutral documentation should extend to other official records, supported by awareness campaigns.

ENABLING VOTING RIGHTS FOR MIGRANTS

Source: *The Indian Express, July 2, 2025; PIB, July 3, 2025*

UPSC Connection: Migration, Electoral Reforms; Relevant for UPSC Prelims and Mains (GS Paper II – Governance)

Definition/Detailing:

India's election rules restrict voting to home constituencies, disenfranchising many of the 37% of the population (Census 2011) who are migrants. This undermines universal adult franchise (UAF), particularly for inter-state and women migrants, necessitating reforms like Remote Voting Machines (RVMs) and postal ballots.

Comparison:

- **India vs. Global Practices:** Countries like Australia allow postal voting for migrants, while India's RVM pilot is still experimental.
- **Intra-State vs. Inter-State Migrants:** Intra-state migrants (85% of total) face fewer barriers than inter-state migrants due to shorter travel distances.

Overview:

Migrants, constituting 37% of India's population, face barriers to voting due to high travel costs, lack of paid leave, and registration issues. Proposed reforms aim to ensure inclusive voting through technological and administrative solutions.

Key Features/Details:

- **Migration Statistics:** 37% of India's population are migrants (Census 2011), with 68% being women, primarily migrating for marriage.
- **Barriers to Voting:** High costs, lack of paid leave, and absence of local address proof hinder migrant voting.
- **Proposed Solutions:** RVMs, postal ballots, constituency switching, and targeted registration drives for women migrants.
- **Challenges:** Administrative complexity, political concerns, and logistical issues in implementing RVMs and postal ballots.
- **Impact:** Inclusive voting strengthens UAF and ensures migrant voices in policy-making.

Electoral Inclusion for Migrants:

- **Feminization of Migration:** Women migrants, often unregistered post-marriage, need targeted voter drives.
- **Technological Solutions:** RVMs must address cybersecurity and accessibility concerns to be effective.
- **Policy Recommendations:** A national migrant voter registration framework and subsidized travel for voting could enhance participation.

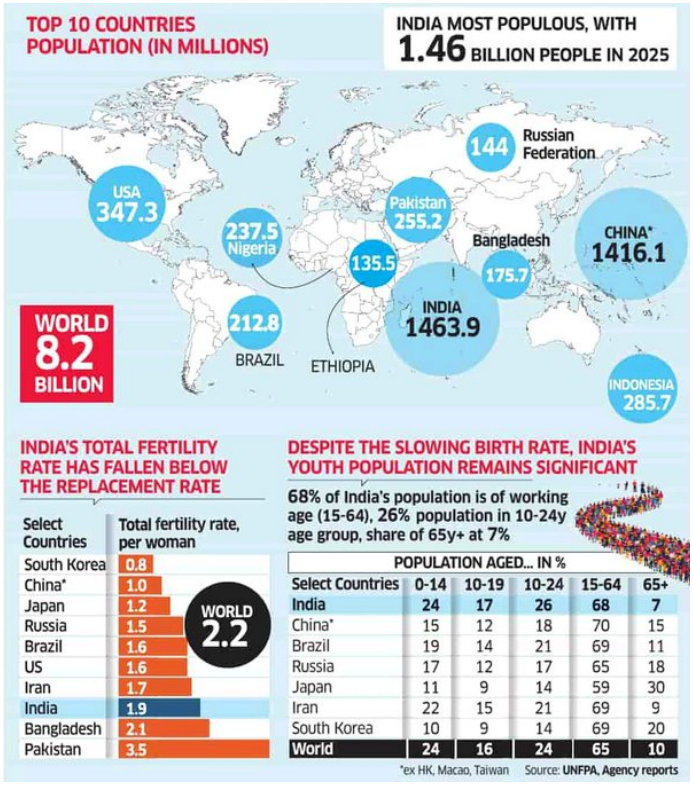
STATE OF WORLD POPULATION REPORT 2025: UNFPA

Source: *UNFPA Report, July 10, 2025; The Indian Express, July 11, 2025*

UPSC Connection: Population Issues, Social Development; Relevant for UPSC Prelims and Mains (GS Paper I – Society, GS Paper II – Governance)

Definition/Detailing:

The UNFPA's State of World Population Report 2025 highlights India's demographic transition, with a fertility rate of 1.9 (below replacement level) and a high demographic dividend (68% working-age population). It identifies unmet reproductive aspirations as a key challenge, emphasizing the need for reproductive agency.



Comparison:

- **India vs. Global Trends:** India's fertility rate (1.9) is lower than the global average (2.2), aligning with middle-income countries but lagging behind high-fertility regions like Sub-Saharan Africa.
- **NFHS-5 vs. UNFPA:** The report corroborates NFHS-5's finding of a 2.0 fertility rate, highlighting consistent demographic data.

Overview:

India, with 1.46 billion people, faces a "real fertility crisis" due to unmet reproductive goals, driven by economic insecurity, lack of workplace policies, and limited healthcare access. The report calls for a rights-based approach to enhance reproductive agency.

Key Features/Details:

- **Demographic Facts:** India's fertility rate is 1.9; 68% of the population is aged 15–64; population doubling time is 79 years.
- **Fertility Crisis:** 36% report unintended pregnancies, 30% face unfulfilled desires for children.
- **Challenges:** Economic insecurity, lack of workplace policies, and stigma around infertility hinder reproductive agency.
- **Recommendations:** Promote reversible contraception, expand healthcare access, and challenge societal stigma.
- **Global Context:** Over half of countries have fertility rates below 2.1, reflecting a global demographic shift.

Demographic Dividend and Policy Implications:

- **Opportunities:** India's working-age population supports economic growth, but skill development is essential.
- **Policy Recommendations:** Universal healthcare and gender-sensitive workplace policies will maximize the dividend.

- **Future Directions:** Integrating population policies with SDGs will ensure sustainable development.

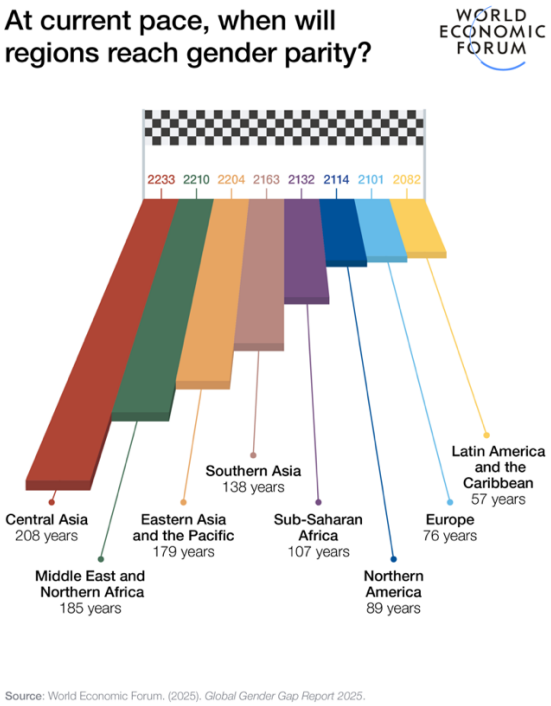
GLOBAL GENDER GAP INDEX 2025: WEF

Source: *WEF Report, July 9, 2025; The Hindu, July 10, 2025*

UPSC Connection: Women Empowerment, Social Development; Relevant for UPSC Prelims and Mains (GS Paper I – Society, GS Paper II – Governance)

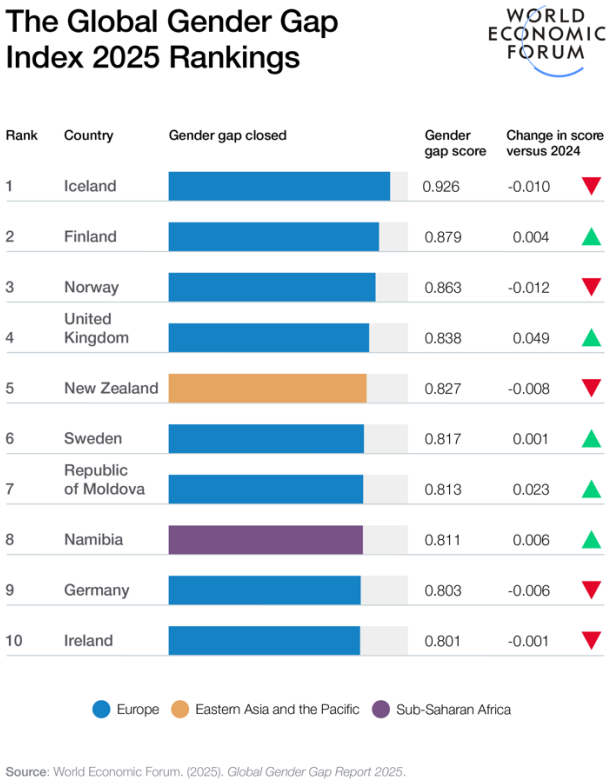
Definition/Detailing:

The WEF's Global Gender Gap Index 2025 ranks India 131 out of 148 countries, with a score of 64.1%, reflecting a decline in political empowerment. The index measures gender parity across economic participation, education, health, and political empowerment, highlighting persistent gaps in India's progress.



Comparison:

- **India vs. Global Leaders:** Iceland (top-ranked) has near-parity, while India lags significantly in political and economic domains.
- **2024 vs. 2025:** India's rank dropped from 129 to 131, primarily due to reduced political representation.



Overview:

India's gender gap score of 64.1% reflects progress in education (0.971) but significant gaps in economic participation (0.407) and political empowerment (0.245). The decline in women's representation in parliament and ministerial positions underscores the need for systemic reforms.

Key Features/Details:

- **Index Components:** Economic participation, educational attainment, health and survival, political empowerment.

Dimension	2025 Score (0-1)	2025 Rank	2024 Score (0-1)	2024 Rank	Change (2024 to 2025)
Overall Gender Gap Index	0.644	131	0.641	129	+0.003 (slight improvement, rank dropped)
Political Empowerment	0.245	69	0.251	65	-0.006 (decline)
Economic Participation and Opportunity	0.407	144	0.398	142	+0.009 (improvement)
Educational Attainment	0.971	110	0.964	112	+0.007 (improvement)
Health and Survival	0.954	143	0.951	142	+0.003 (slight improvement)

- **India's Performance:** Ranked 131, with major gaps in political empowerment (13.8% parliamentary representation) and economic participation (0.407 score).
- **Global Context:** Global gender gap is 68.8%; no country has achieved full parity.
- **Challenges:** Declining political representation and low economic participation hinder progress.
- **Recommendations:** Strengthen women's leadership and economic opportunities.

Gender Parity and Economic Growth:

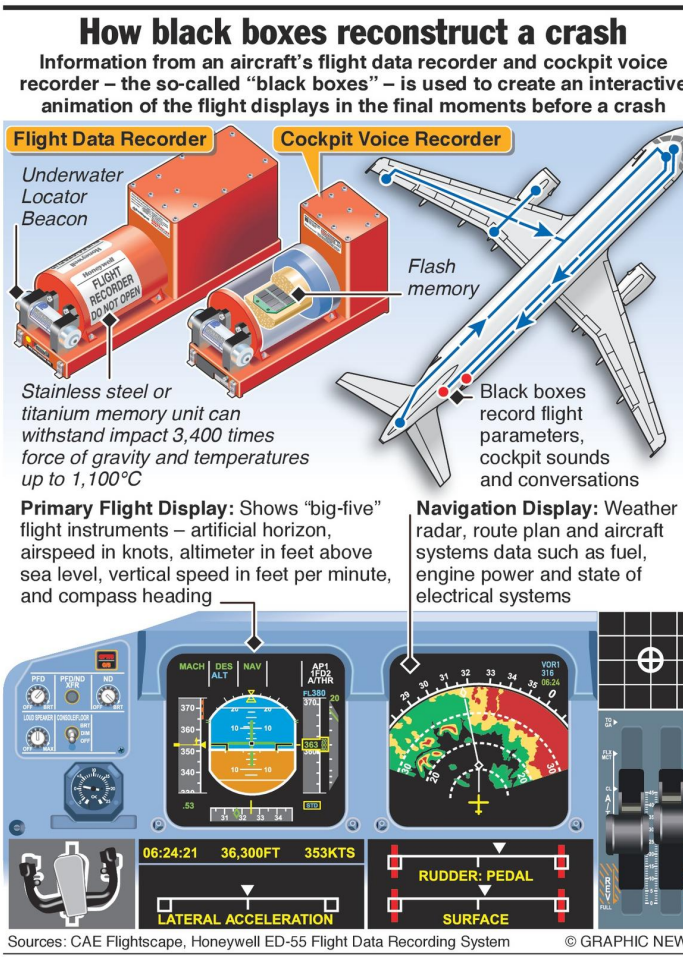
- **Economic Benefits:** Closing the gender gap boosts workforce participation and productivity.
- **Policy Recommendations:** Quotas for women in politics and targeted economic schemes are essential.
- **Future Directions:** Integrating gender parity into national development plans will ensure inclusive growth.

SCIENCE and TECHNOLOGY

BLACK BOX IN AIRCRAFT

Source: *The Times of India (July 12, 2025), The Hindu (July 13, 2025)*

UPSC Connection: Science and Technology, Disaster Management; Relevant for UPSC Prelims and Mains (GS3 – Science and Technology, Disaster Management).



Definition/Detailing:

The black box, comprising the Cockpit Voice Recorder (CVR) and Flight Data Recorder (FDR), is a critical flight recording device recovered from the Ahmedabad plane crash site. It records cockpit conversations and flight data to aid crash investigations.

Comparison:

- Compared to older data recorders, modern black boxes are more durable, using steel/titanium and underwater beacons.
- Unlike ground-based air traffic control data, black boxes provide direct, onboard evidence of crash causes.

Overview:

Black boxes are essential for aviation safety, enabling investigators to reconstruct crash events and improve safety protocols, as seen in the Ahmedabad crash investigation.

Key Features/Details:

- **Components**:

  CVR: Records radio transmissions, pilot conversations, and engine noises.

  FDR: Logs flight parameters like altitude, speed, and engine performance.

- **Design**: Orange-colored, made of steel/titanium, insulated against heat, cold, and water; placed at the aircraft's rear.
- **Underwater Capability**: Equipped with 30-day ultrasound beacons for water crashes.
- **Purpose**: Reconstructs crash events to determine causes.

Aviation Safety Impact:

- Black box analysis drives global aviation safety standards, contributing to India's efforts to modernize its aviation sector.

DNA IDENTIFICATION IN AIR INDIA PLANE CRASH

Source: *The Times of India (July 13, 2025), The Indian Express (July 14, 2025)*

UPSC Connection: Science and Technology, Disaster Management; Relevant for UPSC Prelims and Mains (GS3 – Science and Technology, Disaster Management).

Definition/Detailing:

Following an Air India Boeing 787 crash in Ahmedabad, DNA profiling was used to identify remains. Techniques like Short Tandem Repeat (STR), mitochondrial DNA (mtDNA), Y chromosome, and Single Nucleotide Polymorphisms (SNPs) analysis enable identification by comparing samples with relatives or personal items.

Comparison:

- Compared to traditional identification methods (e.g., fingerprints), DNA profiling is more reliable for degraded remains, especially in mass casualty events.
- Unlike STR analysis, which requires intact nuclear DNA, mtDNA and SNPs are effective for degraded samples, offering versatility.

Overview:

DNA identification is a critical forensic tool in disaster management, ensuring accurate identification of victims in events like plane crashes, where remains may be unrecognizable.

Key Features/Details:

- **Context**: Used post-Air India crash in Ahmedabad.
- **DNA Profiling**: Identifies individuals via unique DNA patterns; not applicable to identical twins.
- **Sample Collection**: Requires prompt collection; soft tissues degrade faster than bones/teeth; samples stored at -20°C or in 95% ethanol.
- **Methods**:

  STR Analysis: Uses short repeating DNA sequences; requires intact nuclear DNA.

  mtDNA Analysis: Uses mitochondrial DNA; effective for degraded samples; matches maternal relatives.

  Y Chromosome Analysis: Matches paternal relatives using Y chromosome STRs.

  SNPs Analysis: Uses single base variations; suitable for highly degraded DNA.
- **Reference Samples**: Collected from relatives or personal items (e.g., toothbrush).

Forensic Applications:

- DNA profiling is also used in criminal investigations and paternity disputes, showcasing its versatility in governance and justice systems.

SMALL SATELLITE LAUNCH VEHICLE (SSLV)

Source: *The Hindu (July 12, 2025), The Times of India (July 13, 2025)*

UPSC Connection: Space Technology, Economic Development; Relevant for UPSC Prelims and Mains (GS3 – Science and Technology, Economic Development).

Definition/Detailing:

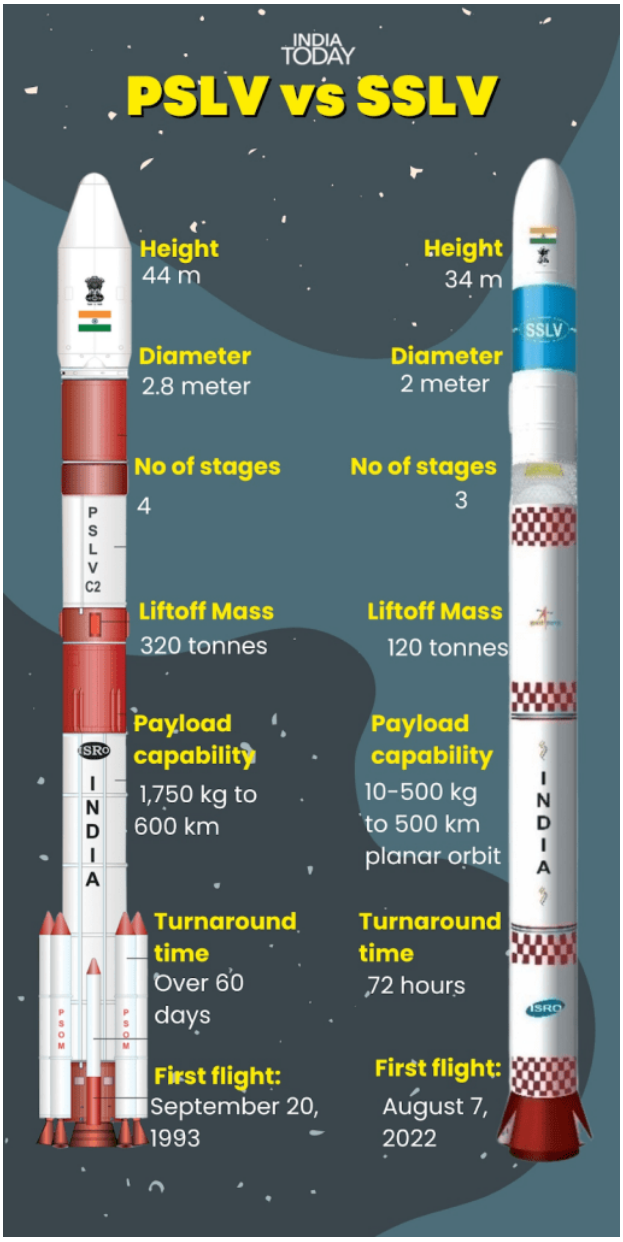
The Small Satellite Launch Vehicle (SSLV), developed by ISRO, is designed to launch mini, micro, and nanosatellites (10–500 kg) into Low Earth Orbit (LEO). Hindustan Aeronautics Limited (HAL) secured a ₹511 crore Transfer of Technology deal to commercialize SSLV launches through Indian industry partners.

Comparison:

- Compared to PSLV, SSLV is more cost-effective (1/10th the cost) and has a faster turnaround time (72 hours vs. 70 days).
- Unlike GSLV, which targets heavier payloads, SSLV caters to the growing demand for small satellite launches.

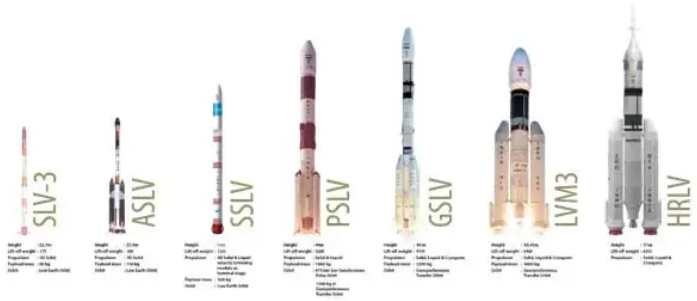
Overview:

SSLV addresses the global demand for affordable, rapid small satellite launches, enhancing India's competitiveness in the commercial space market and supporting its space economy ambitions.



Key Features/Details:

- **Design**: Three-stage vehicle with solid fuel propulsion stages and a liquid propulsion Velocity Trimming Module (VTM).
- **Capacity**: Launches 10–500 kg satellites to 500 km LEO; supports multiple orbital drop-offs.



- **Advantages**:

  Cost-effective (1/10th of PSLV).

  Rapid turnaround (72 hours).

  Launch-on-demand and ridesharing capabilities.

  Minimal infrastructure requirements.

- **Commercialization**: Managed by New Space India Limited (NSIL) with industry partners like HAL.

Space Economy Impact:

- SSLV's commercialization can position India as a leader in the small satellite launch market, supporting applications like communication, earth observation, and scientific research.

SATELLITE RACE IN ULTRA LOW EARTH ORBIT (ULEO)

Source: *The Indian Express (July 13, 2025), The Hindu (July 14, 2025)*

UPSC Connection: Space Technology, Security; Relevant for UPSC Prelims and Mains (GS3 – Science and Technology, Security).

Definition/Detailing:

Orbit Space, an Indian startup, is developing satellite propulsion systems for Ultra Low Earth Orbit (ULEO, <450 km) missions, which offer high-resolution imagery and low-latency communication. ULEO satellites use electric propulsion to counter atmospheric drag, leveraging residual gases as propellant.

Comparison:

- Compared to LEO (500–2,000 km), ULEO offers higher resolution and lower latency but faces challenges like high drag and atomic oxygen corrosion.
- Unlike traditional chemical propulsion, electric propulsion eliminates onboard fuel needs, extending satellite lifespan.

Overview:

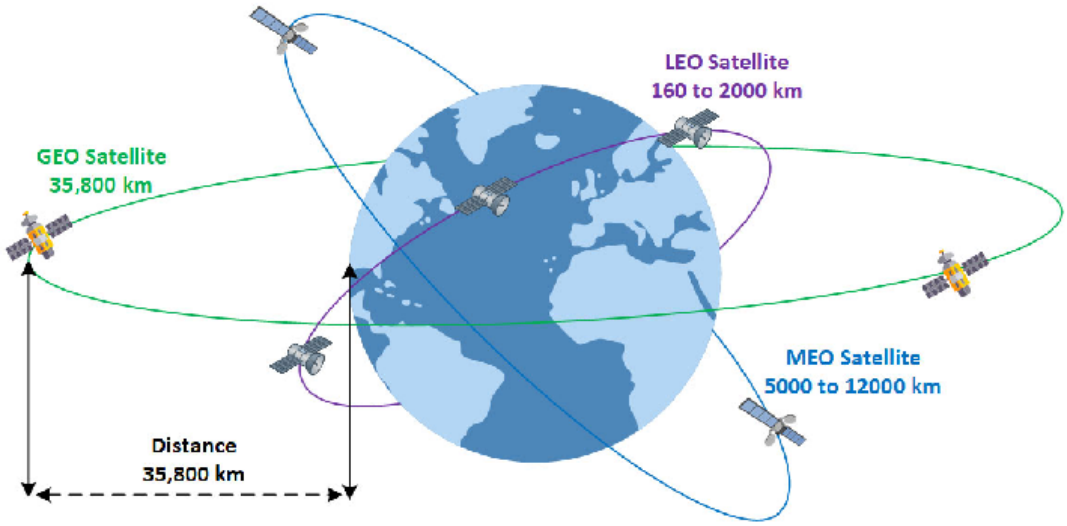
ULEO missions represent the next frontier in satellite technology, with applications in earth observation, telecommunications, and climate monitoring, enhancing India's space capabilities and security.

Key Features/Details:

- **ULEO Definition**: Orbits below 450 km, sometimes <200 km.
- **Applications**: Earth observation, low-latency telecom, climate monitoring, surveillance, rural internet.
- **Benefits**
- Higher resolution imagery and reduced communication latency.
- Self-regulating debris solution (natural de-orbiting).
- Radiation protection for cost-effective electronics.
- **Challenges:**
- High atmospheric drag requiring constant thrust.
- High operational costs and fuel constraints.
- Atomic oxygen corrosion necessitating special coatings.
- **Innovation**: Orbit Space's electric propulsion uses atmospheric gases, extending satellite life to 5–7 years.

Strategic Implications:

- ULEO satellites enhance India's capabilities in disaster management, border surveillance, and climate monitoring, strengthening national security and resilience.



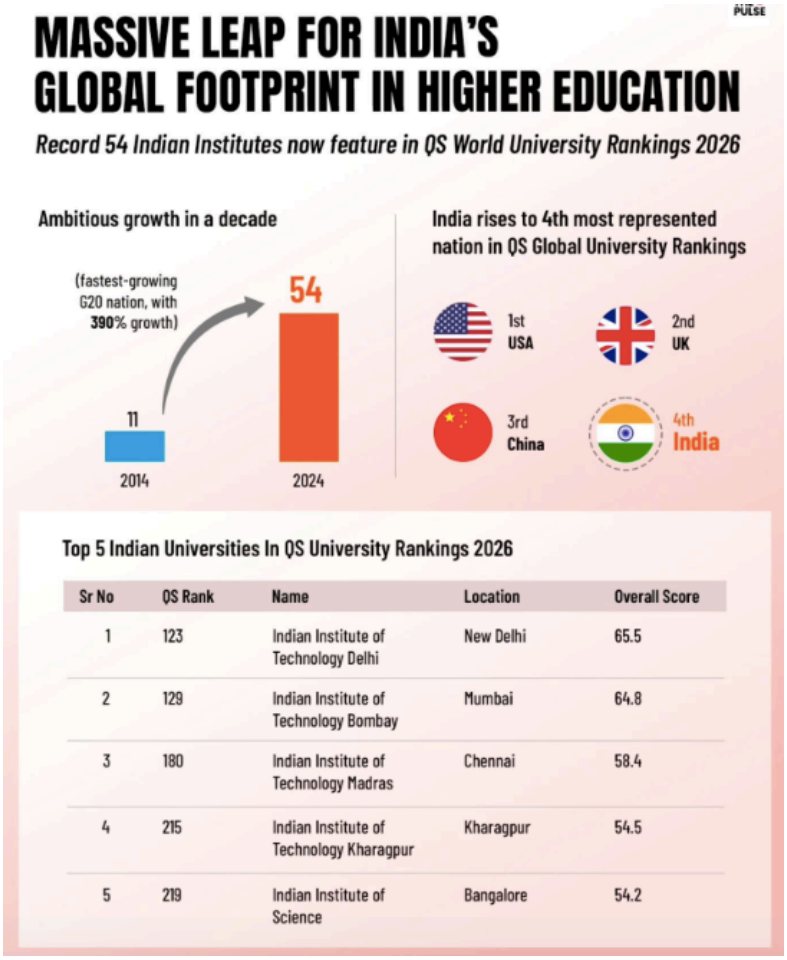
QS WORLD UNIVERSITY RANKINGS 2026

Source: *The Times of India, July 5, 2025; PIB, July 6, 2025*

UPSC Connection: Education, Human Development; Relevant for UPSC Prelims and Mains (GS Paper II – Governance, GS Paper III – Economy)

Definition/Detailing:

The QS World University Rankings 2026 feature 54 Indian institutions, with IIT Delhi (123rd) leading, reflecting India's growing higher education system. Challenges like low international student diversity and faculty shortages highlight areas for improvement.



Sr No	QS Rank	Name	Location	Overall Score
1	123	Indian Institute of Technology Delhi	New Delhi	65.5
2	129	Indian Institute of Technology Bombay	Mumbai	64.8
3	180	Indian Institute of Technology Madras	Chennai	58.4
4	215	Indian Institute of Technology Kharagpur	Kharagpur	54.5
5	219	Indian Institute of Science	Bangalore	54.2

Comparison:

- **India vs. Global Leaders:** The US and UK dominate rankings due to international diversity, while India lags in this metric.
- **2015 vs. 2026:** India's representation grew from 11 to 54 institutions, showcasing rapid progress.

Overview:

India's 54 universities in the QS Rankings 2026 mark its strongest performance, with six in the global top 250. However, challenges in international student ratio and faculty resources limit global competitiveness.

Key Features/Details:

- **India's Performance:** 54 universities, with IIT Delhi (123rd), IIT Bombay, and IIT Madras leading.
- **Growth:** From 11 institutions in 2015 to 54 in 2026, making India the fourth most represented country.
- **Challenges:** 78% of universities saw declines in international student ratio; none rank in the top 500 for this metric.
- **Ranking Criteria:** Academic reputation, citations, faculty-student ratio, and international diversity.
- **Significance:** Reflects India's growing higher education system, critical for human capital development.

Higher Education and Global Competitiveness:

- **NEP 2020:** Aims to increase GER and promote international collaboration.
- **Policy Recommendations:** Incentives for international students and faculty recruitment are essential.
- **Future Directions:** Aligning education with industry needs will enhance employability.

STEP-AND-SHOOT SPOT-SCANNING PROTON ARC THERAPY (SPARC)

Source: *The Hindu (July 12, 2025), The Indian Express (July 13, 2025)*

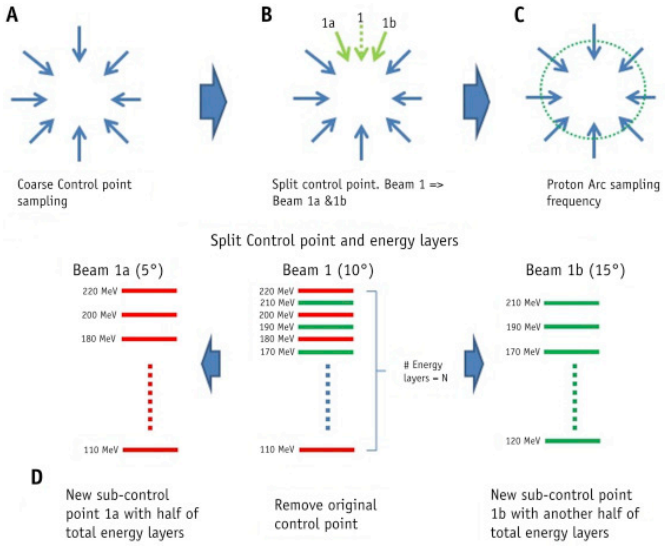
UPSC Connection: Health, Science and Technology; Relevant for UPSC Prelims and Mains (GS3 – Health, Science and Technology).

Definition/Detailing:

SPArc, an advanced radiation therapy, was used to treat adenoid cystic carcinoma by delivering precise proton beams to tumors while minimizing damage to surrounding tissues. It reduces radiation exposure compared to standard proton therapy (SFO-IMPT).

Comparison:

- Compared to traditional radiation therapy, SPArc offers greater precision, reducing collateral damage to sensitive areas like the brainstem.
- Unlike chemotherapy, which affects both cancerous and healthy cells, SPArc targets tumors specifically, improving patient outcomes.



Overview:

SPArc represents a breakthrough in cancer treatment, offering precise, low-risk radiation therapy for tumors in sensitive areas, though its high cost limits accessibility.

Key Features/Details:

- **Application**: Used for adenoid cystic carcinoma; targets tumors with proton beams.
- **Mechanism**: Scans all possible spots and energy layers; delivers radiation layer-by-layer.
- **Advantages**: Reduces radiation to brainstem (10%), optical chiasm (56%), oral cavity (72%), spinal canal (90%) compared to SFO-IMPT.
- **Challenges:** Expensive; under development; suitable for a small patient population.

Health Equity Challenges:

- Bridging the gap between advanced treatments and affordability is critical for India's healthcare system, requiring public-private partnerships and international collaboration.

INDIA AMONG TOP SIX IN 6G PATENT FILINGS

Source: *The Hindu (July 12, 2025),*

UPSC Connection: S & T, Economic Development; Relevant for UPSC Prelims and Mains (GS3 – S&T, Economic Development).

Definition/Detailing:

India ranks among top six globally in 6G patent filings, with over 111 research projects funded at ₹300 crore. 6G, expected by 2030, will offer ultra-fast speeds, low latency, and AI-driven applications, revolutionizing connectivity.

Parameter	5G	6G
Deployment Timeline	Began global commercial rollout around 2020, with India launching 5G services in 2022 under initiatives like Digital India.	Expected to roll out globally around 2030, currently in the research and development (R&D) phase, with India investing in 6G R&D through the Bharat 6G Vision.
Objective & Vision	Aims to provide high-speed, low-latency connectivity to support smart cities, e-governance, and digital economy growth.	Envisions an "Internet of Everything," integrating humans, machines, and environments with ultra-fast, intelligent, and secure networks.
Speed & Latency	Offers peak data speeds up to 10 Gbps and latency as low as 1 millisecond, enabling real-time applications like autonomous vehicles and telemedicine.	Projected to be 100 times faster, with speeds up to 1 Tbps and latency below 0.1 milliseconds, supporting near-instantaneous communication for futuristic applications.
Frequency & Spectrum	Utilizes sub-6 GHz and millimeter wave (mmWave) bands (up to 100 GHz), requiring significant infrastructure upgrades.	Operates in Terahertz (THz) bands (100 GHz to 10 THz), enabling massive data capacity but necessitating advanced infrastructure due to short-range signals and high signal loss.
Connectivity Density	Supports up to 1 million devices per square kilometer, facilitating IoT applications like smart grids and urban management.	Aims to connect over 10 million devices per square kilometer, enabling hyper-connected ecosystems for smart agriculture, urban planning, and disaster management.
Applications & Use Cases	Powers smart cities, high-speed broadband, autonomous vehicles, remote healthcare, and industrial automation. In India, 5G supports initiatives like Smart Cities Mission and e-governance platforms.	Will enable immersive technologies like holographic communication, digital twins, tactile internet, precision agriculture, and space-terrestrial communication, with applications in India's space program and rural connectivity.
AI/ML Integration	Uses AI and ML externally for network optimization, traffic management, and fault detection, with human oversight for decision-making (e.g., predicting network congestion).	Embeds AI and ML natively into the network architecture, enabling autonomous decision-making for routing, security, and fault repair (e.g., instant detection and isolation of cyberattacks).
Security & Privacy	Employs advanced encryption and network segmentation for improved cybersecurity, critical for e-governance and digital payments in India.	Introduces quantum-resistant cryptography, zero-trust architecture, and enhanced privacy measures to address emerging threats, vital for digital identity and national security.

Comparison:

- Compared to 5G, 6G offers 100x faster speeds and lower latency, enabling advanced applications like holographic communication.
- Unlike 5G, 6G integrates AI natively, enhancing real-time decision-making and security.

Overview:

India's leadership in 6G patents reflects its growing technological prowess, with potential economic impacts of ₹85.37 lakh crore by 2035, driven by innovations in telecom and AI.

Key Features/Details:

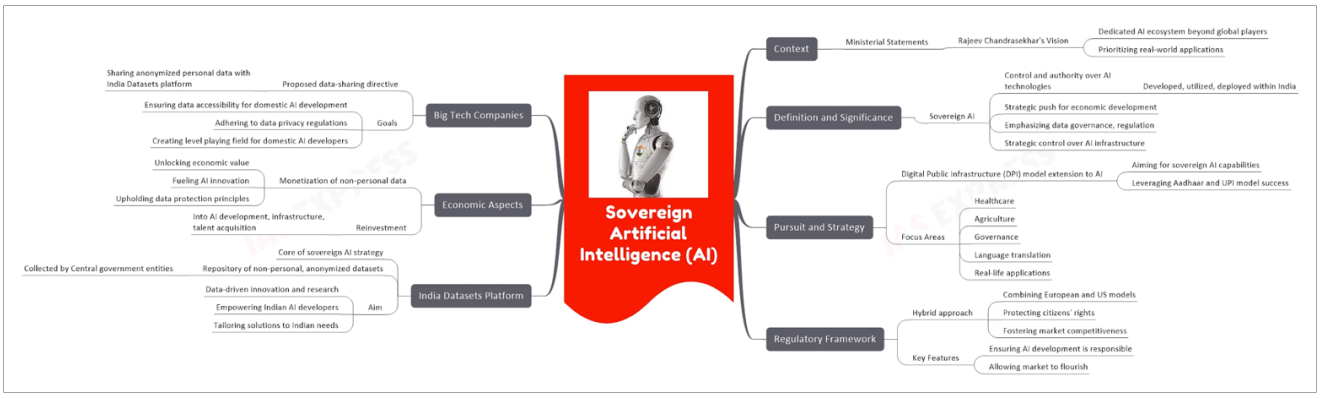
- **6G Features**: Speeds up to 1 Tbps, latency <0.1 ms, operates in terahertz bands, supports 10 million devices/sq. km.
- **India's Progress**: Second-largest telecom market; 974 million internet subscribers; cheapest data rates globally.
- **Patent Filings**: Among top six globally; Bharat 6G Alliance targets 10% of global 6G patents.

Economic Impact:

- 6G's adoption could transform sectors like agriculture, healthcare, and governance, positioning India as a global tech leader.

INDIA'S DOMESTIC AI FOUNDATIONAL MODEL

Source: *The Times of India (July 14, 2025), The Hindu (July 15, 2025)*



UPSC Connection: Science and Technology, Security; Relevant for UPSC Prelims and Mains (GS3 – Science and Technology, Security).

Definition/Detailing:

Under the India AI Mission, startups like Sarvam AI, SoketAI, Gnani AI, and Gan AI are developing indigenous AI foundational models, including a 120-billion-parameter large language model (LLM) to reduce reliance on foreign models and enhance security.

Comparison:

- Compared to global LLMs like ChatGPT, India's models aim to incorporate local nuances and reduce biases.
- Unlike small language models (SLMs), LLMs require significant computational resources but offer broader applications.

Overview:

India's push for indigenous AI models addresses security, cultural relevance, and economic self-reliance, aiming to build a robust AI ecosystem by 2025.

Key Features/Details:

- **Initiative**: India AI Mission; Sarvam AI leading a 120-billion-parameter LLM
- **Models**: Sarvam-1 (2 billion parameters), Sarvam-M (24 billion parameters).
- **Challenges:** Requires GPU clusters, high-performance computing, and large datasets.
- **Need**: Avoids foreign biases and security risks in defense and governance applications.

Strategic Importance:

- Indigenous AI models ensure data sovereignty and security, critical for India's digital transformation.

INDIAN ASTRONAUT PILOTS AXIOM-4 MISSION

Source: *The Hindu (July 12, 2025), The Indian Express (July 13, 2025)*

UPSC Connection: Space Technology, International Cooperation; Relevant for UPSC Prelims and Mains (GS3 – Science and Technology, International Relations).

Definition/Detailing:

The Axiom-4 Mission, a private spaceflight to the International Space Station (ISS), was launched in June 2025 for a 14-day mission involving scientific research, outreach, and commercial activities. Indian Air Force officer and ISRO astronaut Shubhanshu Shukla piloted the mission, marking a significant milestone for India's space program.

Comparison:

- Compared to ISRO's Gaganyaan mission, Axiom-4 is a private endeavor operated by Axiom Space, highlighting the growing role of private entities in space exploration.
- Unlike Rakesh Sharma's 1984 mission (government-led), Axiom-4 showcases India's participation in commercial space ventures.

Overview:

The Axiom-4 Mission underscores India's advancing space capabilities and international collaboration in space exploration. Shubhanshu Shukla's role highlights India's growing expertise in human spaceflight, aligning with its ambitions for the Gaganyaan mission.

Key Features/Details:

- **Mission Details**: 14-day private spaceflight to ISS; operated by Axiom Space using SpaceX's Crew Dragon spacecraft and Falcon 9 rocket; launched from NASA's Kennedy Space Center, Florida.
- **Crew**: Shubhanshu Shukla and three other astronauts; focus on science, outreach, and commercial activities.
- **Experiments**: Seven microgravity research experiments by Shukla, including:

  Impact of microgravity radiation on edible micro-algae.

  Sprouting salad seeds in space.

  Survival, revival, reproduction, and transcriptome analysis of tardigrades.

- **Delay**: Originally planned for May 2025, delayed due to a liquid oxygen (LOX) leak in the booster and leaks in the ISS's Russian module.
- **Significance:** Shukla is the first Indian to visit the ISS on a private mission and the second Indian in space after Rakesh Sharma (1984); he is also part of the Gaganyaan mission.

Global Space Collaboration:

- India's involvement in Axiom-4 strengthens its position in global space exploration, fostering partnerships with private entities and aligning with initiatives like the Artemis Accords.

DRONE WARFARE AND INDIA

Source: *The Indian Express (July 14, 2025), The Hindu (July 15, 2025)*

UPSC Connection: Defence Technology, Security; Relevant for UPSC Prelims and Mains (GS3 – Science and Technology, Security).

Definition/Detailing:

Drone warfare, exemplified by Ukraine's Operation Spider's Web and India-Pakistan hostilities, involves autonomous swarm drones for intelligence, surveillance, and attacks. India has developed layered counter-drone systems like Akashteer, Bhargavastra, and Indrajaal to address this growing threat.

Comparison:

- Compared to traditional air forces, swarm drones are low-cost and harder to intercept, offering asymmetric warfare advantages.
- Unlike missile-based defenses, counter-drone systems like lasers and jammers are more cost-effective against swarms.

Overview:

The rise of drone warfare transforms modern battlefields, necessitating advanced counter-drone technologies. India's robust infrastructure reflects its preparedness for this evolving threat.

Key Features/Details:

- **Global Context**: Drone market projected to grow from $14.14 billion (2023) to $47.16 billion (2032); Ukraine's 2025 attack damaged 40+ Russian aircraft.
- **Swarm Drones**: Autonomous, coordinated UAVs; resilient due to redundancy; used for saturating defenses and targeting high-value assets.
- **Threats**: Low cost, high impact; difficult to intercept; agile and mobile.
- **Countermeasures**:

  Detection: AESA radars, electro-optical/infrared sensors, acoustic detectors, AI fusion systems.

  Neutralization: Missiles, automated guns (C-RAM, Phalanx), directed energy weapons, jammers, spoofing, cyber attacks, interceptor drones.
- **India's Systems**:

  Akashteer: Integrates with IAF's command network.

  Bhargavastra: Fires 64 micro-rockets for swarm elimination.

  DRDO Anti-Drone System: 360° radar, jamming, and laser capabilities.

  Indrajaal: AI-powered grid protecting up to 4,000 sq. km.

Strategic Implications:

- Drone warfare underscores the need for India to integrate AI and cyber capabilities into its defense strategy, ensuring resilience against asymmetric threats.

HEAVIEST PROTON EMITTER ASTATINE-188 DETECTED

Source: *The Times of India (July 13, 2025), The Hindu (July 14, 2025)*

UPSC Connection: Nuclear Technology, Health; Relevant for UPSC Prelims and Mains (GS3 – Science and Technology, Health).

Definition/Detailing:

Researchers detected proton emission from Astatine-188 (At-188), the heaviest known proton emitter, with a half-life of 190 microseconds. Astatine isotopes, particularly Astatine-211, show promise in Targeted Alpha Therapy (TAT) for cancer treatment.

Comparison:

- Compared to alpha or beta decay, proton emission is rare, making At-188's detection significant for nuclear physics.
- Unlike conventional radiation therapy, TAT using Astatine-211 offers targeted cancer cell destruction with minimal damage to healthy tissues.

Overview:

The discovery of At-188's proton emission advances nuclear physics and medical applications, particularly in cancer treatment, highlighting India's growing role in cutting-edge research.

Key Features/Details:

- **Atom Basics**: Nucleus contains protons (atomic number) and neutrons; total nucleons = atomic mass number.
- **Radioactivity**: Elements with atomic number >83 (e.g., Astatine, Uranium) are radioactive, decaying via alpha, beta, or gamma radiation.
- **At-188**: Decays by proton emission to Polonium-187, then alpha decay to Lead-183; half-life of 190 microseconds.
- **TAT**: Uses alpha-emitting isotopes like Astatine-211 to target cancer cells.

UPSC Relevance:

Medical Applications:

- Astatine-based TAT could revolutionize cancer treatment, positioning India as a leader in nuclear medicine.

ARTIFICIAL NANOZYME TO PREVENT ABNORMAL BLOOD CLOTS

Source: *The Times of India (July 13, 2025), The Hindu (July 14, 2025)*

UPSC Connection: Health, Nanotechnology; Relevant for UPSC Prelims and Mains (GS3 – Health, Science and Technology).

Definition/Detailing:

Researchers at the Indian Institute of Science developed a vanadium pentoxide (V2O5) nanozyme that mimics antioxidant enzymes to reduce reactive oxygen species (ROS), preventing abnormal blood clotting in conditions like pulmonary thromboembolism (PTE).

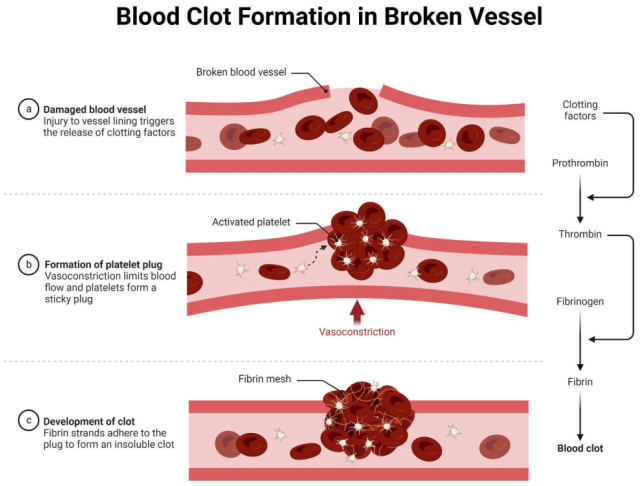
Comparison:

- Compared to traditional anticoagulants, nanozymes offer targeted action with fewer side effects.
- Unlike natural enzymes, artificial nanozymes are more stable and scalable for medical applications.

Overview:

The nanozyme addresses thrombosis by controlling ROS levels, offering a novel

approach to managing life-threatening conditions like PTE and COVID-19-related clotting.



Key Features/Details:

- **Nanozyme**: Spherical V2O5 mimics antioxidant enzymes; scavenges ROS to prevent platelet over-activation.
- **Conditions**: Targets PTE, COVID-19-related thrombosis.
- **Mechanism**: Reduces oxidative stress, preventing excess clot formation.

Nanotechnology Potential:

- Nanozymes could revolutionize treatment for various oxidative stress-related diseases, positioning India as a leader in nanomedicine.

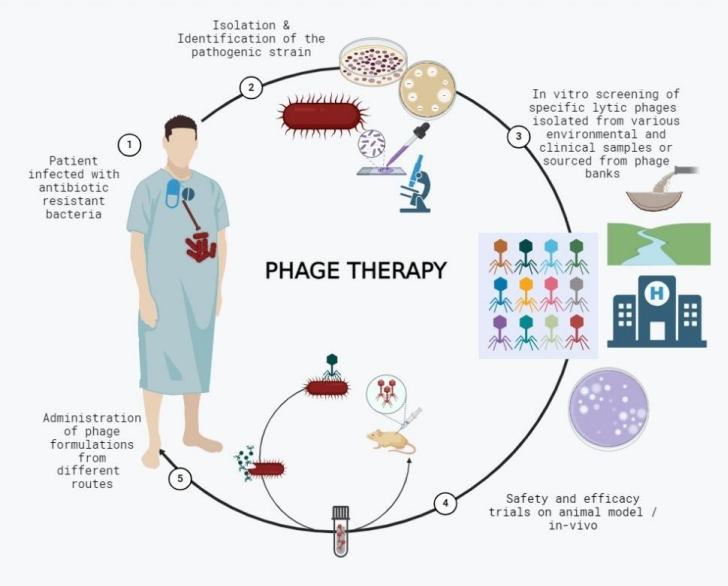
BACTERIOPHAGES TO COMBAT ANTIMICROBIAL RESISTANCE

Source: *The Times of India (July 14, 2025), The Hindu (July 15, 2025)*

UPSC Connection: Health, Science and Technology; Relevant for UPSC Prelims and Mains (GS3 – Health, Science and Technology).

Definition/Detailing:

Bacteriophages, viruses that attack bacteria, are being explored as an alternative to antibiotics to combat antimicrobial resistance (AMR), a global health threat causing 5 million deaths annually. Phage therapy includes natural and genetically engineered approaches.



Comparison:

- Unlike antibiotics, which target multiple bacteria, phages are highly specific, requiring precise matching to bacterial strains.
- Compared to traditional antibiotics, phages can evolve to counter bacterial resistance, offering a dynamic solution.

Overview:

With AMR rendering standard treatments ineffective, bacteriophages offer a promising alternative, though challenges like specificity and regulatory hurdles remain.

Key Features/Details:

- **AMR**: Microorganisms resist antimicrobial drugs, creating "superbugs"; 5 million deaths annually (WHO).
- **Bacteriophages**: Viruses that target bacteria; ubiquitous in nature.
- **Therapeutic Uses**: Treat burns, foot ulcers, gut/respiratory/urinary infections.

  Natural Phage Therapy: Matches phages to specific bacteria.

  Genetically Engineered Phages: Target broader bacterial strains.
- **Challenges:** Narrow range, regulatory issues due to evolving nature of phages.

Global Health Implications:

- Phage therapy could reduce reliance on antibiotics, preserving their efficacy and addressing a critical public health challenge.

VOYAGER TARDIGRADES EXPERIMENT

Source: *The Indian Express (July 13, 2025), The Times of India (July 14, 2025)*

UPSC Connection: Space Technology, Biotechnology; Relevant for UPSC Prelims and Mains (GS3 – Science and Technology).

Definition/Detailing:

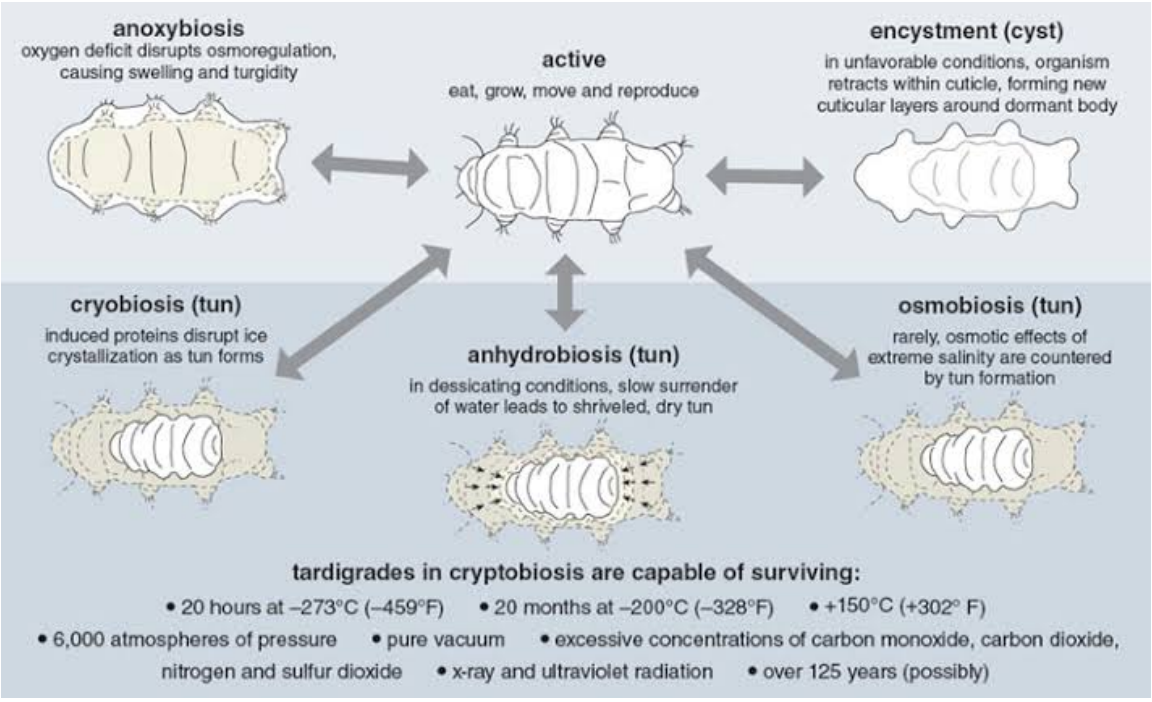
The Voyager Tardigrades Experiment, conducted by Shubhanshu Shukla during the Axiom-4 Mission, studies the survival, revival, and reproduction of tardigrades (microscopic water bears) under space radiation and microgravity. The experiment aims to identify genes responsible for their resilience to enhance astronaut protection in long-duration space missions.

Comparison:

- Compared to the 2007 Foton-M3 mission by ESA, which confirmed tardigrades' survival in space, the Voyager experiment focuses on genetic analysis for practical applications in human spaceflight.
- Unlike terrestrial studies, space-based tardigrade research provides insights into extreme environment adaptability.

Overview:

The experiment highlights tardigrades' unique resilience, offering potential solutions for



protecting biological materials and astronauts in space, contributing to India's growing expertise in space biotechnology.

Key Features/Details:

- **Objective**: Study tardigrades' response to space radiation and microgravity; identify resilience genes for astronaut protection.
- **Tardigrade Resilience**:

  Cryptobiosis: Near-complete metabolic standstill under adverse conditions.

  Anhydrobiosis: Reduces metabolism to <0.01% and water content by >95%, forming a durable "tun" state.

  CAHS Proteins: Form a gel-like matrix to protect cellular components from extreme temperatures, radiation, and space vacuum.
- **Previous Study**: ESA's 2007 Foton-M3 mission showed tardigrades survived space vacuum and UV exposure, with some reproducing post-mission.

Space Biotechnology Potential:

- Insights from tardigrades could lead to breakthroughs in radiation protection, benefiting deep-space missions like Gaganyaan and future lunar exploration.

THERMOPHILE BACTERIA IN RAJGIR HOT SPRING

Source: *The Indian Express (July 13, 2025), The Hindu (July 14, 2025)*

UPSC Connection: Environment, Biotechnology; Relevant for UPSC Prelims and Mains (GS3 – Environment, Science and Technology).

Definition/Detailing:

Thermophile bacteria, thriving in extreme temperatures (45°C–70°C), were identified in Rajgir hot spring, Bihar, particularly Actinobacteria, which produce antibiotics like streptomycin. These bacteria offer solutions to AMR and have applications in diagnostics and agriculture.

Comparison:

- Compared to mesophilic bacteria, thermophiles are uniquely suited for extreme environments, making their antibiotics more stable.
- Unlike synthetic antibiotics, thermophile-derived antibiotics are naturally produced, potentially reducing side effects.

Overview:

The discovery of antibiotic-producing thermophiles in Rajgir highlights their potential in combating AMR, diagnostics, and sustainable agriculture, showcasing India's microbial biodiversity.

Key Features/Details:

- **Thermophiles**: Heat-loving bacteria thriving in hot springs, deep-sea vents, compost piles.
- **Findings**: Actinobacteria (40–43% of microbial diversity in Rajgir) produce antibiotics effective against pathogens like E. coli, Salmonella, and Staphylococcus.
- **Applications**: Antibiotics for AMR, enzymes for PCR testing, biofertilizers for plant growth.

Biotechnology Potential:

- Thermophiles' heat-resistant enzymes and antibiotics can revolutionize diagnostics and sustainable agriculture, aligning with India's biotech ambitions.

BHARAT BIOTECH AND GSK SHIGELLA VACCINE

Source: The Times of India (July 12, 2025), The Hindu (July 13, 2025)

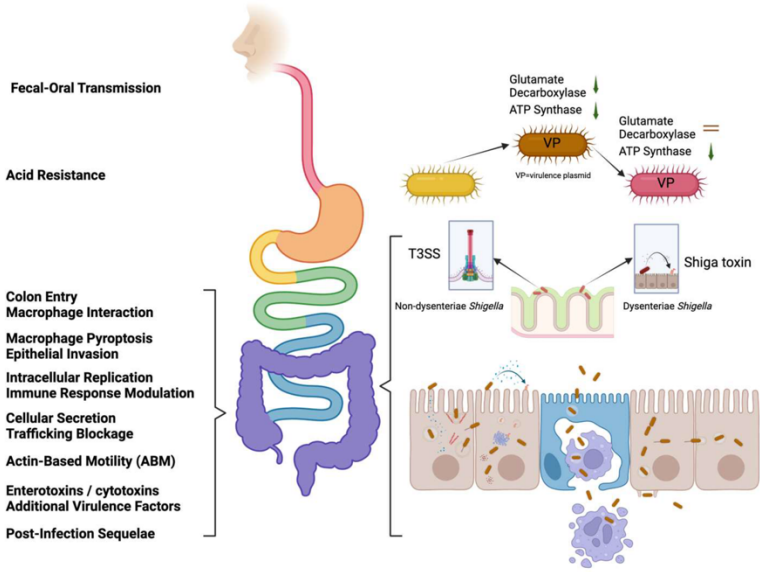
UPSC Connection: Health, Science and Technology; Relevant for UPSC Prelims and Mains (GS3 – Health, Science and Technology).

Definition/Detailing:

Bharat Biotech and GSK are collaborating to develop a Shigella vaccine (altSonflex1-2-3) using GMMA technology, targeting shigellosis, a major cause of diarrhea in children under five in low-income countries.

Comparison:

- Compared to traditional vaccines, GMMA-based vaccines are more cost-effective and scalable, ideal for low-income settings.
- Unlike oral rehydration therapy, the Shigella vaccine prevents infection, addressing a root cause of child mortality.



Overview:

The Shigella vaccine initiative aims to reduce child mortality in low-income countries, leveraging innovative GMMA technology for affordable, effective immunization.

Key Features/Details:

- **Shigella**: Bacteria causing shigellosis; transmitted via contaminated food/water; symptoms include diarrhea, fever, stomach pain.
- **Vaccine**: altSonflex1-2-3 uses GMMA technology (outer membrane vesicles) to deliver antigens.
- **Significance:** Targets low-income countries; addresses AMR in Shigella strains.

Global Health Impact:

- The vaccine could save millions of lives in developing countries, strengthening India's position as a global health leader.

MEASLES-RUBELLA ELIMINATION CAMPAIGN 2025-26

Source: *The Indian Express (July 14, 2025), The Hindu (July 15, 2025)*

UPSC Connection: Health, Public Policy; Relevant for UPSC Prelims and Mains (GS2 – Health, Governance).

Definition/Detailing:

The Ministry of Health and Family Welfare launched the National Zero Measles-Rubella Elimination Campaign 2025-26, aiming for 100% immunization coverage to eliminate these diseases by 2026, building on India's success with polio and tetanus elimination.

Comparison:

- Compared to polio elimination, measles-rubella elimination requires broader coverage due to higher contagiousness.
- Unlike smallpox, which was eradicated globally, measles and rubella persist due to vaccine hesitancy and coverage gaps.

Overview:

The campaign aims to achieve zero measles and rubella cases through universal

vaccination, leveraging India's robust immunization infrastructure to protect children and pregnant women.

Key Features/Details:

- **Campaign**: Targets 100% coverage with two doses of Measles-Rubella (MR) vaccine at 9–12 months and 16–24 months.
- **Current Coverage**: Over 90% under Universal Immunization Programme.
- **Measles**: Highly contagious; symptoms include fever, rash, pneumonia; 5–10% fatality rate.
- **Rubella**: Causes mild symptoms but risks Congenital Rubella Syndrome in pregnant women.

Public Health Significance:

- The campaign builds on India's immunization successes, reinforcing its leadership in global health initiatives.

HISTORY, ART & CULTURE

LEGAL DISPUTE OVER TOMB OF SHEIKH MUHAMMAD GHAUS

Source: *The Times of India (July 14, 2025), The Hindu (July 15, 2025)*

UPSC Connection: Medieval History, Cultural Heritage; Relevant for UPSC Prelims and Mains (GS1 – History, Culture).

Definition/Detailing:

The Madhya Pradesh High Court rejected a plea to allow religious practices at the tomb of Sufi saint Sheikh Muhammad Ghaus in Gwalior, a Centrally Protected Monument, citing risks to its preservation. The tomb, an early example of Mughal funerary architecture, is maintained by the ASI.

Comparison:

- Compared to other Mughal monuments like the Taj Mahal, the Ghaus tomb reflects regional architectural influences from Gujarat and Rajasthan.
- Unlike active religious sites, its status as a protected monument prioritizes preservation over religious use.

Overview:

The legal dispute highlights the balance between cultural heritage preservation and religious practices, underscoring the importance of protecting India's historical monuments.

Key Features/Details:

- **Sheikh Muhammad Ghaus**: 16th-century Sufi saint of the Shattari Order; aided Babur's conquest of Gwalior (1526); teacher to Humayun.

- **Tomb**: Built in Gwalior post-1563; early Mughal funerary architecture with Gujarat/Rajasthan influences; houses Tansen's grave.
- **Legal Ruling**: High Court prohibited religious practices to preserve monument's originality; maintained by ASI under AMASR Act, 1958.

Heritage Preservation:

- The case underscores the need for robust legal frameworks to protect India's cultural heritage while respecting religious diversity.

ANNUAL RATH YATRA IN PURI

Source: *The Hindu (July 13, 2025), The Indian Express (July 14, 2025)*

UPSC Connection: Cultural Heritage, Temple Architecture; Relevant for UPSC Prelims and Mains (GS1 – Culture).

Definition/Detailing:

The Rath Yatra, held annually in Puri, Odisha, is a Hindu festival where Lord Jagannath, Balabhadra, and Subhadra are carried in wooden chariots from the Jagannath Temple to the Gundicha Temple. The temple, built in the 10th century by the Eastern Ganga dynasty, exemplifies Kalinga architecture.

Comparison:

- Compared to other chariot festivals like Tirupati's Brahmotsavam, Puri's Rath Yatra is the largest and oldest, with unique wooden idols.
- Unlike North Indian temples, Jagannath Temple's Kalinga architecture features distinct sectional structures.

Overview:

The Rath Yatra is a vibrant cultural and religious event, reflecting India's rich temple traditions and communal harmony, drawing millions of devotees annually.

Key Features/Details:

- **Rath Yatra**: Oldest Hindu chariot festival in Ashadh (June/July); deities move from Jagannath to Gundicha Temple for a week, returning via Bahuda Yatra.
- **Jagannath Temple**: Built by Anantavarman Chodaganga (10th century); Kalinga architecture with Deula and Vimana structures; wooden idols replaced every 12/19 years.
- **Deities**: Jagannath (Vishnu), Balabhadra, Subhadra.

Cultural Significance:

- The Rath Yatra symbolizes India's syncretic traditions, integrating tribal and Hindu elements, and strengthens cultural identity.

C. SANKARAN NAIR

Source: *The Times of India (July 14, 2025), The Hindu (July 15, 2025)*

UPSC Connection: Modern History, Social Reforms; Relevant for UPSC Prelims and Mains (GS1 – History, Society).

Definition/Detailing:

C. Sankaran Nair (1857–1934), featured in the film *Kesari Chapter 2*, was a liberal constitutionalist, jurist, and social reformer who advocated for liberty, equality, and secularism. His resignation from the Viceroy's Executive Council post-Jallianwala Bagh massacre highlighted his commitment to justice.

Comparison:

- Compared to other Congress leaders like Gandhi, Nair favored constitutional methods over non-cooperation, emphasizing rational governance.
- Unlike conservative reformers, he opposed sectarian institutions like Banaras Hindu University.

Overview:

Nair's contributions to India's freedom struggle and social reforms reflect his vision for a secular, equitable India, making him a significant figure in modern Indian history.

Key Features/Details:

- **Background**: Born in Malabar, Kerala; first Malayali Congress president (Amaravati, 1897).
- **Achievements**:

  Advocate General and Madras High Court judge.

  Viceroy's Executive Council member (education, health).

  Resigned post-Jallianwala Bagh massacre.
- **Contributions**:

  Advocated secularism, women's empowerment, caste abolition.

  Opposed non-cooperation and Khilafat movements; wrote *Gandhi and Anarchy* (1922).

  Resisted Village Cess Bill to protect self-governing villages.
- **Vision**: Promoted English education and rational discourse for social emancipation.

Legacy:

- Nair's vision for a rational, secular India remains relevant, inspiring policies for social justice and inclusive governance.

DAOJALI HADING: NEOLITHIC SITE IN ASSAM

Source: *The Hindu (July 12, 2025), The Indian Express (July 13, 2025)*

UPSC Connection: History, Archaeology; Relevant for UPSC Prelims and Mains (GS1 – History, Culture).

Definition/Detailing:

Daojali Hading, a Neolithic site in Assam's Dima Hasao district, dates back over 2,700 years. Recent excavations revealed evidence of early metallurgy, including a furnace and iron slag, linking it to Eastern and Southeastern Asian Neolithic cultures.

Comparison:

- Compared to other Neolithic sites like Burzahom (Kashmir), Daojali Hading's metallurgy evidence suggests advanced technological practices.
- Unlike Harappan sites, it represents a regional Neolithic culture with distinct artifacts like cord-marked pottery.

Overview:

The discovery of Daojali Hading underscores Assam's role in India's prehistoric landscape, highlighting early human settlement and technological advancements in the Northeast.

Key Features/Details:

- **Location**: Langting-Mupa Reserve Forest, Dima Hasao, Assam.
- **Age**: Over 2,700 years old.
- **Artifacts**: Polished double-shouldered celts, cord-marked pottery, mortars, pestles, jadeite stone, furnace, iron slag.
- **Significance:** Evidence of metallurgy; linked to Eastern/Southeastern Asian Neolithic cultural complex.

Archaeological Significance:

- Daojali Hading strengthens India's narrative of ancient technological innovation, contributing to global archaeological discourse.