

OFFICERS' PULSE



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Foreword

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

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

Sample:

KEY WORDS

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

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1) TRIBAL POPULATION IN INDIA

(GS Paper I: Indian Society)

Background

Scheduled Tribes (STs), notified under Article 342 of the Constitution, are communities marked by distinct culture, geographical isolation, and socio-economic backwardness. Recent tribal mobilisations in 2026, such as the Maharashtra Long Marches and Hasdeo Aranya protests, highlight gaps in implementing the PESA Act (1996) and FRA (2006), showing the need for an empowerment-focused approach that ensures Gram Sabha consent and protects tribal resources.

Demographic Profile

- According to the Census 2011, Scheduled Tribes constitute about 8.6% of India's population, amounting to roughly 10.43 crore people. With population growth, the number is expected to be higher in 2026 estimates.
- Among them are 75 Particularly Vulnerable Tribal Groups (PVTGs) spread across 18 states and one Union Territory. These groups are characterized by declining or stagnant populations, extremely low literacy levels, and subsistence-level livelihoods.
- In terms of geographical distribution, the largest tribal populations are found in Madhya Pradesh, Maharashtra, and Odisha. In the North-East region, states like Mizoram and Nagaland have a tribal population exceeding 90% of their total population.

Constitutional and Policy Framework

- **Constitutional Mandates for Equity and Justice: Article 46 (DPSP)** directs the State to promote the educational and economic interests of STs and protect them from exploitation, supported by Articles 15(4) and 16(4) (reservations), Article 23 (prohibition of forced labour), and Articles 330/332 (political representation).
- **Asymmetric Administrative Arrangements:** Article 244(1) & (2) provides special governance through the **Fifth Schedule** (Scheduled Areas) and **Sixth Schedule** (Autonomous District Councils in the North-East). Article 342 empowers the President to notify STs, while Article 275(1) provides Union grants for tribal development.
- **Rights-Based Legal Safeguards:** The **Panchayats (Extension to Scheduled Areas) Act, 1996** and **Forest Rights Act (FRA, 2006)** empower Gram Sabhas to manage resources and recognize forest rights. The **SC/ST Prevention of Atrocities Act (1989)** protects against discrimination through special courts and stricter penalties.
- **Institutional Oversight and Education: Article 338A** established the **National Commission for Scheduled Tribes (NCST)** via the 89th Amendment (2003) to monitor safeguards and investigate grievances. Educationally, the **Eklavya Model Residential Schools (EMRS)** serve as flagship institutions to provide quality middle and high-level education in remote tribal blocks.
- **Targeted Economic and Welfare Missions:** The **Scheduled Tribe Component (STC)** ensures proportional budget allocation, while **TRIFED (1987)** and **Van Dhan Vikas Kendras** secure fair prices for Minor Forest Produce. Most recently, the **PM-JANMAN Mission (2023-24)** targets **all 75 notified PVTGs** with 11 critical interventions like housing, water, and connectivity.

Challenges Faced by Tribal Communities

Despite constitutional safeguards, tribal communities continue to face several challenges.

- **Enumeration & Data Invisibility:** Groups like **DNTs** and the **Jarawa** face systemic **exclusion from developmental benefits due to isolation protocols**, leading to Supreme Court demand for separate 2027 Census inclusion.
- **Land Alienation & Displacement:** Administrative land acquisition for development (e.g., **Lakshadweep/Agatti**) and the lack of formal settlement recognition for groups like the **Paliyar** threaten traditional habitats.
- **Legal & Gender Inequality:** Traditional customary laws often conflict with constitutional rights, specifically regarding the denial of equal inheritance to **Gond women**.
- **Livelihood & Global Vulnerability:** Tribal artisans, such as the **Hakki Pikki**, face severe international legal and visa crises when trading traditional products abroad without state-backed safeguards.
- **Cultural & Social Marginalization:** Indigenous groups like the **Irular** struggle to maintain their cultural identity and access to ancestral sites (e.g., Mamallapuram) amidst rapid social and economic shifts.

Way Forward

- **Saturate Rights Recognition (Mission-Mode):** Conduct time-bound, block-level saturation camps to clear the large backlog of FRA claims. Example: The 2026 Maharashtra assurance to resolve 11,000+ pending claims can serve as a model.
- **Strengthen Gram Sabha Sovereignty:** Strictly enforce the “**Prior Informed Consent**” under PESA to prevent misuse of approvals for projects. Example: Follow the Hasdeo Bachao Sangharsh Samiti model of community led environmental monitoring to protect ecosystems.
- **Digital Accuracy & Financial Inclusion:** Improve land record digitization to match ground realities and help forest rights holders access bank credit. Example: Link FRA title holders with the PM-KISAN database to reduce the documentation gap.
- **Mainstream DNT/NT Rights:** Create a permanent statutory body for De-notified, Nomadic, and Semi-Nomadic Tribes to address historical exclusion. Example: Extend the PM-JANMAN approach for PVTGs to DNT communities in rural and urban areas.
- **Climate-Resilient Tribal Livelihoods:** Invest in irrigation and diversified farming to reduce dependence on rain-fed agriculture. Example: Promote multi-cropping under the Dharti Aaba Janjatiya Gram Utkarsh Abhiyan (2024–2026) to improve tribal incomes.

Conclusion

To achieve the vision of **Viksit Bharat @ 2047**, tribal development must move from a model of **displacement to one of inclusive growth**. Current policies emphasize the “**saturation of services**”, ensuring that every tribal household receives essential benefits such as **land rights, healthcare, education, and livelihood support**, while also preserving their unique cultural identity and traditions.

Key words

- **Enumeration:** The process of counting and collecting data about people (e.g., population census)
- **Social Marginalization:** Exclusion of certain groups from social, economic, and political opportunities.
- **Land Alienation:** Loss of tribal land to non-tribals due to legal or illegal means.

2) PERSONS WITH DISABILITIES (PWDS) IN INDIA

(GS-II: Social Justice & Governance)

Background

India's approach towards Persons with Disabilities (PwDs) is shifting from a welfare-based model to one focused on rights, inclusion, and economic participation, as seen in recent initiatives like the Divyangjan Kaushal Yojana (2026–27 Budget). However, despite measures such as improving accessibility and mobility, gaps in employment and digital inclusion highlight the need for a more comprehensive and barrier-free framework.

Constitutional and Policy Framework

- **Fundamental Rights: Articles 14, 15, 16, and 21** ensure equality before law, prohibit discrimination, guarantee equal opportunity in public employment, and uphold the right to live with dignity for persons with disabilities, including a barrier-free environment.
- **Directive Principles of State Policy: Articles 41 and 46** direct the State to provide work, education, and public assistance, and to promote the welfare and protect the interests of persons with disabilities.
- **Legislative & Local Governance Framework:** The **Seventh Schedule** (State List Entry 9 and Concurrent List Entry 23) assigns disability relief and social security responsibilities, while **Articles 243G and 243W** empower local bodies to implement welfare schemes for persons with disabilities.
- The **Rights of Persons with Disabilities (RPwD) Act, 2016** is the primary law, expanding disabilities from 7 to 21 categories and **providing 4% job and 5% education reservations**.
- The **National Trust Act, 1999** focuses on welfare and guardianship for specific disabilities, while the **Rehabilitation Council of India (RCI) Act, 1992** ensures quality training and certification of rehabilitation professionals.

Initiatives related to Persons with Disabilities (PwDs) in India

- Divyangjan Swavalamban Yojana (DSY)
- Vishesh Microfinance Yojana (VMY)
- Deendayal Disabled Rehabilitation Scheme (DDRS)
- Sugamya Bharat Abhiyan (Accessible India Campaign)
- National Divyangjan Finance and Development Corporation (NDFDC)
- National Institutes and Composite Regional Centres (CRCs)
- National Fund for Persons with Disabilities
- Unique ID for Persons with Disabilities (UDID)
- PM-eVIDYA (ISL Channel)
- PM-DAKSH-DEPwD Portal
- PRASHAST App
- Divyangjan Kaushal Vikas
- Assistance to Disabled Persons for Purchase/Fitting of Aids/Appliances (ADIP)
- Divya Kala Mela
- SACRED Portal
- National Fellowship for Students with Disabilities

Challenges Faced by Persons with Disabilities

Despite legal protections, PwDs continue to face several challenges.

- **Economic Exclusion & the "Glass Ceiling":** PwDs make up less than **1%** of the private workforce. Even when hired, they face systemic bias and lack of upward mobility into leadership roles.
- **Infrastructure & Transit Lags:** While airports have improved, the **Accessible India Campaign** has met less than **30%** of its broader targets. Only **6%** of public buses are fully accessible, creating a "mobility tax" for PwDs.
- **Educational & Administrative Barriers:** Fewer than **50% of schools** have functional ramps, and only **25%** have accessible toilets. Delays in issuing **UDID cards** continue to block access to essential welfare.
- **Healthcare & Insurance Gaps:** Over **80% of PwDs** remain uninsured. High premiums and arbitrary rejections for assistive technology coverage leave many without the necessary tools for daily independence.
- **The Digital Divide:** Approximately **98% of websites** still fail basic accessibility audits. Digital banking and KYC processes (facial/biometric) often lack alternative protocols, leading to financial exclusion.

Way Forward: Transitioning to an Inclusive India

- **Enforcing Universal Design & Statutory Mandates:** Shift from "retrofitting" to "inclusive-by-design" for all new infrastructure to eliminate physical barriers. **Example:** Replicating **Chennai's Marina Beach Permanent Ramp**, a climate-resilient model that ensures shoreline access for wheelchair users.
- **Mission-Mode Certification & Doorstep Governance:** Close the "Certification Gap" through block-level saturation camps to ensure 100% **UDID** coverage. **Example:** Institutionalizing the **2024–2026 Doorstep Voting** model for all essential government services to reach those with 40%+ disability at their residence.
- **Scaling Indigenous Assistive Technology (AT):** Support deep-tech startups to develop low-cost, AI-based prosthetics and tools under "Make in India." **Example:** Using platforms like **Purple Fest (Goa/Delhi)** as living labs for PwDs to test smart canes and AI-vision glasses in real-world settings.
- **Promote Community-Based Rehabilitation (CBR):** Move beyond clinical hospital care toward integrated, tech-enabled support systems. **Example:** Scaling the **Model Assistive Village (Malappuram)**, which provides families with on-site therapy and vocational training in a supportive residential environment.
- **Legislating Digital & Healthcare Inclusion:** Enact a "**Digital Accessibility Act**" with strict penalties for non-compliant apps and banking services. **Example:** Following the **European Accessibility Act (EAA)** and Japan's **24/7 Sign Language Call Centers** to provide 24/7 remote medical and emergency support for the deaf.

Conclusion

The transition to **Viksit Bharat @ 2047** requires a "**Purple Economy**" that views disability as an inclusion opportunity rather than a burden, supported by universal design and indigenous technology, ensuring that disability does not limit aspirations.

Key words

- **Glass Ceiling:** An invisible barrier that stops certain groups from reaching higher positions despite their ability.
- **UDID cards:** A unique ID card for PwDs to access government benefits and services easily.
- **Purple Economy:** An economic system that includes and empowers persons with disabilities in all sectors.

3) RAJYA SABHA

(GS Paper- II: Parliament and State Legislatures—Structure, Functioning, Conduct of Business, Powers & Privileges and Issues Arising out of these)

Introduction

Amid debates on federalism and the Money Bill route, the relevance of the Rajya Sabha has come under scrutiny due to its perceived declining role in legislation and Centre–State relations. Constitutionally, it remains integral under Article 79 and Article 80, ensuring federal representation and legislative participation. Its special powers under Article 249 and Article 312 highlight its unique role in national interest and administrative integration. Despite challenges, it continues to be vital for federal balance, legislative scrutiny, and continuity in Indian democracy.

Significance and Special Powers of Rajya Sabha

- **Federal Representation:** As the "Council of States," it protects the interests of the states against central encroachment, ensuring that the Union Parliament cannot easily override state jurisdictions without the consent of the states' representatives.
- **Legislative Reviewer:** It serves as a "**House of Correction**," providing a platform for a second, more dignified debate on bills. This prevents the passage of "hasty and ill-considered" legislation that might be pushed through by a temporary majority in the Lok Sabha.
- **Special Power under Article 249:** The Rajya Sabha holds the exclusive power to pass a resolution (by a two-thirds majority) authorizing Parliament to make laws on a subject in the **State List** if it is deemed necessary in the national interest.
- **Creation of All-India Services (Article 312):** It has the sole authority to initiate the creation of new **All-India Services** common to the Union and the States. This is a critical federal power as these officers (like IAS/IPS) serve both levels of government.
- **Institutional Continuity:** Being a **Permanent House** (not subject to dissolution), it ensures the continuity of the Indian State. If the Lok Sabha is dissolved, the Rajya Sabha can still meet to approve urgent proclamations, such as the extension of an Emergency.
- **Intellectual Expertise:** Through the nomination of **12 members** by the President from fields like Science, Art, and Literature, it brings specialized knowledge into the legislative process without the pressure of direct electoral politics.

Challenges and criticisms

- **Erosion of Deliberative Character:** Critics argue the House is losing its status as a "House of Wisdom." Legislative business is increasingly conducted through **voice votes** amidst disruptions, with many bills being passed in under 30 minutes without the detailed scrutiny originally intended by the Constitution.
- **The "Money Bill" Bypass:** A major constitutional concern is the government's frequent use of **Article 110** to label contentious legislation as "Money Bills." This practice effectively strips the Rajya Sabha of its power to amend or reject laws, undermining its role as a federal check on the Lok Sabha.
- **Declining Productivity and Frequent Disruptions:** The 2025–26 sessions saw productivity levels dip significantly (at times below **40%**). Constant adjournments and political stalemates have led to the "Guillotine" of important discussions on the Union Budget and the 16th Finance Commission.
- **Criminalization and Wealth Disparity:** Reports from early 2026 highlight that nearly **one-third of members** have declared criminal cases, while the average assets per MP have surged to over

₹120 crore. This leads to the criticism that the House represents "money power" rather than the specialized expertise or "sober second thought" it was designed for.

- **Partisanship of the Chair:** There has been increasing friction between the Opposition and the Presiding Officers. Recent allegations of **partisan conduct** and the frequent dismissal of notices for short-duration discussions have led to claims that the Upper House is being used to suppress dissenting voices rather than facilitate federal dialogue.

Way Forward

- **Codifying the "Money Bill" Criteria:** To prevent the executive from bypassing the Upper House, the Supreme Court or a Constitutional Amendment should provide a stricter, more objective definition of **Article 110**. This would ensure that only purely financial matters are tagged as Money Bills, preserving the Rajya Sabha's right to deliberate on general legislation.
- **Ensuring Minimum Sitting Days:** Legislative reforms should mandate a minimum number of sitting days (e.g., **100 to 120 days per year**) for the Rajya Sabha. This would reduce the reliance on "guillotining" budgets and ensure that critical issues like the **16th Finance Commission** recommendations receive adequate floor time.
- **Mandatory Committee Scrutiny:** To counter the trend of "rushed legislation," it should be made mandatory to refer all non-emergency bills to **Departmentally Related Standing Committees (DRSCs)**. This ensures technical expertise is applied to laws before they are put to a vote, upholding the House's role as a "House of Wisdom."
- **Population-Based Representation in Rajya Sabha:** Seats in the Rajya Sabha are broadly allocated to states based on their population, ensuring proportional representation. Larger states like Uttar Pradesh have more members compared to smaller states. However, representation is not strictly proportional, as smaller states are given minimum seats to maintain federal balance. Any change in seat allocation requires constitutional amendment, and unlike the Lok Sabha, it is not directly revised after every census.
- **Strengthening the Role of the Chairman:** Enhancing the neutrality of the Chair is vital. Adopting conventions where the Presiding Officer distances themselves from party politics, similar to the British House of Commons, would foster better cooperation between the Treasury and Opposition benches.

Conclusion

The Rajya Sabha remains an indispensable pillar of Indian democracy, serving as a federal balance and a check against legislative haste. While contemporary challenges like frequent disruptions and the "Money Bill" bypass threaten its institutional efficacy, systemic reforms in its deliberative processes can restore its prestige. By evolving into a more proactive and neutral chamber, it can continue to uphold the constitutional vision of being a "House of Wisdom" that protects both the interests of the States and the integrity of the Union.

KEY WORDS

- **Federal Balance-** Ensures representation of states and protects their interests in the Union's law-making process.
- **Deliberative Check-** Acts as a revising chamber to scrutinize and improve legislation passed by the Lok Sabha.

UPSC PYQ

- *Rajya Sabha has been transformed from a 'useless stepney tyre to supporting organ in past few decades. Highlight the factors as well as the areas which this transformation could be visible. [250 Words] [15 Marks] [2020]*

4) RTI ACT VS DPDP ACT

(GS Paper- II: Important aspects of governance, transparency and accountability, e-governance-applications, models, successes, limitations, and potential; citizens charters, transparency & accountability and institutional and other measures)

Introduction

Transparency in India is transitioning from a reactive, RTI-led model to a proactive, digital-first framework, as seen in initiatives like DBT and GeM. However, the Digital Personal Data Protection (DPDP) Act, 2023, has introduced a significant constitutional friction between the "Right to Know" (**Article 19(1)(a)**) and the "Right to Privacy" (**Article 21**). This tension culminated in early 2026, with the Supreme Court referring challenges against **Section 44(3) of the DPDP Act to a Constitution Bench to determine if the amendment grants "unguided discretion" to the executive to deny information**. Ultimately, the judiciary aims to apply the Doctrine of Harmonious Construction to ensure that privacy protections do not extinguish the essential public interest override mandated by the original RTI framework.

Key Amendments: Dilution of the RTI Framework

- **Removal of the "Public Interest" Override:** The amendment to **Section 8(1)(j)** of the RTI Act is a major shift; it eliminates the discretionary power of Information Officers to disclose personal data even if the "larger public interest" justifies it, effectively prioritizing privacy over accountability.
- **Creation of a Blanket Exemption:** By removing the public interest balancing test, the law establishes an absolute legal shield. This allows the state to withhold sensitive information regarding public officials, such as assets, educational qualifications, and disciplinary records under the broad umbrella of "personal information."
- **Deletion of the "Parliamentary Proviso":** A foundational democratic safeguard has been removed: the clause stating that information which cannot be denied to **Parliament or a State Legislature** shall not be denied to a citizen. This breaks the link between legislative oversight and the citizen's right to know.
- **Expansive Definition of "Personal Data":** The DPDP Act defines personal data so broadly that, if interpreted without caution, it could encompass nearly all public records. This creates a risk that routine administrative data will be reclassified as "protected," making it inaccessible to the public.
- **Shift Toward Administrative Opacity:** Collectively, these changes signal a move from "Open by Default" to "Closed by Exception." By granting the executive wider latitude to deny requests, critics argue the framework risks transforming the RTI Act from a tool of empowerment into a mechanism for state secrecy.

Arguments in favour of the amendment

- **Harmonization with Global Privacy Standards:** The amendments align India's domestic laws with international benchmarks like the EU's GDPR. By providing a clear, statutory definition of

personal data, India establishes a "privacy-first" culture that is essential for participating in the global digital economy and cross-border data flows.

- **Protection of Public Servants' Privacy:** The removal of the "Public Interest" override for personal data prevents the "weaponization" of the RTI Act. It protects public officials from targeted harassment, doxxing, or the disclosure of sensitive personal details (like home addresses or medical records) that have no direct bearing on their official duties.
- **Legal Certainty and Reduced Litigation:** Previously, Section 8(1)(j) was often subject to subjective interpretation by different Information Officers, leading to inconsistent rulings and heavy litigation. A blanket exemption provides "Bright-line Rules," creating legal certainty for both the information seeker and the state, which theoretically reduces the backlog in Information Commissions.
- **Strengthening Data Security Infrastructure:** The amendments mandate that "Data Fiduciaries" (including government departments) adopt technical and organizational measures to prevent data breaches. This shifts the focus from mere "disclosure" to "safe custody," ensuring that the massive amounts of citizen data held by the state are protected by robust cybersecurity protocols.
- **Prevention of "Identity Theft" and Fraud:** By restricting access to databases that contain Aadhaar numbers, bank details, or biometrics under the guise of RTI, the amendments act as a critical defense against identity theft and financial fraud. This ensures that transparency does not come at the cost of a citizen's individual financial or digital security.

Challenges and concerns

- **Structural Dilution via DPDP Act:** The 2023 Act (and 2025-26 rules) has weakened the RTI framework by removing the "**Public Interest Override**" and the "**Parliamentary Proviso.**" By creating a blanket exemption for all "personal information," it provides a legal shield for public officials to withhold data on assets and disciplinary records, shifting the balance from citizen empowerment to administrative opacity.
- **Regulatory Chilling Effect on Oversight:** New rules classify investigative journalists as "**Data Fiduciaries,**" legally requiring them to seek consent from the officials they investigate. Combined with severe financial penalties (up to ₹250 crore) and the "right to erasure" for corrupt actors, these measures threaten to silence independent media and investigative reporting.
- **Blanket Immunity for Public Officials:** The new framework provides a legal shield that allows bureaucrats and politicians to withhold information previously considered public, such as assets, educational qualifications, and disciplinary records. Critics argue this transforms the RTI Act into a "Right to Deny Information," as any data linked to an identifiable individual is now reflexively categorized as exempt personal data.
- **Institutional and Adjudicatory Conflict:** There is a growing statutory collision between the **Information Commissions** and the newly formed **Data Protection Board**. As of early 2026, it remains unclear which body has primacy when a request involves both public transparency and private data, leading to legal uncertainty for Public Information Officers (PIOs) who now fear personal liability for wrongful disclosure.
- **Expansion of State Opacity and Surveillance:** While the law restricts citizens from accessing data about the government, it carves out vast exemptions for "**State instrumentalities**" to process citizen data without consent for national security or public order. This creates a "transparency asymmetry" where the state remains opaque to the public while simultaneously expanding its own digital surveillance capabilities over the citizenry.

Way Forward: Harmonizing Privacy and Transparency

- **Codifying a "Harm-Benefit Balancing Test":** To restore the strength of the RTI, the government should introduce a statutory "Public Interest Test" within the DPDP Rules. This would replace the current blanket exemption with a proportional disclosure regime, ensuring that "personal information" of public officials (like assets and credentials) is disclosed when it serves a larger accountability purpose.
- **Strategic Decoupling of Institutions:** A clear jurisdictional framework should be set between Information Commissions and the Data Protection Board. Information Commissions should have primary authority over RTI matters, with the Board acting only as a technical advisor. This avoids confusion and prevents PIOs from facing conflicting legal obligations.
- **Protecting Journalists and Whistleblowers:** The government should stop treating journalists as "Data Fiduciaries" (data handlers) when they are doing investigative work. This would remove the fear of the massive **₹250 crore penalty** that currently threatens the media. Additionally, by using anonymous digital tools and starting the **Whistleblowers Protection Act**, the state can make sure that a person's identity stays hidden while the corruption they expose becomes public.
- **Enhancing Proactive Disclosure (Section 4):** To reduce the adversarial nature of RTI petitions, government departments must strictly adhere to the **Proactive Disclosure** mandate. By shifting to a "Transparency by Design" architecture, where procurement data, project statuses, and departmental expenditures are hosted on real-time, machine-readable dashboards, the burden on Information Commissions can be reduced. When information is available *suo-motu*, the conflict over "request-based" personal data naturally diminishes.
- **Judicial Clarification on "Unguided Discretion":** The upcoming **Constitution Bench** review in 2026 must provide a "Bright-line Rule" to limit the executive's power under Section 44(3). The judiciary should reinforce the **Doctrine of Harmonious Construction**, ensuring that privacy protections under Article 21 do not extinguish the citizen's right to know under Article 19(1)(a). A clear judicial mandate is required to state that "State Instrumentalities" cannot use national security exemptions to evade routine accountability.

Conclusion

India stands at a critical juncture where the Right to Information Act, 2005 and the Digital Personal Data Protection Act, 2023 must be harmonized to balance transparency with privacy. While data protection strengthens individual rights, excessive restrictions risk weakening democratic accountability. A balanced approach rooted in public interest, institutional reforms, and technological transparency is essential. Ultimately, the goal should be a governance framework that is both **transparent and privacy-respecting**, ensuring trust between the State and citizens.

KEY WORDS

- **Transparency-Privacy Balance-** Ensures a fair balance between citizens' right to know and their right to privacy in governance.
- **Accountable Governance-** Promotes a system where the government remains answerable and responsible to the people.

5) GLOBAL NUCLEAR GOVERNANCE

(GS-II Important International Institutions, agreements and forums and their mandate)

Background

The erosion of the **New START Treaty** and escalating global conflicts have pushed the world to a precarious nuclear threshold, reviving Cold War-era anxieties. As traditional arms control mechanisms crumble, the risk of miscalculation or intentional escalation grows, threatening to undo decades of strategic stability.

Global Nuclear Governance architecture and its significance

1. The NPT Cornerstone

The Nuclear Non-Proliferation Treaty is **the foundation of global nuclear rules**, aiming to stop the spread of nuclear weapons while **allowing countries to use nuclear energy for peaceful purposes**. It works like a deal: **non-nuclear countries agree not to develop weapons**, and in return they get access to nuclear technology and a promise from nuclear powers to move towards disarmament.

2. Testing and Spatial Bans

The Partial Test Ban Treaty, Outer Space Treaty, and Seabed Arms Control Treaty together limit **where nuclear activities can take place**. They **ban nuclear tests in the atmosphere** and prevent nuclear weapons from being placed **in space or on the ocean floor**, helping to protect the environment and avoid the spread of military competition into these areas.

3. Export Control Regimes

The Nuclear Suppliers Group, Missile Technology Control Regime, Wassenaar Arrangement, and Australia Group act like **watchdogs for sensitive technologies**. They **coordinate countries' export rules** so that dual-use items such as chemicals or missile parts are not misused or accessed by unsafe or unauthorized actors.

4. Prohibition and Moral Norms

The Treaty on the Prohibition of Nuclear Weapons **reflects a humanitarian approach** by aiming to completely ban nuclear weapons and make their possession illegal under international law. It is **supported by Nuclear-Weapon-Free Zone Treaties**, which allow entire regions to stay free from nuclear weapons and avoid joining the nuclear arms race.

5. Strategic Global Stability

Together, these **frameworks help stop both the spread of nuclear weapons to new countries (horizontal proliferation)** and the buildup of more weapons by existing nuclear powers (**vertical proliferation**). Their importance lies in creating a more predictable and transparent global system, which reduces the chances of sudden crises, accidents, or nuclear war.

Challenges

- 1. Nuclear Ambitions of Rogue States:** Persistent concerns over Iran, North Korea, and other states **developing nuclear weapons strain the non-proliferation regime** and complicate global monitoring and diplomacy.
- 2. Non-State Actor Threats:** The risk of **terrorists or criminal networks acquiring nuclear or radiological materials** exposes gaps in safeguards and challenges international security frameworks.
- 3. Modernization of Nuclear Arsenals:** Existing nuclear powers are upgrading warheads, delivery systems, and hypersonic capabilities, **fueling vertical proliferation** and undermining strategic stability.

4. **Lack of Universal Participation:** Key states like **India, Pakistan, and Israel remain outside the NPT framework**, limiting the treaty's universality and enforcement, and also **reducing incentives for other countries to fully comply** with its provisions.
5. **Strategic Rivalries and Deterrence Dilemmas:** Growing **tensions between major powers** (US-Russia, US-China) can trigger arms races, reducing predictability and global stability.

Way forward

1. **Robust Diplomacy and Incentives:** Use a combination of **sanctions, dialogue, and positive incentives** to engage suspect states like Iran or North Korea, encouraging them **to curb nuclear ambitions** and adhere to non-proliferation norms.
2. **Transparency in Modernization:** Promote confidence-building measures, periodic disclosures, and **data sharing among nuclear states to reduce misperceptions**, prevent arms races, and maintain strategic stability.
3. **Adopt No-First-Use (NFU) policies:** Encourage nuclear states to commit to NFU doctrines to reduce the risk of pre-emptive or accidental nuclear strikes.
4. **Binding Compliance Mechanisms:** Develop **enforceable multilateral frameworks** under the UN or other **treaties to ensure violations are penalized**, improving accountability and making global nuclear governance more credible.
5. **Address regional security concerns:** Resolve geopolitical conflicts through diplomacy, as regional tensions often drive nuclear proliferation and arms races.

India's strategic Exceptionalism

- *India occupies a unique place in global nuclear governance. Although it is **not a signatory to the NPT** due to its discriminatory nature, India has integrated into the global **system by joining export control regimes like the MTCR**, reflecting its image as a responsible nuclear power.*
- *Its nuclear doctrine is **based on Credible Minimum Deterrence and a No First Use policy**, emphasizing restraint and defensive use of nuclear weapons while supporting universal nuclear disarmament.*
- *A key milestone was the 2008 NSG waiver, which enabled India to engage in global nuclear trade despite being outside the NPT, marking its transition from a nuclear outlier to a mainstream nuclear state while maintaining strategic autonomy.*

Conclusion

In an increasingly uncertain global environment, the risk of nuclear escalation is no longer confined to traditional state rivalries but is amplified by emerging technologies and weakening norms. Strengthening trust, transparency, and multilateral cooperation is essential to preserve the credibility of global nuclear governance. Ultimately, sustained commitment to disarmament and responsible state behaviour will determine the future of global security.

KEY WORDS

- **Horizontal Proliferation:** Spread of nuclear weapons to new countries, increasing global risk.
- **Vertical Proliferation:** Expansion or modernization of existing nuclear arsenals.

UPSC PYQ

- In what ways would the ongoing US-Iran Nuclear Pact Controversy affect the national interest of India? How should India respond to this situation? [2018]

6) MINING SAFETY

(GS-III Disaster Management)

Background

Mining, while vital for economic growth and industrial development, carries inherent risks that demand strict safety measures. **Accidents in mines** can lead to **devastating human and environmental consequences**, highlighting the need for careful regulation, advanced technology, and responsible practices. The **recent tragedy in the East Jaintia Hills in Meghalaya**, where a powerful explosion in an **illegal rat-hole mine** killed at least 18 workers, serves as a stark reminder of these dangers. Such incidents underscore the importance of enforcing safety standards and addressing illegal mining practices to protect lives.

Causing of Mining accidents

1. **Unscientific and Primitive Extraction Methods:** In regions like Meghalaya, "rat-hole" mining involves **digging narrow, 3-4 feet high tunnels without any structural support** (pillars) or ventilation, making them highly **susceptible to roof collapses** and asphyxiation from toxic gases.
Eg: Illegal rat-hole coal mine explosion in Meghalaya, India
2. **Illegal Use of Hazardous Explosives:** To maximize output at low costs, operators frequently use **unstandardized dynamite and crude blasting techniques** without professional supervision, triggering unintended collapses of adjoining mine shafts and trapping workers.
Eg: The illegal mine explosion in East Jaintia Hills in early 2026 was linked to unauthorized blasting in a rat-hole coal mine.
3. **Inundation and Poor Drainage Management:** Many accidents occur when **illegal mines are dug near old, flooded shafts or riverbeds**; without geological mapping, miners accidentally puncture these water pockets, leading to rapid, fatal flooding of the narrow tunnels.
Eg: 2018 Meghalaya rat-hole coal mine flooding.
4. **Negligence of Occupational Safety Protocols:** There is a pervasive **absence of basic safety gear** (helmets, gas detectors, boots) and **emergency exit routes**; in illegal setups, there are no "competent persons" as mandated by law to inspect the face of the mine before entry.
Eg: The disaster at the Lalmatia open-cast coal mine in Jharkhand's Godda district due to massive section of the overburden dump.
5. **Difficult Terrain and Geological Fragility:** Mining in ecologically sensitive zones often characterized by thin coal seams and loose soil **increases the risk of landslides and subsidence**, especially when extraction is carried out during the monsoon season or in unmapped areas.
Eg: In September 2025, a rockslide linked to illegal mining occurred in Alwar district of Rajasthan, burying three young men under falling rocks and debris.

Legal and Regulatory Framework for Mining in India

Mining in India is regulated through several laws and rules to ensure safety and proper management:

- **Mines Act, 1952**- It covers the health, safety, and welfare of all mine workers, including coal, metal, and oil mines.
- **Mines Rules, 1955**- It sets guidelines for medical check-ups, first-aid, drinking water, rest shelters, and other basic facilities for miners.
- **Coal Mines Regulations (2017) & Metalliferous Mines Regulations (1961)**- It specifies technical standards for mine planning, ventilation, transport, and the use of explosives.
- **MMDR Act, 1957 (Amended 2015/2021)**- It governs the development and regulation of mines. Section 23C allows state governments to make rules to prevent illegal mining and unauthorized transport or storage.
- **Directorate General of Mines Safety (DGMS)**- The main authority under the Ministry of Labour and Employment that enforces safety rules through inspections.

Challenges

1. **Political and Criminal Influence:** Many mining areas are **controlled by powerful local groups with political backing**. This makes it **hard for lower-level officials to enforce laws** or conduct inspections, as they may face threats or administrative pushback.
2. **Technology and Monitoring Gaps:** Satellite-based systems (like the Mining Surveillance System) can detect illegal mines, but actual **on-ground verification is weak**. In some regions, up to 85% of satellite alerts are ignored by local authorities.
3. **Dependence on Mining for Livelihoods:** For many **tribal communities**, **illegal mining is one of the few sources of quick income**. The lack of other job opportunities creates tacit support for illegal operations, making law enforcement difficult.
4. **Jurisdictional Conflicts:** In areas governed by the **Sixth Schedule**, there's often a clash between state regulations and traditional tribal rights over land and minerals. This creates legal confusion, **leaving many mines outside effective regulation**.
5. **Shortage of Inspectors:** Agencies like the DGMS and state mining departments **have too few qualified inspectors**. With thousands of legal leases and tens of thousands of illegal pits, safety audits are infrequent and often insufficient.

Way forward

1. **Promote Scientific Mining through Cooperatives:** Instead of banning mining completely, the government can **help local communities form cooperatives**. These cooperatives can invest in modern, safer equipment and follow official safety standards.
2. **Use Drones and IoT for Real-Time Monitoring:** Along with satellite checks, **drones and sensors can monitor mines continuously**, giving early warnings about illegal digging or unstable tunnels before accidents happen.
3. **Encourage Alternative Livelihoods:** To reduce dependence on risky mining, **states like Meghalaya should invest in other income sources such as eco-tourism**, horticulture, and food processing, offering safer and sustainable jobs.
4. **Ensure Strict Accountability:** Safety failures should have real consequences. **The "Polluter Pays Principle" should hold mine owners, contractors, and negligent officials financially and legally responsible for accidents**.

5. **Strengthen District Mineral Foundation (DMF) Programs:** DMF funds should be used more effectively for miners' health, safety training, and reclaiming abandoned mines to prevent accidents from old, unsafe shafts.

Conclusion

Mining safety in India cannot be viewed through a purely technical lens; it is a complex intersection of governance, human rights, and economic survival. The repeated tragedies in the Northeast and Central India highlight that laws on paper are a poor shield against the pressures of poverty and the greed of unregulated markets. A holistic approach combining strict technological oversight with a compassionate transition to sustainable livelihoods is the only way to ensure that India's mineral-led growth does not continue to be paved with the lives of its most vulnerable citizens.

KEY WORDS

- **Rat-hole Mining:** Primitive coal mining method in Meghalaya using narrow, unsupported tunnels.
- **Overburden Dump Collapse (Jharkhand):** Accident showing hazards of improperly managed mining waste.

7) BIOTECHNOLOGY SECTOR IN INDIA

(GS III - Science & Technology: "Developments and their applications and effects in everyday life": "Role of Science & Technology in the development of India, including biotechnology, IT, and industrial growth)

Introduction

Biotechnology refers to the **use of biological systems, organisms, or derivatives to develop products, technologies, or solutions** that benefit society across health, agriculture, industry, and environment. It integrates biology with engineering, data science, and chemistry to create value-added products with sustainability and economic impact.

Valued at over **\$195 billion in 2025**, India's biotech sector is one of the **largest and fastest-growing biotech startup ecosystems** in the world with over 10,000 startups, and the **largest vaccine producer** by volume. Beyond its 'Pharmacy of the World' status, the sector is now a 'Sunrise Industry' contributing **4.8% to GDP**. With the launch of the **BioE3 Policy**, India is aggressively pursuing a **\$1 trillion Bio-economy goal by 2047**, focusing on precision medicine, climate-resilient agriculture, and carbon capture

Strategic Importance of Biotechnology in India

1. **Industrial and Green Growth-** Biotechnology enables production of **bio-based chemicals, biopolymers, and industrial enzymes** from renewable resources, reducing reliance on petrochemicals. For instance, Praj Industries produces bioethanol and industrial enzymes; Godrej Biochemicals makes specialty enzymes and **biopolymers**.
2. **Food Security and Nutrition-** Biotech advances functional foods, smart proteins, and biofortified crops to improve nutrition and combat malnutrition, Iron-fortified rice, vitamin-A enriched crops, high-protein millets, and Indian startups like **GoodDot, Imagine Meats, and Blue Tribe Foods** are producing protein-rich foods from plant sources.

3. **Health and Precision Medicine-** Biotech supports **precision biotherapeutics**, including vaccines, monoclonal antibodies, cell and gene therapies. **Biocon Biologics** develops **monoclonal antibodies and biosimilars**. **Serum Institute of India** Produces **vaccines for COVID-19, polio, influenza, and other diseases**.
4. **Climate-Resilient Agriculture-** Biotechnology improves crop resilience, develops biofertilizers, biopesticides, and manages soil microbiomes to sustain productivity under climate stress. examples include BT Cotton (insect-resistant GM cotton) and **biofertilizers & microbial inoculants** are produced under **National Biotech Mission (DBT)**.
5. **Frontier Research and Sustainability-** Biotech startups are developing **CCU-based biofuels and bioplastics** to reduce CO₂ emissions. They explore **marine microbes, algae, and extremophiles** for pharmaceuticals and biomaterials. **Space biotech** studies plant growth and microbial processes in microgravity to advance sustainable and frontier research.

Challenges and concerns

1. **Regulatory & Policy Hurdles** - Multiple bodies (GEAC, RCGM, CDSCO, FSSAI) often lead to overlapping jurisdictions and delays. For instance, GM crop approvals can take over a decade due to bureaucratic inertia.
2. **Outdated Frameworks-** Current laws (Rules 1989) struggle to keep pace with **AI-driven drug discovery** and **CRISPR-Cas9** (Gene Editing), where the line between "modification" and "innovation" is blurred.
3. **Economic & Infrastructure Gaps-** While Biotech startups under **BIRAC** receive early grants but struggle to scale due to lack of **growth-stage venture funding**. Dependence on imported **enzymes, reagents, and lab equipment, along with limited large-scale biomanufacturing facilities in India**.
4. **Ethical & Social Concerns-** Advances in CRISPR-based gene editing and Synthetic Biology spark deep ethical concerns regarding "**designer babies**" and **socio-economic genetic divides**. Furthermore, persistent public and political resistance to GM food e.g., Bt Brinjal (moratorium since 2010) and legal challenges to GM Mustard (DMH-11).
5. **Biosecurity and Biopiracy Risks-** Rapid biotech advancements raise **biosecurity concerns**, including misuse of pathogens or accidental release of harmful organisms. Biopiracy **risks** involve exploitation of India's genetic resources and traditional knowledge without fair compensation.

Way forward

1. **Regulatory Modernization-** Enact the **National Biotechnology Regulatory Authority (NBRA)** to streamline overlapping jurisdictions and accelerate approvals for gene-edited crops and AI-driven drug discovery.
2. **Implementation of BioE3 Policy-** Focus on the **BioE3 (Economy, Environment, and Employment)** framework to establish high-performance biomanufacturing hubs. This will reduce import dependency on reagents and transition India from a consumption-based to a production-led bio-economy.
3. **Bridging the Capital gap-** To address these gaps, the 2026-27 budget introduced an **Infrastructure Risk Guarantee Fund** to encourage private capital, and expanded the electronics components manufacturing scheme with an outlay of ₹40,000 crore.
4. **Strengthening Biosecurity and Ethics-** Can develop **Protocols** to monitor dual-use research and prevent the accidental or deliberate release of pathogens. Establishing a transparent "**Bio-Ethics Committees**" to address the concerns

5. **Genetic Resource and IP Protection-** Strictly enforce **Access and Benefit Sharing (ABS)** under the Biodiversity Act to prevent biopiracy of India's traditional knowledge.

Conclusion

By 2047, the BioE3 Policy (2025) aims to transform India into a global **scientific superpower**, targeting a \$1 trillion biotechnology economy. Achieving this requires a shift from supply-driven to demand-driven ecosystems, with **R&D by DBT** and private players driving commercialization. By combining **technological sovereignty with ethical governance**, India can attain strategic autonomy and lead globally in **sustainable innovation and biosecurity**.

Other Government Initiatives & Frameworks

BioE3 Policy (2024): The most recent flagship policy focusing on regenerative biomanufacturing. It promotes **Bio-AI hubs** and **Biofoundries**.

Bio-RIDE Scheme: Merges existing R&D schemes to provide a unified funding and regulatory support system.

National Biopharma Mission (NBM): An industry-academia collaborative mission to accelerate drug development.

Biotech-KISAN: A scientist-farmer partnership program to bring biotech innovations to the soil level in 115 Aspirational Districts.

KEY WORDS

- **GEAC (Genetic Engineering Appraisal Committee)** - Apex body under MoEFCC that approves environmental release of genetically modified organisms (GMOs).
- **RCGM (Review Committee on Genetic Manipulation)** - DBT body that monitors safety and research of genetically engineered organisms in labs and field trials.
- **CDSCO (Central Drugs Standard Control Organization)** - India's national regulatory authority for approval of drugs, vaccines, and clinical trials.
- **FSSAI (Food Safety and Standards Authority of India)** - Regulates food safety, including approval and standards for GM and novel foods.
- **CRISPR-Cas9** - A gene-editing technology that enables precise modification of DNA sequences in living organisms.

UPSC PYQ

What are the research and developmental achievements in applied biotechnology? How will these achievements help to uplift the poorer sections of the society? **[2021]**

8) SPACE SECTOR IN INDIA

(GS III – Science & Technology: “Developments and applications of space technology in India, including satellites, launch vehicles, space missions, and their role in agriculture, disaster management, governance, resource management, and strategic/defence capabilities”)

Introduction

India’s space sector is shifting from a supply-driven developmental model to a demand-driven commercial ecosystem. India is among the **top space-faring nations** Guided by the Indian Space Policy 2023, India aims to grow from a 2% global share (\$8.4 bn) to around 10% (\$44 bn+) by 2033. This whole-of-nation approach leverages private participation to make India a global launchpad and hub for future space missions and innovations.

Strategic Importance of Space Sector in India

1. **Agriculture & Food Security** – Satellite-based remote sensing enables **precision agriculture**, crop health monitoring, and yield estimation through programs like FASAL, improving farm productivity and reducing losses.
2. **Disaster Management & Risk Reduction** – Satellites provide **cyclone prediction, flood mapping, and early warning systems** (tsunami, landslides). These applications enable timely evacuation and efficient disaster relief planning.
3. **Governance & Infrastructure Development** – Satellite communication supports **tele-education, telemedicine**, and platforms like **Bhuvan GIS portal** for urban planning, asset mapping under MGNREGA, and Smart Cities Mission.
4. **Resource Management & Environment** – Space technology facilitates **water resource mapping**, groundwater monitoring, watershed management, and urban planning through GIS-based tools, contributing to sustainable development.
5. **Strategic & Global Competitiveness** – Expansion of private participation, global launch services, and indigenous capabilities strengthen India’s **technological sovereignty**, reduce dependency on foreign space infrastructure, and boost **high-skilled employment and exports**.

Indian Satellites in Socio-Economic Development

- **INSAT-3D**- Helps in weather forecasting, cyclone tracking, and early warning systems.
- **Kalpana-1**- Provided data for weather monitoring and disaster warnings, especially cyclones.
- **GSAT-7**- Enables secure communication, also indirectly supports governance and coordination.
- **EDUSAT**- Supports tele-education by broadcasting educational content to remote areas.
- **Cartosat-1**- Used for urban planning, infrastructure development, and GIS applications like the Bhuvan portal.

Achievements and Major Missions

Chandrayaan Missions: Chandrayaan Series, India's successful lunar missions, enhancing planetary exploration credibility and demonstrating cost-effective engineering.

Solar Mission: Aditya-L1, positioned at Lagrange Point (L1) for continuous solar observation; helps understand solar flares and space weather impacts.

PSLV – Workhorse Launch Vehicle: High reliability and precision; launched **Indian and foreign satellites**, commercial success.

NavIC: India's indigenous GPS alternative; provides accurate positioning over India and surrounding region.

LVM3-M6 / BlueBird-2: Heaviest commercial payload launched from India (6,100 kg), showcasing **competitive heavy-lift capability**.

SPADEX: Autonomous docking of two spacecraft; foundational for **Indian Space Station (BAS)** and satellite refueling.

HOPE Mission (2025): Himalayan Outpost for Planetary Exploration; studies human endurance in extreme environments.

Challenges & Concerns

1. **Budgetary Stagnation** – Despite ambitions, ISRO's budget (~₹13,705 crore in 2026–27) has remained relatively flat, constraining R&D and mission expansion.
2. **Regulatory & Legal Gaps** – India has a **Space Policy (2023)** but lacks a comprehensive **Space Act**, creating uncertainty in liability, insurance, and private participation.
3. **Private Sector Constraints** – Limited access to funding, infrastructure, and testing facilities restricts startups from scaling and reduces global competitiveness.
4. **Global Competition** – Dominance of **USA and China** in advanced tech, reusable launch systems, and deep-space missions challenges India's high-end capabilities.
5. **Sustainability & Security** – Rising **space debris** and militarization increase risks. Anti-satellite weapons and lack of global governance frameworks threaten **safety and strategic autonomy**.

Way Forward

1. **Regulatory Reforms** – Enact a comprehensive **Space Act** to clarify liability, insurance, and private participation.
2. **Private Sector Facilitation** – Strengthen **IN-SPACE** and **NSIL** to enable industry-led satellite production, launch services, and commercialization.
3. **R&D and Innovation Focus** – Reorient ISRO towards **deep-space missions** and advanced technology development; transfer mature tech to private players.
4. **Global Integration & FDI** – Liberalize foreign investment and forge international partnerships to integrate India into **global space value chains**.
5. **Sustainability & Security** – Develop **space debris mitigation policies**, anti-satellite defense, and long-term sustainable space operations frameworks.

Conclusion

India's space sector is at a **critical juncture**, transitioning from a state-led model to a globally competitive, innovation-driven ecosystem. By addressing regulatory gaps, boosting private participation, and ensuring **sustainable and secure space operations**, **India can emerge as a leading space power**.

KEY WORDS

- **FASAL** – Uses satellite data and weather inputs to estimate crop production and improve agricultural planning.
- **Bhuvan GIS portal** – An Indian geo-platform that provides satellite imagery and spatial data for planning, governance, and resource management.
- **Indian Space Policy 2023** – Enables private sector participation in space activities and promotes commercialization of space technologies.
- **IN-SPACE** – Acts as a regulator and facilitator for private players to access India's space infrastructure.
- **NewSpace India Limited** – The commercial arm of ISRO responsible for marketing space products and services.

UPSC PYQ

- *"Discuss India's achievements in the field of Space Science and Technology. How the application of this technology has helped India in its socio-economic development?" [2016]*

9) Human Animal conflict

GS-III: Status, causes and consequences of human-animal conflict. Key initiatives for minimising human-animal conflict and further steps required to effectively mitigate human-animal conflict.

Background

Human-wildlife conflict in India is a major ecological and socio-economic challenge arising from rapid urbanisation, deforestation, agricultural expansion, and infrastructure development, which shrink natural habitats and create dangerous human-animal interfaces. It involves incidents such as crop damage by elephants, livestock depredation by predators, and attacks on humans, leading to economic losses, human fatalities, and retaliatory killings of wildlife.

Government Initiatives

- **National HWC Mitigation Strategy:** Focuses on early warning systems, preventive measures, rapid response, and community capacity building.
- **CAMPA Funds:** Used for afforestation, habitat restoration, and ecological improvements to reduce human-wildlife interactions.
- **Centrally Sponsored Schemes:** Programmes like Development of Wildlife Habitats and Project Tiger provide financial support to States/UTs for conservation and conflict mitigation.
- **Eco-Sensitive Zones (ESZs):** Buffer areas around protected areas that regulate development to minimise conflict.

Causes of Human–Wildlife Conflict

- **Population pressure & encroachment:** Expansion of settlements near forests increases human–wildlife encounters. *Eg:* Sundarbans (WB) – sea-level rise and population growth push settlements into mangroves, causing frequent tiger intrusions (e.g., Gosaba).
- **Habitat loss & fragmentation:** Infrastructure and commercial activities disrupt wildlife corridors. *Eg:* Kaziranga–Karbi Anglong landscape – highways and plantations trigger elephant incursions.
- **Decline in habitat quality:** Monoculture plantations (acacia, mangium, eucalyptus) degrade ecosystems and reduce fodder. *Eg:* Tripura – rubber plantations replace natural forests, pushing macaques and wild boars into settlements.
- **Changing agricultural practices:** Nutrient-rich crops near forests attract wildlife. *Eg:* Kodagu (Karnataka) – coffee and banana plantations draw elephants, increasing conflict.
- **Climate-Induced Stress:** Erratic monsoons and heat dry up forest water sources, pushing animals to villages. *Eg:* 2025 summers – elephants in Bandipur/Nagarhole moved to irrigation tanks.

Consequences of Human–Wildlife Conflict

- **Human impact:** In Kerala 67 human deaths reported; ~50% due to snakebites (mostly outside forests), followed by elephant and tiger attacks.
- **Economic toll:** Crop loss, livestock depredation, and property damage cause major financial losses. **Eg: Crop Loss in Kodagu** Farmers in this region report annual losses ranging from ₹50,000 to ₹1,50,000 per household due to elephant raids on coffee and paddy fields.
- **Threat to wildlife:** Animals are killed in accidents or retaliatory actions, undermining conservation efforts. *Eg:* In parts of Odisha and Chhattisgarh, villagers have been known to use **illegal electric fences** (hooking wires to overhead lines) to protect crops
- **Fiscal burden:** States incur significant expenditure on compensation and mitigation; Kerala, for instance, spent over ₹79 crore in six years on such measures. **Kerala Budget 2026–27:** ₹288.6 crore allocated for forestry & wildlife, including ₹100 crore for compensation and mitigation measures (smart barriers, Rapid Response Teams).

Way forward

- **Strengthening Habitat Connectivity:** Restore wildlife corridors for safe animal movement. *Eg:* Kaziranga–Karbi Anglong (2025) – corridor restoration improved migrations; Western Ghats (2026) – railway mitigation to reduce fragmentation.
- **Promoting Coexistence (Community Role):** Use traditional knowledge and community participation. *Eg:* Nyishi tribe protects hornbills; Maldharis coexist with lions; Irulas conserve snakes; Vulture Safe Zones involve local communities.
- **Scientific Land-Use Planning:** Build wildlife-friendly infrastructure (underpasses/overpasses). *Eg:* NH-44 (Kanha–Pench) underpasses; Assam elevated rail for elephant movement.
- **Protective Barriers: Bio-Fencing.** The use of **chili-tobacco ropes** and planting **thorny lemon trees** (which elephants dislike) around agricultural fields in Odisha has reduced crop-raiding by nearly **30% in 2024-25**.
- **Early Warning Systems: AI-based "Gajraj" System (2024–2026).** Deployed by Indian Railways across 700 km of tracks, this AI software detects elephant movement within **100 meters** of the track and sends automated alerts to train pilots to slow down.

Conclusion

Human–wildlife conflict in India reflects the growing imbalance between development and ecological sustainability. Addressing it requires a **holistic approach that combines habitat conservation, community participation, scientific planning, and technology-driven solutions**. By promoting coexistence and ensuring inclusive, evidence-based policies, India can **reduce conflict, protect biodiversity, and secure livelihoods**, in line with its sustainable development and conservation goals.

KEY WORDS

- **Eco-Sensitive Zones (ESZs):** Buffer areas around protected areas that regulate development to minimise conflict.
- **"Gajraj" System:** AI software detects elephant movement

10) Greater Nicobar Island Project

GS-III Bio-diversity & Environment

Background

The Great Nicobar Project has reached a critical stage in early 2026, balancing its strategic importance against serious environmental and social concerns. The National Green Tribunal (NGT) allowed the ₹92,000-crore project to proceed, refusing to stay its Environmental Clearance while emphasizing strict compliance with safeguards, especially for coral reefs and turtle nesting sites. Strategically, the project enhances India's geopolitical position near the Strait of Malacca, promotes economic autonomy by reducing dependence on foreign transshipment hubs, and strengthens military capabilities through dual-use infrastructure under the Andaman and Nicobar Command. However, it raises significant concerns, including large-scale deforestation (around 9.64 lakh trees), threats to biodiversity such as the Giant Leatherback Sea Turtle, and risks to indigenous communities like the Shompen and Nicobarese. As of March 2026, tribal protests have intensified, reaching New Delhi, while legal scrutiny continues with a pending case on forest clearance in the Calcutta High Court, keeping the project under active debate.

Importance

- **Strategic Location near Malacca Strait:** Great Nicobar lies about **40 nautical miles (74 km)** from the **Strait of Malacca**, one of the world's busiest maritime chokepoints, through which nearly **30% of global trade** and **70–80% of China's oil and energy imports** pass.
- **Natural Advantage:** Galathea Bay has a natural depth of **20 meters**, allowing ultra-large container vessels (20,000+ TEU) to dock without the massive, expensive dredging required at mainland ports.
- **Countering China's "String of Pearls":** The project acts as a **strategic deterrent** to China's expanding naval presence in the **Indian Ocean Region (IOR)** and helps balance regional maritime power dynamics.
- **Military Projection Capability:** The **dual-use airport and port infrastructure** will strengthen the **ANC (India's only tri-service command)**, effectively functioning as an **"unsinkable aircraft carrier"** in the region.
- **Logistical and Economic Autonomy:** With nearly **75% of India's transshipped cargo currently handled at foreign ports**, the project aims to **reclaim this revenue**, reduce logistics costs, and enhance India's role in global maritime trade.

- **Net Security Provider:** It positions India as a primary responder for **Humanitarian Assistance and Disaster Relief (HADR)** in Southeast Asia and aligning with the "**Act East Policy**" and **SAGAR** (Security and Growth for All in the Region) vision.

Challenges and Concerns

- **Large-Scale Deforestation:** The project involves the diversion of about **130 sq. km of pristine tropical rainforest** and the **felling of nearly 9.64 lakh trees**, raising serious environmental concerns.
- **Threat to Endemic Biodiversity:** **Galathea Bay** is India's most important nesting site for the **Giant Leatherback Sea Turtle** and also supports unique species such as the **Nicobar Megapode** and **Nicobar Macaque**, making the ecosystem highly sensitive.
- **Ecological Fragility:** The island forms part of a **UNESCO Biosphere Reserve**, hosting rich biodiversity and fragile coastal and forest ecosystems that could be significantly disturbed by large-scale infrastructure development.
- **Seismic and Disaster Risk:** Located in **Seismic Zone V**, the island experienced **land subsidence of nearly 15 feet during the 2004 tsunami**, raising concerns about the safety and long-term viability of major infrastructure projects.
- **Tribal Rights and Cultural Survival:** **Great Nicobar** is home to the **Shompen (a Particularly Vulnerable Tribal Group – PVTG)** and the **Nicobarese**, whose traditional habitats and livelihoods could be affected by development activities.
- **Risk from External Exposure:** Experts warn that the **influx of large numbers of outsiders** could expose the **isolated Shompen tribe to infectious diseases**, against which they have **little or no immunity**, posing a serious threat to their survival.

Way forward

- **Institutional Oversight & Ecological Realism:** Establish a **multi-stakeholder monitoring authority** (NITI Aayog, tribal representatives, WII, ZSI) for continuous audits. Adopt a **phased, adaptive approach**, allowing modification or scaling down if ecological damage is observed.
- **Tribal Protection: Inviolable Buffer:** Create **strict no-go zones** for Shompen areas with health safeguards (screening, vaccination). Ensure **Forest Rights Act (2006) compliance** and recognise tribal communities as key stakeholders with decision-making rights.
- **Scientific & Green Engineering:** Implement **green port technologies** (shore power, dark-sky lighting, noise-reducing systems). Use advanced methods like **Biorock technology** for coral restoration.
- **Disaster Resilience:** Develop **tsunami-resilient infrastructure** (elevated/modular designs). Integrate with **Indian Ocean Tsunami Warning System (IOTWMS)** for early alerts.
- **Rethinking Offsets:** Prioritise **on-island ecological restoration** (mangroves, invasive species control) over distant compensatory afforestation.

Conclusion

The Great Nicobar Project represents a **strategic and economic opportunity** to enhance India's maritime power, connectivity, and global trade presence. However, its success depends on achieving a **delicate balance between development and sustainability**. Addressing concerns related to biodiversity conservation, disaster risks, and tribal rights through **inclusive planning, strict environmental safeguards, and participatory governance** is essential. A calibrated approach will

ensure that the project strengthens India's strategic interests while preserving its ecological and cultural heritage.

KEY WORDS

- **Malaca Strait:** one of the world's busiest maritime chokepoints, through which nearly 30% of global trade
- **String of Pearls:** strategic location for China Act East Policy & SAGAR alignment

11) A DECADE OF INFLATION TARGETING

GS-III: Significance of India's Flexible Inflation Targeting framework, Monetary-fiscal coordination in managing supply shocks

Introduction

As India completes a decade of **Flexible Inflation Targeting (FIT)**, the year 2026 marks a historic shift with the launch of the **New CPI Series (Base Year 2024)** by MoSPI. This is the first major structural update since 2016, when India adopted the 4% (+/- 2%) "nominal anchor" to ensure long-term price stability. The February 2026 inflation print of **3.21%**—following a 2.75% low in January—is the first data point under this updated lens. By modernizing consumption weights, this "Statistical Reset" reflects a maturing economy where households spend less on basic food and more on modern services. This new series provides a more precise barometer for the RBI to steer India's monetary policy in the coming decade.

Achievements of the Inflation Targeting Regime (2016–2026)

- **Stabilizing Prices:** The FIT framework successfully brought down pre-2016 double-digit inflation to a stable **5% average**, helping to anchor the expectations of both households and investors.
- **Institutional Accountability:** The creation of the **Monetary Policy Committee (MPC)** shifted decision-making from an individual Governor to a transparent committee, making the process more credible and accountable.
- **Resilience to Global Shocks:** The **2–6% tolerance band** provided "policy space," allowing the RBI to support economic growth during the COVID-19 pandemic and absorb energy price shocks during 2022–2024.
- **Economic Certainty:** Predictable inflation targets have reduced the "inflation tax" on the poor and created a stable environment that encourages steady investment into the country.
- **Transparent Governance:** Regular **Inflation Reports** and published meeting minutes have democratized economic discussion, making the RBI one of the most transparent central banks globally.

New CPI Index and its Impact:

- **Changing Consumption Patterns:** The weight of **Food and Beverages** in the CPI basket has dropped significantly from **45.8% to 37.2%**, showing that as Indians get richer, they spend a smaller share of income on food.
- **Expansion of Services:** More weight is now given to **Housing (17.6%)**, Healthcare, and Education, reflecting the realities of urban living and digital consumption like streaming services.
- **Reduced Volatility:** Since food weights are lower, seasonal spikes in vegetable prices (like tomatoes and onions) will have a smaller impact on **Headline Inflation**, making the data more stable.
- **Focused Policy Action:** This shift allows the RBI to focus on demand-driven inflation rather than being forced to react to supply-side shocks (like bad weather) that are beyond its control.

- **Improved Precision:** By including 2024-era services, the new series gives the MPC a more accurate tool to decide when to tighten or ease interest rates.

Challenges and Concerns:

- **Sensitivity to Urban Housing:** With the weight of housing nearly doubling to **17.6%**, rising urban rents will now have a much larger impact on interest rate decisions than ever before.
- **Influence of Discretionary Items:** The Feb 2026 spike (3.21%) was largely driven by **Personal Care (Gold/Silver)**, showing that luxury items can now mask broader economic trends.
- **Monetary Transmission Gaps:** Despite ten years of this framework, commercial banks are often slow to pass **rate cuts** to borrowers, which limits the effectiveness of the RBI's signals.
- **Risk of Neglecting Food Costs:** A lower food weight might lead the RBI to focus on "Core Inflation," potentially ignoring the cost-of-living struggles still faced by the poorest 20% of the population.
- **Rapidly Changing Economy:** Relying on a 2024 base in a fast-moving digital world carries the risk that consumption habits might change again before the next official review.

Way Forward

- **Protecting Target Credibility:** The **4% inflation target** should be retained to maintain trust; "moving the goalposts" to 5% could signal a lack of resolve and confuse the markets.
- **Refining the Tolerance Band:** There is a strong case for narrowing the band from **+/- 2% to +/- 1.5%**, given that the new CPI series is expected to be less volatile.
- **Strengthening Monetary-Fiscal Sync:** While the RBI manages demand, the Government must manage **supply** through better cold storage and buffer stocks to make inflation targeting truly successful.
- **Improving Policy Reach:** There must be a tighter link between the **External Benchmark (EBLR)** and deposit rates to ensure that RBI's rate changes reach the common man faster.
- **Clearer Communication:** The RBI should move toward "**Forward Guidance**," giving the public clearer projections on how it plans to respond to future economic spikes.

Conclusion

The **2026 Statistical Reset** marks the maturation of India's monetary framework, moving from a model focused on survival to one that recognizes the complexities of a modern, service-oriented economy. While the first decade of inflation targeting provided a steady "Macro-Economic Anchor," the 2024 Base Year provides the "Precision Instrument" needed for the next phase of development. By balancing the RBI's discipline with proactive government intervention on the supply side, India can ensure that price stability remains the foundation of its journey toward a **\$10 trillion economy** and a "**Viksit Bharat**" by 2047.

KEY WORDS

- **Inflation Tax:** Loss of purchasing power due to inflation, hurting the poor more.
- **Headline Inflation:** Overall inflation including food and fuel.
- **Core Inflation:** Inflation excluding food and energy (shows long-term trend).
- **Monetary Transmission:** How policy rate changes affect lending and the economy.
- **EBLR:** External rate (like repo) linked to bank loans for better transparency.

UPSC PYQ

Do you agree with the view that steady GDP growth and low inflation have left the Indian economy in good shape? Give reasons in support of your arguments.

12) PRAHAAR DOCTRINE

GS-III Security Challenges and their Management in Border Areas - Linkages of Organized Crime with Terrorism

Background

In a significant step toward streamlining India's internal security framework, the Ministry of Home Affairs has released the **National Counter-Terrorism Doctrine (PRAHAAR Doctrine)**. This doctrine marks India's first comprehensive, unified blueprint aimed at transitioning from a reactive security posture to a proactive, intelligence-led, and technology-driven "zero-tolerance" approach against extremist threats.

Significance of the doctrine

The PRAHAAR Doctrine is structured around a comprehensive **seven-pillar framework**, where each letter of the acronym "**PRAHAAR**" meaning "**strike**" represents a core strategic objective.

- 1. Prevention of Terrorist Attacks:** Focuses on an "**intelligence-led**" **proactive approach**. It prioritizes the **early detection and disruption** of terror plots, **overground worker (OGW) networks**, and the misuse of the internet/dark web for radicalization or recruitment.
- 2. Responses (Swift and Proportionate):** Establishes a **graded response mechanism** where local police act as first responders, supported by **specialized state Anti-Terror Squads (ATS)** and elite national forces like the **National Security Guard (NSG) for major incidents**.
- 3. Aggregating Internal Capacities:** Aims for a "whole-of-government" synergy by modernizing law enforcement agencies, standardizing training modules, and ensuring seamless **coordination between central agencies (like the National Investigation Agency (NIA) and Intelligence Bureau (IB))** and state-level authorities.
- 4. Human Rights and Rule of Law:** Formally embeds constitutional safeguards and legal accountability into counter-terror operations. It ensures that **mitigation efforts remain just, transparent, and compliant with international human rights treaties**.
- 5. Attenuating Conditions Enabling Terrorism:** Targets the socio-economic and ideological drivers of extremism. This includes **de-radicalization programs, youth engagement, and dismantling the "terror-ecosystem"** that provides logistical and financial support.
- 6. Aligning International Efforts:** Strengthens global cooperation through intelligence sharing, Mutual Legal Assistance Treaties (MLATs), and extradition arrangements. It advocates for the designation of terrorist entities at the UN level to deny them safe havens.
- 7. Recovery and Resilience:** Adopts a "whole-of-society" approach to post-attack rehabilitation. It **focuses on psychological support, community rebuilding, and protecting critical infrastructure** to ensure the nation can bounce back swiftly from any disruption.

Challenges

1. **Inter-Agency Coordination Issues:** Even though agencies are supposed to work together, **rivalry and lack of trust between central and state bodies** often prevent smooth sharing of intelligence and joint action.
2. **Narco-Terror and Hawala Links:** The strategy **does not clearly explain how to break the strong connection between drug trafficking** (from regions like the Golden Crescent and Golden Triangle) **and illegal money channels like Hawala** that fund terrorism.
3. **Weak State Police Capacity:** **State police**, who respond first to attacks, often **lack enough personnel**, proper training (especially for urban combat), and modern equipment for investigation and surveillance.
4. **Cyber and AI Challenges:** **Tracking activities** on encrypted apps and tackling online radicalization **driven by AI is very difficult**, especially while respecting privacy and legal limits.
5. **Limited Role of External Forces:** The doctrine **mainly focuses on internal security** and **does not clearly define** how **external intelligence agencies** or the armed forces should act in cross-border counter-terror operations.

Way forward

1. **Build a Strong National Intelligence Grid:** **Fully activate and connect systems like NATGRID and Multi-Agency Centre** so that useful intelligence quickly reaches even local police without delays.
2. **Strengthen State Anti-Terror Units:** The central government should give **more funding and technical support to state ATS units**, helping them with better training (urban warfare, drones, digital forensics) and modern equipment.
3. **Use Private Sector Technology:** Work closely with **tech companies and startups to build advanced AI tools for detecting threats** and countering online radicalization more effectively.
4. **Target Terror Funding Networks:** Create a focused strategy to **break the link between drugs and terrorism by coordinating agencies like Financial Intelligence Unit** – India and anti-narcotics bodies to stop illegal money flows.
5. **Improve Global Cooperation:** India should continue **pushing for the Comprehensive Convention on International Terrorism** and use international agreements to ensure faster extradition and better tracking of global terror financiers.

Conclusion

The PRAHAAR Doctrine represents a watershed moment in India's security evolution, formalizing a "whole-of-society" commitment to defeating terrorism. While the framework provides a robust legal and operational architecture, its ultimate success will depend on bridging the gap between policy intent and ground-level execution through sustained political will and technological innovation. By balancing firm kinetic action with community-based de-radicalization, India can build a resilient security ecosystem capable of navigating the hybrid threats of the 21st century.

KEY WORDS

- **Proactive Security Shift:** *Moves from reactive response to intelligence-led prevention.*

13) 16th FINANCE COMMISSION

GS- III Indian economy and planning, mobilization of resources, progress, development an employment

Background

The **16th Finance Commission (FC)**, chaired by **Dr. Arvind Panagariya**, serves as the constitutional "balancing wheel" (**Article 280**) for Indian fiscal federalism. Mandated for **2026–2031**, it arrives at a pivotal moment, balancing the aspirations of a **\$5 trillion economy** with the structural realities of rising debt and uneven regional growth. Its task is to redefine the "Social Contract" between the Union and the States in an era of rapid urbanization and demographic transition.

Significance of Finance Commission

- 1. Transition to "Performance-Based" Federalism:** By introducing a 10% weight for "Contribution to GDP" (replacing "Tax Effort"), the commission now rewards states based on their actual economic productivity, signaling a shift from administrative effort to economic output.
- 2. Massive Boost to Urban Governance:** Urban Local Body (ULB) grants have been increased to **45% of total local grants** (up from 36% in the 15th FC), with a total allocation of **₹3.56 lakh crore** to support India's projected 41% urbanization level by 2031.
- 3. Ecological Expansion:** The **Forest & Ecology (10%)** criterion now includes "**Open Forests**" and specifically rewards the *increase* in forest cover between 2015 and 2023, moving beyond just preserving existing dense forests.
- 4. Modernizing Local Body Grants:** It allocated **₹8 lakh crore** with a new **80:20 structure** (80% Basic, 20% Performance). This enforces accountability by linking 20% of funds to the growth of a local body's **Own Source Revenue (OSR)**.
- 5. Climate-Adaptive Disaster Funding:** It allocated **₹2.04 lakh crore** for Disaster Management, moving away from simple relief to **Mitigation (20% weight)** and mandating the use of the National Disaster Management Information System (NDMIS).

Challenges

- 1. Stagnant Vertical Share:** Despite states demanding an increase to 50%, the commission **retained the 41% share**, leading to concerns about "vertical fiscal imbalance" as states' welfare responsibilities outpace their revenue powers.
- 2. The "Safety Net" Withdrawal:** The **complete discontinuation of Revenue Deficit Grants (RDG)** and sector-specific grants creates a massive fiscal shock for hill states and Special Category states that rely on these to bridge structural gaps.
- 3. Equity vs. Efficiency Debate:** Using **Income Distance (42.5%)** to help poor states while using **GDP Contribution (10%)** to reward rich states creates a "fiscal tug-of-war" that may neutralize the progressive nature of transfers.
- 4. Population Penalty:** Increasing the weight of the **2011 Census (17.5%)** continues to penalize Southern states that successfully controlled population growth, sparking fears of "demographic disadvantage."
- 5. Horizontal Winner-Loser Gap:** The new formula led to extreme variations—while **Kerala's urban grants increased by 400%**, states like **Bihar saw an 8% reduction**, potentially widening regional inequality.

Way forward

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1. **Restoring Vertical Balance:** To address the 41% stagnation, the Centre should **transfer more Centrally Sponsored Schemes (CSS)** to the "State List" along with funds, giving states true functional and fiscal parity.
2. **The "Grand Bargain" on Cesses:** The Centre should consider **capping Cesses/Surcharges at 10%** of Gross Tax Revenue. Any collection beyond this should be merged into the divisible pool to restore the spirit of Article 270.
3. **Targeted "Equalization" Grants:** To replace the lost RDG, the government should use **Article 275** to provide "Specific-Purpose Grants" that ensure a minimum standard of essential services in structurally disadvantaged states.
4. **Demographic Neutrality:** Future commissions should move toward a **"Life-cycle Cost" approach**, rewarding states not just for population control, but for the higher cost of caring for an **ageing population**
5. **A "Floor Guarantee" Mechanism:** To resolve the equity-efficiency debate, implement a **"No-Loss" guarantee** ensuring that no state's absolute tax share falls below its 15th FC levels during this transition phase.

Conclusion

The 16th FC represents a move toward **compliance-driven fiscality**. While it correctly identifies urbanization and GDP as engines of growth, its success hinges on ensuring that "efficiency" does not come at the cost of "equity." To achieve **Viksit Bharat**, the Commission must act not just as an auditor, but as a catalyst for **Cooperative Federalism**, ensuring the fiscal health of the Union is built upon the strength of its States.

14) AI IN PUBLIC GOVERNANCE

GS-III Science and Technology – developments and their applications

Background

Artificial Intelligence (AI) is no longer a futuristic concept but a primary driver of modern public administration. In the Indian context, AI in governance refers to the use of machine learning, data analytics, and automation to enhance the efficiency of public service delivery. As India marches toward a "Digital India," the transition from **E-Governance** to **AI-Governance (AIG)** represents a shift from mere digitization to "Intelligent Governance." By processing vast amounts of data, AI helps the state move from being reactive to proactive, ensuring that welfare reaches the last mile with minimal leakage.

How AI transforms the State

1. **Targeted Welfare Delivery:** AI algorithms analyze socioeconomic data to identify genuine beneficiaries for schemes like PM-Kisan or PDS, eliminating "ghost beneficiaries" and reducing fiscal leakage.
2. **Predictive Policing and Justice:** By analyzing crime patterns, AI assists law enforcement in "predictive policing." In the judiciary, AI tools like **SUPACE** are helping judges automate case research to reduce the massive backlog of cases.
3. **Smart Urban Management:** Under the Smart Cities Mission, AI-driven traffic management and waste disposal systems optimize urban resources, reducing congestion and environmental footprints.

4. **Agriculture and Disaster Management:** AI-powered weather forecasting and crop-pest analysis provide "precision agriculture" advice to farmers. Similarly, AI models predict floods and cyclones, enabling timely evacuations.
5. **Public Health and Education:** AI aids in early disease detection (e.g., screening for diabetic retinopathy) and powers "Personalized Learning" platforms that adapt to a student's pace in government schools.

Challenges

1. **The "Black Box" Problem:** AI decisions are often opaque. If a citizen is denied a welfare benefit by an algorithm, the lack of transparency makes it difficult to appeal the decision (the "Right to Explanation").
2. **Data Privacy and Surveillance:** In the absence of strict implementation of the **DPDP Act 2023**, there are fears that AI-driven facial recognition could lead to mass surveillance and the erosion of the Right to Privacy.
3. **Algorithmic Bias:** If the underlying data is biased (e.g., historical biases against certain communities), the AI will replicate and scale that discrimination in policing or hiring.
4. **The Digital Divide:** While AI flourishes in urban centers, the lack of high-speed internet and digital literacy in rural India could exacerbate existing inequalities.
5. **Cybersecurity Risks:** Centralized AI databases are high-value targets for cyberattacks, potentially compromising the personal data of millions of citizens.

- **AIforAll (NITI Aayog):** Promotes inclusive AI in healthcare, agriculture, education, smart cities, and infrastructure.
- **IndiaAI Mission:** Umbrella program to build a strong AI ecosystem (includes Innovation Centre).
- **AIRAWAT:** High-speed AI supercomputing cloud for research and governance.
- **Bhashini Mission:** AI-based translation platform for 22 Indian languages.
- **INDIAai Portal:** Central hub for AI resources, run by MeitY & NASSCOM.
- **Responsible AI for Youth:** AI education program for Classes 8–12.
- **Digital India Bhashini:** Enables voice-based internet access in local languages via "Bhasha Daan."
- **AI-SENS:** AI + satellite-based system for precision agriculture and crop monitoring.
- **SUPACE:** AI tool for Supreme Court to assist legal research.

Way forward

1. **Responsible AI Framework:** Implementing the **UNESCO Recommendation on the Ethics of AI**, ensuring that all government algorithms are audited for fairness and neutrality.
2. **Data Democratization:** Creating "Non-Personal Data" silos that can be used by startups to build localized AI solutions for Indian problems.
3. **Human-in-the-Loop (HITL):** Ensuring that final decisions involving fundamental rights such as criminal justice or healthcare are always reviewed by a human official.
4. **Capacity Building:** Training civil servants in "Data Literacy" so they can effectively manage and oversee AI systems without being over-reliant on private vendors.
5. **Public Consultations:** Before deploying high-impact AI (like facial recognition), the government should engage in transparent public dialogue to build social trust.

Conclusion

AI in public governance is a double-edged sword. While it offers an unprecedented opportunity to eliminate corruption and improve efficiency, it also poses risks to privacy and social equity. The goal of a "Viksit Bharat" requires a balanced approach where technology serves the citizen, and not the other way around. By grounding AI in the principles of **Transparency, Accountability, and Inclusion**, India can lead the global South in showing how technology can be a force for "Sabka Saath, Sabka Vikas."

KEY WORDS

- **Last-Mile Delivery:** Final stage of service delivery to citizens; often prone to leakages.
- **Ghost Beneficiaries:** Fake identities used to siphon welfare benefits.
- **Precision Agriculture:** AI-based farming using data for efficient crop management.
- **Black Box Problem:** AI decisions lack transparency and are hard to interpret.
- **Algorithmic Bias:** AI/system errors causing unfair or discriminatory outcomes.
- **Human-in-the-Loop (HITL):** Human oversight in automated decision-making.
- **Data Democratization:** Making data accessible to non-experts to boost innovation.

MODEL QUESTIONS

- 1) "The Rajya Sabha is not merely a 'secondary chamber' but a 'federal chamber' designed to protect the interests of the states against the potential majoritarianism of the Lok Sabha. In this context, examine the special powers of the Rajya Sabha that reinforce India's federal character."
- 2) "The Digital Personal Data Protection (DPDP) Act, 2023, marks a significant shift in India's transparency regime. Critically analyze the impact of the DPDP Act on anti-corruption efforts and the Right to Information in India."
- 3) "Global nuclear governance is under increasing strain due to emerging technologies and weakening arms control regimes." Discuss.
- 4) The recurring mining accidents in India, particularly in the Northeast, highlight the interplay of governance, technology, and livelihood issues. Critically examine the causes and challenges of mining safety in India and suggest measures for ensuring sustainable and safe mining practices.
- 5) Discuss the strategic importance of biotechnology in India. How do recent policy initiatives like the BioE3 Policy aim to accelerate growth in the biotech sector?
- 6) Examine the socio-economic and strategic contributions of India's space missions. How can India ensure sustainable and secure space operations in the coming decade.
- 7) Discuss the constitutional and legislative framework for persons with disabilities in India.
- 8) Examine the major challenges faced by tribal communities in India despite various policy interventions.
- 9) Human-animal conflict reflects a breakdown in coexistence rather than conservation failure". Discuss the statement. Examine ecological and socio-economic drivers of conflict. Suggest integrated mitigation strategies.
- 10) The Great Nicobar Project represents a strategic milestone for India's maritime ambitions but raises significant ecological and social concerns." Discuss.
- 11) "The 2024 rebasing of the Consumer Price Index (CPI) represents a fundamental shift in India's macroeconomic targeting. Analyze how this 'statistical reset' impacts the effectiveness of the Flexible Inflation Targeting (FIT) framework in future."
- 12) "The PRAHAAR Doctrine marks a shift in India's counter-terrorism strategy from a reactive to a proactive approach." Discuss the key features of the doctrine. Critically examine the challenges in its implementation and suggest measures to enhance its effectiveness.
- 13) "The 16th Finance Commission marks a shift towards performance-based fiscal federalism while raising concerns about equity among states." Discuss the key features of its recommendations. Critically examine the challenges it poses to cooperative federalism and suggest measures to address them.
- 14) "Discuss the opportunities and challenges of using Artificial Intelligence in public governance in India."