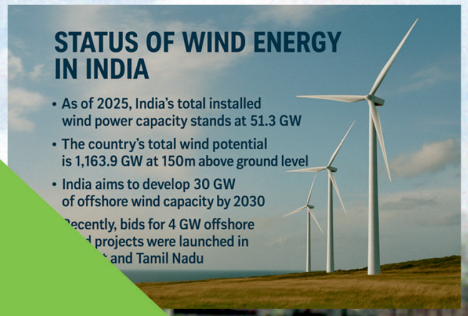
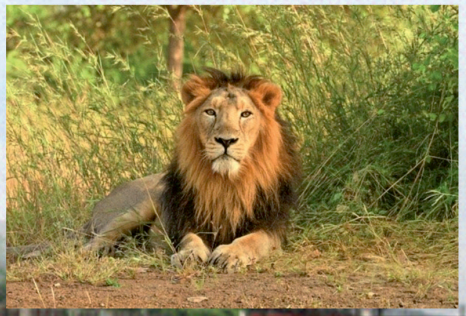
EXCEL CIVILS ACADEMY
EMPOWERING FUTURE LEADERS





# CURRENT AFFAIRS MAGAZINE

## 2025 SEPTEMBER

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EXCEL

CIVILS ACADEMY

EMPOWERING FUTURE LEADERS

# DIRECTOR'S MESSAGE

Dear Aspirants,

India's recent launch of the National Critical Mineral Mission (NCMM) represents a major strategic pivot aimed at securing the nation's future in clean energy and advanced manufacturing. This comprehensive policy directly addresses the intense global competition for essential resources like lithium, cobalt, nickel, rare earth elements (REEs), and platinum group metals (PGMs), which are vital for energy security, industrial growth, and technological self-reliance. The mission is a clear response to the reality of the 21st-century economy, where access to these resources dictates national prosperity, especially in light of China's overwhelming control over global supplies and processing capacity.

A cornerstone of the NCMM is a ₹1,500 crore incentive scheme designed to foster a circular economy and build large-scale recycling capacities. This focuses on tapping secondary sources such as e-waste, spent lithium-ion batteries, and end-of-life vehicles, offering an immediate sourcing pathway given the multi-year timelines for new mining projects. The mission's domestic vision is ambitious: creating at least 270 kilotonnes of annual recycling capacity, producing up to 40 kilotonnes of critical minerals annually, attracting approximately ₹8,000 crore in private investments, and generating nearly 70,000 jobs. These efforts are bolstered by amendments to the Mines and Minerals (Development and Regulation) Act, granting the central government exclusive authority over the auction of 24 out of 30 strategic minerals to streamline clearances and encourage private sector participation.

The NCMM also involves a robust drive for exploration and stockpiling. The goal is to identify 1,200 new critical mineral deposits by 2030 while establishing a seamless regulatory framework to boost domestic mining. Crucially, the mission mandates the development of strategic stockpiles of at least five core minerals. This is intended to create a vital buffer against unpredictable global supply disruptions, thereby safeguarding critical supply chains essential for national security and economic stability.

Complementing domestic efforts, international collaboration forms a key pillar of the strategy. Through projects like Khanij Bidesh India Ltd (KABIL), India has forged agreements with resource-rich nations, including Argentina, Chile, and Australia, to secure access to overseas reserves of minerals like lithium and cobalt. Simultaneously, the mission places a strong emphasis on Research and Innovation, targeting the filing of 1,000 patents in critical mineral technologies by 2030. This initiative is supported by the establishment of seven Centres of Excellence at leading IITs and national research labs to drive R&D breakthroughs, ultimately fostering homegrown expertise and reducing dependence on foreign technology.

The necessity of the NCMM is underscored by China's entrenched dominance as the world's primary processor and refiner. Beijing maintains its influence by heavily investing in refining capacities, acquiring foreign mine stakes, and periodically weaponising export controls—a power demonstrated by recent tightening of

restrictions. This near monopoly makes global industries in sectors like EVs, electronics, and defence highly vulnerable to price shocks and supply crunches. For India, diversifying access to critical minerals is a foundational requirement for meeting its net-zero targets by 2070, accelerating electric vehicle adoption, and powering next-generation industries from semiconductors to defence.

While the NCMM provides a comprehensive roadmap, formidable bottlenecks must still be overcome, including slow technological progress in deep-seated mineral extraction, environmental and social challenges, volatile global prices, and a domestic shortage of a skilled mining workforce. The mission, however, aggressively targets these issues through policy support, fast-track licensing, and research funding. Ultimately, the NCMM serves as a dual measure: a strategic shield against global economic shocks and a springboard for India to emerge as a self-reliant hub in the global clean energy value chain, actively reducing its reliance on China's mineral hegemony and reinforcing its sovereignty.

Best wishes.

Yours sincerely,

K Rajendra Kumar IPS (Retd)

# September-2025

# Current Affairs

## Contents

# 1 HISTORY & CULTURE

## Guru Tegh Bahadur

### Context:

Indian Railways will commemorate the 350th Martyrdom Day of Guru Tegh Bahadur Ji with special trains, cultural programs, and heritage initiatives.

### About Guru Tegh Bahadur:

### Who he was?

- Ninth Guru of Sikhism (1621–1675), remembered as Hind Di Chadar (Protector of India).
- Martyred in Delhi in 1675 for opposing forced conversions under Mughal rule.
- Symbol of spiritual courage, human rights, and freedom of conscience.

### Early Life and Education

- Born on April 1, 1621, in Amritsar, youngest son of Guru Hargobind Ji.
- Trained in martial skills, scriptures, music, and meditation from a young age.
- Participated in battles alongside his father, which instilled values of bravery and service.
- Later settled in Bakala (Punjab), leading a life of simplicity, deep meditation, and spiritual teaching.

### Key Contributions

#### 1. Religious Freedom

- Opposed the Mughal policy of forced conversions of Kashmiri Pandits.
- Offered his own life to uphold the right to practice one's faith.

#### 2. Teachings and Philosophy

- Emphasised spiritual strength over material wealth.
- Advocated compassion, humility, and equality of all humans.

#### 3. Community Development

- Founded several towns including Anandpur Sahib, which later became a Sikh spiritual and military centre.
- Strengthened Sikh institutions and spread teachings through hymns later included in the Guru Granth Sahib.

### Legacy

- Remembered as a champion of human rights and defender of oppressed communities.
- His sacrifice laid the foundation for Sikh militarisation under his son, Guru Gobind Singh.
- Today, he is honoured across India as a symbol of religious tolerance, justice, and moral courage.

## Chhath festival

### Context:

The Bihar art and culture department has nominated INTACH as its knowledge partner to prepare the dossier for the inclusion of Chhath festival in UNESCO's Intangible Cultural Heritage list.

## About Chhath festival:

### What it is?

- A Hindu Vedic festival dedicated to the Sun God (Surya) and Chhathi Maiya (goddess said to be Surya's sister).
- Celebrated twice a year — in Chaitra (March–April) and more prominently in Kartika (October–November).

### Where it is Celebrated:

- Primarily in Bihar, Jharkhand, Eastern Uttar Pradesh, and parts of Nepal.
- In recent decades, it has spread to Indian diasporas abroad.

### History:

- Considered one of the oldest Vedic rituals, with references to sun worship found in the Rig Veda and in stories related to Karna (Mahabharata).
- The practice emphasizes austerity, purity, and deep ecological consciousness.

### Features:

### A 4-day long festival with strict rituals:

1. Nahay Khay (Chaturthi): Ritual bathing and vegetarian meal.
2. Lohanda/Kharna: Day-long fast, broken with kheer and jaggery roti.
3. Sandhya Arghya: Offering of evening prayers to the setting sun.
4. Usha Arghya: Dawn prayers to the rising sun, marking completion.

- Devotees observe fasting, abstinence, holy dips, and offering prasad such as Thekua, Kasar, Kheer, and seasonal fruits.
- Deeply community-driven, celebrated on riverbanks, ponds, and water bodies.

### Significance:

- Symbolises gratitude to the Sun God for sustaining life and promoting prosperity, health, and longevity.
- Encourages discipline, simplicity, and ecological harmony through frugal rituals.

## Bengali Women Revolutionaries

### Context:

An editorial highlighted the untold stories of Bengali women revolutionaries, stressing their crucial role in India's freedom struggle and the need to recognise them as foundational architects of independence, not mere footnotes in history.

## About Bengali Women Revolutionaries:

### 1. Pritilata Waddedar (1911–1932)

- Led the armed attack on the European Club at Chittagong (1932), infamous for racial segregation.
- Consumed cyanide to avoid capture, leaving a legacy of courage.
- Called upon Indian women to "not remain in the background" of the freedom struggle.

### 2. Kalpana Datta (1913–1995)

- Participated in the Chittagong Armoury Raid (1930) led by Surya Sen.
- Arrested, imprisoned, and later wrote about her experiences, documenting women's equal role as "tacticians and partners."

### 3. Bina Das (1911–1986)

- Attempted to assassinate Governor Stanley Jackson at Calcutta University convocation (1932).
- Earlier defied orthodoxy by wearing khadi, distributing revolutionary pamphlets, and writing about banned books in exams.
- Symbolised intellectual and armed protest.

### 4. Begum Rokeya Sakhawat Hossain (1880–1932)

- Pioneering social reformer, feminist, and writer.
- Wrote Sultana's Dream (1905) envisioning a feminist utopia (Ladyland).
- Founded Sakhawat Memorial Girls' School in Kolkata; campaigned door-to-door for Muslim women's education.

### 5. Kamala Das Gupta (1907–2001)

- Member of Jugantar group; combined domestic cover with covert resistance.
- Smuggled arms in food baskets, hid fugitives, coordinated logistics.
- Memoir Rakter Akshare documents underground female networks.

### 6. Nanibala Devi (1898–1977)

- A widowed Brahmin who disguised herself as a mother, wife, servant for revolutionary tasks.
- Arrested and tortured in Peshawar, but chose silence over betrayal.
- Embodied endurance and sacrifice.

### 7. Labanya Prabha Ghosh (1886–1956)

- Social reformer and writer; organised reading groups, contributed to nationalist journals like Mukti.
- Opened her home for underground meetings.
- Used literacy as resistance to mobilise rural women.

### 8. Matangini Hazra (1869–1942) – "Gandhi Buri"

- Illiterate widow from Tamluk, Bengal.
- Led Quit India procession in 1942, chanting Vande Mataram.
- Shot multiple times while holding the tricolour; became a symbol of popular, grassroots resistance.

### Significance of Women in Indian Freedom Movement:

- Dual Struggle – They fought not only against British colonialism but also against entrenched patriarchy, redefining women's role in public life.
- Broadening the Meaning of Revolution – Their contributions ranged from armed assaults and covert operations to education and literature, proving resistance was multi-dimensional.
- Symbol of Courage and Sacrifice – By embracing martyrdom, enduring torture, or leading protests, women revolutionaries inspired mass participation and moral strength.
- Social Reform with Nationalism – Through schools, writings, and grassroots mobilisation, they linked freedom of the nation with emancipation of women.
- Mass Mobilisation Across Classes – From educated elites to rural widows, women bridged caste, class, and community, making the freedom struggle more inclusive.
- Legacy of Gender Justice – Their acts challenged the notion of women as auxiliaries, laying foundations for later feminist and empowerment movements in India.

### Conclusion:

The role of women in India's freedom struggle went beyond support; it was revolutionary in scope and spirit. By combining courage, intellect, and social reform, they challenged both colonialism and patriarchy. Their legacy reminds us that true freedom is incomplete without gender justice and equal participation.

## Archaeological Survey of India (ASI)

### Context:

The Archaeological Survey of India (ASI) has come under criticism over its handling of the Keeladi excavations in Tamil Nadu and the controversial transfer of archaeologist K. Amarnath Ramakrishna.

### About Archaeological Survey of India (ASI)

### What it is

- The Archaeological Survey of India (ASI) is the apex government body responsible for archaeological research, conservation, and preservation of monuments and heritage sites in India.
- It functions under the Ministry of Culture, Government of India.

### Established in

- Founded in 1861 by Alexander Cunningham, regarded as the "Father of Indian Archaeology".
- Initially set up during the colonial era, later restructured post-Independence.

### Chaired by

- Headed by the Director General of Archaeology, appointed by the Government of India.

### Structure of Organisation

1. Headquarters – New Delhi.

2. Circles/Regional Units – Around 36 circles, each headed by a Superintending Archaeologist.
3. Specialised Wings – Epigraphy, Excavation Branches, Science Branch, Prehistory Branch, Museums Branch, Conservation Wing.
4. Subordinate Offices – Site museums, libraries, and research institutions under ASI's control.

### Functions and Powers

- Excavation & Exploration: Conduct systematic archaeological excavations and surveys across India.
- Monument Protection: Administer the Ancient Monuments and Archaeological Sites and Remains Act, 1958.
- Conservation & Preservation: Maintain more than 3,600 protected monuments, including UNESCO World Heritage Sites.
- Epigraphy & Numismatics: Study ancient inscriptions, coins, and manuscripts.
- Museums: Manage site museums showcasing excavated artefacts.
- Research & Publication: Publish annual reports, monographs, and surveys.
- Regulation & Control: Grant permissions for construction near protected monuments and regulate archaeological practices.
- International Cooperation: Collaborate with foreign archaeological missions and UNESCO in heritage management.

## Lokmanya Bal Gangadhar Tilak

### Context:

On the death anniversary of Lokmanya Bal Gangadhar Tilak, Union Home Minister paid tribute, highlighting his role in transforming Swaraj into a mass movement.

### About Bal Gangadhar Tilak:

### Who He Was?

- Known as Lokmanya Tilak, he was a revolutionary nationalist, journalist, scholar, and freedom fighter.
- Famously called the "Father of Indian Unrest" by British colonial authorities.

### Background:

- Born: July 23, 1856, in Ratnagiri, Maharashtra.
- Education: Studied at Deccan College, Pune. Graduated with a B.A. and LL.B.
- Co-founded Deccan Education Society and Fergusson College to promote Indian-run education.

### Contributions to the Freedom Movement:

1. Swaraj as Birthright: Popularised the slogan "Swaraj is my birthright and I shall have it."
2. Newspapers: Founded Kesari (Marathi) and The Mahratta (English) to educate and mobilise the public.
3. Cultural Nationalism: Revived Ganesh Utsav (1893) and Shivaji Jayanti as tools of mass mobilisation and Hindu unity.
4. Extremist Phase Leader: Led the Lal-Bal-Pal trio (with Lala Lajpat Rai and Bipin Chandra Pal) during the assertive phase of nationalism.
5. Writings and Scholarship: Authored 'Gita Rahasya', 'Arctic Home in the Vedas', and 'Orion', showcasing his command over history, religion, and astronomy.
6. Home Rule Movement (1916): Collaborated with Annie Besant to launch the Home Rule League, demanding self-governance within the British Empire.

### Controversies and Imprisonment:

### Sedition Charges:

- Imprisoned multiple times for writings that incited resistance against British rule.
- Most notably jailed in 1897 and 1908 for inciting rebellion through his journalistic work.

### Differences with Moderates:

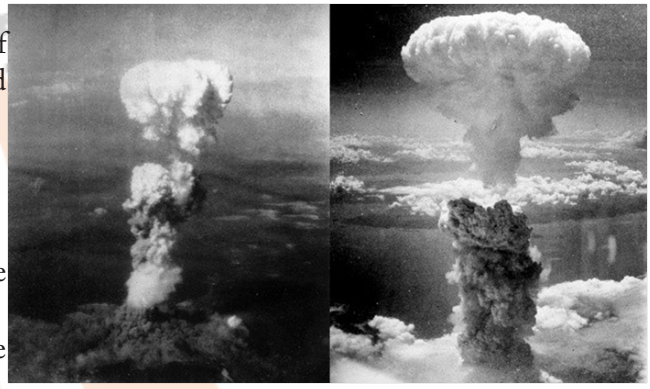
- Advocated direct action and opposed the moderate methods of prayer and petition during the split in the Surat session (1907) of INC.

### Death:

- Died: August 1, 1920, in Mumbai.
- His death marked the end of an era, but his ideals continued to inspire the non-cooperation and civil disobedience movements.

## Atomic bombing on Hiroshima and Nagasaki

### Context:



August 2025 marks 80 years since the atomic bombings of Hiroshima and Nagasaki, which ended World War II and began the nuclear age.

### About Atomic bombing on Hiroshima and Nagasaki:

### The Pearl Harbor Attack: The Beginning of Hostilities

- On 7 December 1941, Japan launched a surprise attack on the Pearl Harbor naval base in Hawaii.
- Over 2,400 Americans were killed, and much of the Pacific fleet was damaged or destroyed.
- This attack led to the United States' formal entry into World War II the next day.
- It shifted American public opinion decisively and laid the foundation for a no-compromise strategy against Japan.

### Context Leading to the Bombings:

### Brutality and Stalemate in the Pacific:

- The Pacific theatre saw fierce island-hopping battles: Guadalcanal, Iwo Jima, and Okinawa.
- The Battle of Okinawa (April–June 1945) alone caused over 200,000 casualties — signalling how costly a land invasion of Japan would be.

### Japanese Resistance to Surrender:

- Despite catastrophic losses and conventional bombings (e.g., Tokyo firebombing in March 1945), Japan refused unconditional surrender.
- The Potsdam Declaration (July 1945) warned Japan of "prompt and utter destruction" if it did not surrender.
- Japan's leadership was divided: Emperor Hirohito may have sought peace, but military hardliners resisted.

### The Manhattan Project and Bomb Readiness:

- The Manhattan Project had secretly developed atomic weapons since 1942.
- The Trinity Test (16 July 1945) in New Mexico proved successful.
- The U.S. now had a powerful weapon that could potentially end the war swiftly.

### The Bombings:

- Hiroshima – 6 August 1945
- Bomb: "Little Boy" (uranium-based)
- Dropped by: B-29 Enola Gay
- Immediate deaths: Approx. 80,000; total deaths by end of 1945: ~140,000
- Targeted due to its military-industrial significance
- Nagasaki – 9 August 1945
- Bomb: "Fat Man" (plutonium-based)
- Targeted after cloud cover blocked Kokura
- Immediate deaths: Approx. 40,000; total by end of 1945: ~73,000

## Key Reasons Behind the Decision:

### To Avoid a Bloody Land Invasion:

- Operation Downfall (planned invasion of Japan) was expected to cause up to 1 million Allied casualties.
- The bomb was seen as the lesser evil to end the war quickly and save lives on both sides.

### To Shock Japan into Surrender:

- Conventional bombings and blockades hadn't worked.
- The sheer psychological devastation was intended to force a surrender from the Japanese military leadership.

### To Contain Soviet Influence:

- The USSR declared war on Japan on 8 August 1945, fulfilling a Yalta Conference promise.
- The U.S. feared Soviet advances into Japanese territory.
- Demonstrating the atomic bomb's power served as a geopolitical warning — marking the beginning of Cold War posturing.

### Justification for Manhattan Project:

- The U.S. had invested $2 billion in secret research.
- Not using the bomb might have been hard to justify domestically and diplomatically.

## Immediate Consequences:

### Japanese Surrender:

- Japan communicated willingness to surrender on 10 August 1945; accepted terms on 14 August 1945.
- 2 September 1945: Formal surrender signed on USS Missouri, ending World War II.

### Birth of the Nuclear Age:

- Nuclear weapons became central to post-war security doctrines.
- The world entered an era of Mutual Assured Destruction (MAD) during the Cold War.

### Long-Term Implications:

- Nuclear Proliferation: Spurred arms races (USA–USSR), NPT debates, and modern concerns over rogue states.
- Strategic Doctrine: Introduced the concept of deterrence through overwhelming power.
- International Law: Influenced formation of Geneva Conventions and ICRC protocols.
- Ethics of War: Sparked enduring debates on civilian protection, proportionality, and wartime responsibility.

## Conclusion:

The atomic bombings were not merely acts of military force but a convergence of strategic necessity, political calculus, scientific breakthrough, and moral compromise. While they brought a quick end to a devastating global war, they opened a Pandora's box of nuclear fear, ethical dilemmas, and geopolitical tensions that defined the 20th century — and continue to shape the 21st.

## PM SVANidhi Scheme

### Context:

The Union Cabinet has approved restructuring of the PM SVANidhi Scheme with an extension of the lending period till 31 March 2030.


### About PM SVANidhi Scheme:

### What it is?

- PM Street Vendor's Atma Nirbhar Nidhi (PM SVANidhi) is a micro-credit scheme for urban street vendors.
- It provides affordable working capital loans to restore livelihoods disrupted during COVID-19.

### Launched in

- June 1, 2020 by the Ministry of Housing and Urban Affairs (MoHUA).

### Aims and Objectives

1. Provide collateral-free working capital loans to street vendors.
2. Promote digital payments and financial inclusion.
3. Help vendors resume businesses post-pandemic and integrate with the formal economy.
4. Encourage credit discipline by incentivising timely repayments.

### Nodal Agency

- Implemented by the Ministry of Housing and Urban Affairs (MoHUA) with State/UT governments, Urban Local Bodies, and lending institutions.

### Key Features (Original Framework)

- Initial Loan: 10,000 collateral-free loan (first tranche).
- Interest Subsidy: 7% per annum subsidy on timely repayment.
- Digital Incentives: Cashback of up to 100 per month for digital transactions.

- Credit Linkage: Higher loan tranches available on successful repayment.
- Target Beneficiaries: Street vendors in statutory towns, including those operating through carts, stalls, and footpaths.

### Recent Restructuring (2025)

1. Extended Lending Period: Now valid till 31 March 2030 (earlier 31 Dec 2024).
2. Enhanced Loan Amounts:
   - 1st tranche: 15,000 (earlier 10,000).
   - 2nd tranche: 25,000 (earlier 20,000).
   - 3rd tranche: 50,000 (unchanged).
3. UPI-linked RuPay Credit Card: For vendors repaying second tranche, providing instant access to credit for business and personal needs.
4. Cashback Incentives: Vendors can earn up to 1,600 annually on retail/wholesale digital transactions.
5. Expanded Coverage: Beyond statutory towns, now includes census towns and peri-urban areas.
6. Scale of Beneficiaries: Aims to benefit 1.15 crore vendors, including 50 lakh new entrants.

## Samudrayaan Project

### Context:

Two Indian aquanauts recently dived over 5,000 metres in the Atlantic Ocean aboard the French submersible Nautile, as part of training for India's Samudrayaan Project.


### About Samudrayaan Project

### What it is

- India's first manned deep-sea mission under the Deep Ocean Mission (DOM) approved in 2021.
- It seeks to explore the ocean at depths up to 6,000 metres for resources, biodiversity, and scientific research.

### Established in

- Approved by the Union Cabinet in 2021, with an outlay of 4,077 crore for five years.

### Aims and Objectives

1. Develop deep-sea technologies – crewed submersibles, mining tools, and robotic vehicles.
2. Survey ocean resources – locate polymetallic nodules rich in manganese, cobalt, nickel, and rare earths.
3. Advance climate research – create ocean climate advisory models for projections.
4. Strengthen blue economy – support sustainable harnessing of marine resources.
5. Enhance biodiversity conservation – study and protect fragile deep-sea ecosystems.

### Features

- Vehicle: Matsya-6000, a crewed submersible resembling a large fish.
- Capacity: Three aquanauts, 12-hour missions (96 hours in emergency).
- Personnel sphere: 2.1 m diameter, built from 80 mm titanium alloy, fabricated via electron beam welding by ISRO.
- Communication: Special acoustic telephone system developed indigenously.
- Life-support: Oxygen scrubbers and re-breather systems to recycle air.
- Depth capability: 6,000 metres, pressure resistance ~600 times sea level.

### Other Related Initiatives

- Deep Ocean Mission (DOM) – umbrella scheme with six components including Samudrayaan.
- Polymetallic Nodule Programme – India holds mining rights in the Central Indian Ocean Basin from the International Seabed Authority.

- National Institute of Ocean Technology (NIOT) – nodal agency for developing Matsya-6000.
- Blue Economy Policy – integrates ocean resources for economic and environmental goals.

## Promotion and Regulation of Online Gaming Bill, 2025

### Introduction

- The Promotion and Regulation of Online Gaming Bill, 2025, passed by Parliament, has triggered intense debate.
- The law imposes a complete ban on online money games, including both games of skill and chance, and prohibits advertising, promotion, and sponsorship of such platforms.
- The government justifies the ban citing gaming addiction, financial losses, mental health issues, fraud, and money laundering risks.

### Government's Rationale

### Public Health Concerns

- Online gaming addiction has been linked with anxiety, depression, and social withdrawal (Indian Journal of Psychiatry, 2023).
- WHO (2019) classified "gaming disorder" as a mental health condition.

### Financial Harms

- Users, especially youth, incur heavy debts through micro-transactions and betting.
- Middle- and lower-income families are disproportionately affected.

### Fraud and Money Laundering

- Investigations by the Enforcement Directorate revealed misuse of gaming platforms for hawala, cryptocurrency laundering, and Ponzi schemes.

### Arguments in Favour of the Ban

- Moral Responsibility of the State: Protect vulnerable groups from exploitative business models.
- Preventive Action: Ban reduces accessibility and immediate exposure to risky games.
- Consumer Protection: Prevent misleading advertising portraying gaming as a path to wealth.
- Uniform Law: Provides clarity amidst conflicting state-level regulations (e.g., Tamil Nadu vs. Karnataka HC rulings).

### Criticism of the Ban

### Ineffectiveness of Prohibitions

- Indian experience with liquor prohibition, cryptocurrency bans, and price controls shows bans often drive activity underground.
- Offshore and unregulated apps may continue, harder to monitor.

### Economic Implications

- PwC Report (2023): Real money gaming revenue was  16,500 crore; projected to reach  26,500 crore by 2028.

### Ban will affect:

- Startups & platforms (suspending operations already).
- Employment in gaming, animation, payments, and ancillary sectors.
- Investments — EY estimated  22,931 crore FDI and domestic inflows (2019–23) at risk.

### Fiscal Impact

- After the GST Council imposed 28% tax on online gaming, government revenues surged 412% in 6 months (  6,909 crore).
- Ban will eliminate this growing tax source.

## Policy Instability

- Frequent policy shifts create uncertainty, deterring long-term capital and innovation.

## Global Experiences

- China: Imposed strict limits (e.g., minors allowed gaming only 3 hours/week). Enforcement remains challenging, black markets thrive.
- USA: Differentiates games of skill vs. gambling, allows regulated fantasy sports with taxation.
- UK: Adopts a strict regulatory framework, requiring licensing, self-exclusion tools, and advertising codes.
- Singapore: Uses "sandbox regulation", balancing innovation with consumer safeguards.
- Lesson for India: Outright bans tend to fail; regulation, monitoring, and taxation yield better outcomes.

## Possible Alternatives to Blanket Ban

## Regulated Licensing

- Mandatory licenses for operators with compliance to IT Act, FEMA, and AML laws.

## KYC & Financial Safeguards

- Strict KYC, spending limits, and age restrictions.
- Integration with DigiLocker and Aadhaar-based identity verification.

## Awareness & Mental Health Support

- Digital literacy campaigns to warn about gaming addiction.
- Counseling and helplines for affected families.

## Grievance Redressal & Ombudsman

- Independent regulator to handle complaints swiftly.

## Differentiation of Games

- Allow fantasy sports and skill-based platforms under checks.
- Prohibit chance-based gambling that mimics casinos.

## Constitutional & Legal Dimensions

- Entry 34, State List (Seventh Schedule): Betting & gambling are state subjects. But online platforms blur jurisdiction.
- Article 19(1)(g): Right to trade, subject to reasonable restrictions.

## Judicial Precedents:

- Dr. K.R. Lakshmanan vs. State of Tamil Nadu (1996): Distinguished games of skill from gambling.
- Multiple HC rulings upheld fantasy sports as predominantly skill-based.
- The new law may face judicial scrutiny on grounds of proportionality.

## Multi-Dimensional Implications

- Social: Protects families from addiction but risks pushing gaming to underground networks.
- Economic: Hurts startups, jobs, tax revenues, and FDI prospects.
- Legal: May trigger constitutional challenges on right to trade.
- Technological: Slows growth in AI, AR/VR, and gaming ecosystem in India.
- Geopolitical: Offshore platforms may dominate, limiting India's regulatory influence.

## Way Forward

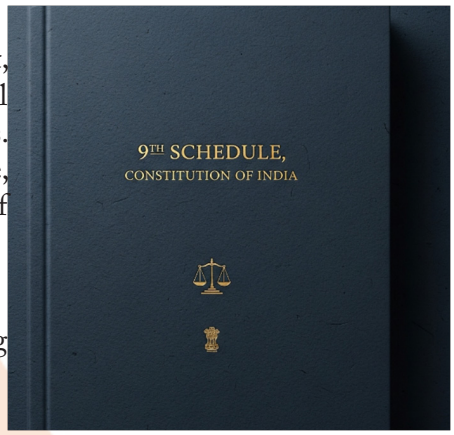
- Adopt a light-touch regulatory framework, as suggested by NITI Aayog (2020).
- Establish Central Online Gaming Authority to harmonize regulations across states.
- Introduce graded taxation, not outright bans.
- Encourage responsible gaming practices (self-exclusion, spending caps).
- Align with global best practices to balance innovation, revenue, and consumer protection.

### Conclusion

- The Promotion and Regulation of Online Gaming Bill, 2025 reflects a tough stance by the government to safeguard public health and finances.
- However, India's past with prohibition policies shows that bans rarely achieve intended outcomes. A balanced approach — combining regulation, taxation, awareness, and grievance redressal — is better suited for India's digital economy aspirations.
- The challenge lies in finding the middle path: protecting citizens without stifling innovation, revenue, and employment.

## Constitution's Ninth Schedule

### Context




The Ninth Schedule, introduced by the First Constitutional Amendment, 1951, was originally proposed by V.K. Thiruvenkatachari, Advocate General of Madras, to safeguard land reform laws from being struck down by courts. Over decades, it has become a flashpoint in the legislature–judiciary tussle, oscillating between enabling social justice reforms and risking erosion of constitutional liberties.

### Historical Context and Rationale

- The Patna High Court (1951) invalidated Bihar's land reforms, creating a deadlock between Parliament and judiciary.

### Responding, the First Amendment inserted:

- Article 31A – protecting agrarian reform laws from challenge.
- Article 31B & Ninth Schedule – granting blanket immunity to listed laws.
- Initially, 13 state laws (mostly on zamindari abolition) were placed in the Ninth Schedule, later expanding to over 280 laws.
- Political intent: to dismantle feudal hierarchies and uphold Directive Principles (Article 38, 39(b), 39(c)) on equitable distribution of resources.

### Judicial Evolution

- Sankari Prasad (1951): SC upheld the First Amendment and validity of the Ninth Schedule.
- Golaknath v. State of Punjab (1967): SC held Parliament could not amend Fundamental Rights—raising doubts over Ninth Schedule validity.
- Kesavananda Bharati (1973): Introduced the basic structure doctrine—Parliament cannot alter constitutional fundamentals.
- Waman Rao v. Union of India (1981): Draw a line—laws inserted in Ninth Schedule before 24 April 1973 upheld, later ones subject to scrutiny.
- I.R. Coelho v. State of Tamil Nadu (2007): Clarified that post-1973 Ninth Schedule laws are open to judicial review if they damage the basic structure.

### Positive Aspects

1. Agrarian Transformation: Enabled abolition of zamindari, benefiting millions of tenants (UP alone abolished 2 crore acres of landlord holdings by 1960).
2. Social Justice: Protected welfare measures like ceiling on landholdings, tenancy rights, and affirmative action laws.
3. Policy Certainty: Reduced litigations—by 1970s, over 50 land reform acts survived due to Ninth Schedule protection.
4. Constitutional Flexibility: Allowed democratic mandates to prevail over rigid colonial-era property rights.
5. Equity Orientation: Supported implementation of Directive Principles, aligning state action with social justice goals.

### Challenges

1. Legislative Overreach: By 2000s, Ninth Schedule held over 284 laws, many unrelated to agrarian reforms.
2. Erosion of Fundamental Rights: Blanket immunity undermined Articles 14, 19, and 21.
3. Judiciary–Legislature Conflict: Sparked recurring confrontations, especially after Kesavananda and Coelho.
4. Scope for Misuse: Governments used it to bypass scrutiny of politically expedient measures (e.g., TN reservation laws exceeding 69% cap).
5. Uncertainty in Application: Post-Coelho, ambiguity persists on how courts apply "basic structure" to welfare measures.

### Way Forward

1. Restrict Use: Confine the Ninth Schedule to genuine land and equity reforms, avoiding its use as a political shield.
2. Judicial Clarity: Courts should apply consistent tests under the basic structure doctrine to reduce uncertainty.
3. Legislative Restraint: Parliament must exercise self-discipline, using insulation sparingly and only after robust debate.
4. Safeguards: Introduce tools like sunset clauses or periodic review to prevent blanket, permanent immunity.
5. Balanced Approach: Legislature should advance social justice, while judiciary upholds constitutional values of equality, liberty, and rule of law.

### Conclusion

The Ninth Schedule was a bold innovation that enabled India's agrarian and social justice reforms. But its overuse risks undermining constitutional guarantees. Going forward, its use must remain narrow, restrained, and consistent with the basic structure, so that it continues to serve as a shield for reform without eroding rights.

## National Organ and Tissue Transplant Organisation (NOTTO)

### Context:

The National Organ and Tissue Transplant Organisation (NOTTO) has issued a direction giving priority in organ allocation to women patients and female relatives of deceased donors, addressing long-standing gender disparity.


### About National Organ and Tissue Transplant Organisation (NOTTO)

### What it is?

- Apex government body under the Ministry of Health and Family Welfare.
- Functions as the national coordination centre for organ and tissue donation/transplantation.
- Headquarters: Located in the Institute of Pathology (ICMR) Building, Safdarjung Hospital, New Delhi.

### Aim:

- To coordinate, regulate, and promote organ and tissue donation and transplantation in India.
- Facilitate the safe and efficient allocation and utilization of organs and tissues.

### Established in

- Formed in 2014, under the mandate of the Transplantation of Human Organs and Tissues Act, 1994 (amended 2011).

### Chaired by

- Operates under the Director General of Health Services (DGHS), MoHFW.

### Structure of Organisation

1. National Network Division – maintains a central registry of donors and recipients.

2. National Biomaterial Centre – tissue banking for corneas, bones, skin, etc.
3. Coordination with ROTTOs & SOTTOs – Regional and State-level bodies.

### Functions & Powers

- Maintain a national database of organ and tissue donations.
- Ensure transparent allocation through waiting lists.
- Issue guidelines & protocols for ethical transplantation.
- Train transplant coordinators & medical staff.
- Run awareness campaigns to increase voluntary donation.
- Support hospitals in setting up retrieval centres and trauma-linked donor facilities.
- Monitor compliance with THOA, 1994 to prevent organ trafficking or commercial trade.

## The Path to Ending Global Hunger Runs Through India

### Context:

The UN FAO's State of Food Security and Nutrition in the World 2025 report highlights a decline in global undernourishment to 8.2% (673 million people), with India playing a decisive role.

- India reduced its prevalence of undernourishment from 3% (2020–22) to 12% (2022–24), meaning 30 million fewer hungry people.

### About Hunger

### What is Hunger?

- Definition: Hunger refers to the condition of chronic undernourishment where individuals fail to obtain sufficient calories or nutrients to maintain health and productivity.

### It manifests in three forms:

1. Undernourishment: Calorie deficiency (not enough energy intake).
2. Malnutrition: Poor quality diet lacking protein and micronutrients.
3. Hidden Hunger: Micronutrient deficiency (iron, iodine, vitamin A, zinc).

### Causes Behind Hunger

### 1. Poverty and Inequality

- Poverty remains the biggest driver of hunger. Low incomes restrict household food access even when supply is available.
- Example: As per NITI Aayog's Multidimensional Poverty Index 2023, about 11.28% of India's population remains multidimensionally poor.

### 2. Agricultural Challenges

- Low productivity due to fragmented landholdings, erratic monsoons, and poor irrigation coverage.
- Post-harvest losses (13% of food output), as per FAO estimates, reduce food availability.

### 3. High Food Prices

- FAO notes the cost of a healthy diet in India remains unaffordable for 60% of the population.
- Inflation in pulses, fruits, vegetables, and protein-rich foods keeps nutrition out of reach for the poor.

### 4. Weak Infrastructure & Supply Chains

- Inadequate cold storage and poor logistics increase food wastage.
- India loses 92,000 crore annually in post-harvest losses (ICAR 2022 report).

### 5. Governance, Conflict & Climate Change

- Global hunger is worsened by conflicts (Ukraine war), pandemics (COVID-19), and climate shocks (floods, droughts).
- India too faces frequent climate-induced crop losses, affecting farmer income and food availability.

### 6. Health & Sanitation Issues

- Poor maternal health, open defecation, and lack of clean drinking water aggravate child malnutrition.
- NFHS-5 (2019–21): 35.5% of children under 5 are stunted, 19.3% are wasted.

## Consequences of Hunger

### 1. Human Capital Loss

- Children with stunting and wasting suffer poor learning outcomes and reduced adult productivity.
- Hunger perpetuates intergenerational poverty cycles.

### 2. Economic Burden

- Hunger costs nations billions in lost productivity and increased healthcare expenses.
- The Global Nutrition Report (2021) estimates malnutrition costs India 2–3% of GDP annually.

### 3. Health Risks

- Increases susceptibility to infections (TB, diarrhoea, anaemia).
- Micronutrient deficiencies lead to blindness (Vitamin A), poor immunity (zinc), and cognitive impairment (iodine deficiency).

### 4. Social Instability

- Food insecurity can trigger unrest, migration, and social tensions, as seen in multiple food riots globally.

### 5. Failure of SDGs

- Hunger directly blocks achievement of SDG 2 (Zero Hunger) and undermines progress on SDG 3 (Health), SDG 4 (Education), and SDG 8 (Decent Work).

## India's Role in Combating Hunger

### 1. Revamped Public Distribution System (PDS)

- Digitisation, Aadhaar authentication, and ONORC (One Nation One Ration Card) improved targeting.
- Provides subsidised grains to 800 million beneficiaries under NFSA & PMGKAY.

### 2. Nutrition-Specific Programmes

- PM POSHAN (2021): Expanded school meals into nutrition-sensitive interventions.
- ICDS & POSHAN Abhiyaan: Focus on dietary diversity, maternal and child health.
- Anaemia Mukt Bharat: Aims to reduce anaemia prevalence among women and children.

### 3. Digital and Technological Advantage

- e-NAM, AgriStack, Geospatial tools: Enhance farmer-market linkages and reduce food losses.
- Bhavishya & CPENGRAMS portals: Improve pensioners' food security and grievance redressal indirectly.

### 4. Agrifood System Transformation

- Promoting climate-resilient crops, Farmer Producer Organisations (FPOs), and women-led food enterprises.
- Expanding cold chains and logistics to reduce wastage.

### 5. Global Leadership

- India's scale of poverty reduction and hunger control contributes significantly to global SDG 2 progress.
- As FAO notes, India is a model for Global South countries, showcasing digital governance and mass food security interventions.

## Way Forward

### 1. Shift from Calories to Nutrition

- Fortify staple foods (rice, wheat, salt, edible oils).
- Subsidise protein-rich foods like pulses, milk, and eggs.

### 2. Strengthen Infrastructure

- Expand cold chains, warehouses, and farmer cooperatives to reduce 92,000 crore post-harvest losses.

### 3. Affordable Diets

- Ensure access to fruits, vegetables, and animal-source foods for low-income families.
- Use DBT subsidies for nutrient-rich foods.

### 4. Empower Small Farmers & Women Enterprises

- Scale up FPOs, SHGs, and women-led agribusinesses.
- Promote cultivation of climate-smart, biofortified crops.

### 5. Tackle Malnutrition & Obesity Together

- Double-duty policies: Address both undernutrition and rising obesity in urban poor.
- Expand nutrition literacy campaigns at schools and workplaces.

### 6. Global Knowledge Sharing

- Share India's models like ONORC, PDS digitalisation, and nutrition schemes with other developing nations.

### Conclusion

India has emerged as a symbol of hope in global hunger reduction. The shift from mere calorie security to nutrition, resilience, and agrifood system transformation is crucial. With only five years left for the 2030 SDGs, India's leadership will determine whether the world can realistically achieve Zero Hunger.

## Water-Scarce Districts in India

### Context:

The Government released the latest data on water-scarce districts, identifying 193 districts as over-exploited, critical, or semi-critical.

### About Water-Scarce Districts in India:

### What are They?

- Districts where groundwater extraction exceeds recharge or where water availability is critically low.

### Classified by Central Ground Water Board (CGWB) as:

- Over-exploited (102 districts)
- Critical (22 districts)
- Semi-critical (69 districts)

### Trends in India:

- Rising Stress: Increasing urbanisation, agriculture, and industrial demand have deepened water stress.
- Geographic Spread: States like Punjab, Haryana, Rajasthan, Tamil Nadu, and Karnataka face the highest pressure.
- Jal Shakti Abhiyan (2019–2025): Mission-mode campaign covering water-stressed and high-priority districts with themes like "Catch the Rain" and "Nari Shakti se Jal Shakti".

### Significance:

- Drinking Water Security: Protects rural and urban populations from shortages.
- Climate Adaptation: Strengthens resilience against droughts and erratic rainfall.
- Policy Planning: Provides evidence for Jal Jeevan Mission, Atal Bhujal Yojana, and SDG-6 (Clean Water and Sanitation).

# CEC Removal Process

## Context:

The Opposition is considering an impeachment motion against Chief Election Commissioner (CEC) Gyanesh Kumar.

## About CEC Removal Process:

### What is it?

- The CEC is a constitutional authority under Article 324 of the Indian Constitution.
- Removal safeguards are designed to ensure independence and neutrality of the Election Commission.
- CEC can only be removed in the same manner and on the same grounds as a Supreme Court Judge.

### Procedure of Removal:

### Grounds:

- Proved misbehaviour includes corruption, abuse of office, or failure to discharge duties.
- Incapacity inability to perform constitutional functions.

### Initiation:

- A motion alleging misbehaviour/incapacity is introduced in either House of Parliament.
- Requires support of at least 50 MPs for admission.
- Inquiry: A judicial inquiry committee examines the evidence and validates the charges.
- Voting in Parliament: Motion must be passed by a two-thirds majority of members present and voting in both Houses.
- Presidential Action: Once Parliament approves, the President orders removal; no discretion remains.
- Other Election Commissioners: Can only be removed on recommendation of the CEC, further strengthening institutional independence.

### History of Removal:

- No CEC has ever been removed since independence.
- The high constitutional threshold has worked as a protective shield against political interference.

# Nominations to Union Territory Assemblies

## Context:

The Union Home Ministry recently informed the J&K and Ladakh High Court that the Lieutenant Governor (LG) can nominate five members to the Jammu & Kashmir Legislative Assembly without requiring the aid and advice of the Council of Ministers.

## About Nominations to Union Territory (UT) Assemblies

### What is it?

- Nomination to UT Assemblies refers to the constitutional and statutory provisions by which certain members are appointed, not elected, to serve in the legislature.
- These members usually represent specific communities, migrants, women, or expert domains.

### Constitutional Context

- Parliament & States: The Constitution earlier allowed Anglo-Indian nominations (discontinued in 2020). Rajya Sabha has 12 nominated members by the President. State Legislative Councils allow 1/6th nominated members by the Governor.
- Union Territories: As UTs are directly administered by the Union, their Assemblies are governed by Parliamentary statutes rather than constitutional provisions applicable to States.

### Nomination Procedure

### Jammu & Kashmir:

### Under Section 14, J&K Reorganisation Act, 2019 (amended 2023):

- 90 elected seats.
- LG may nominate up to five members — two women, two Kashmiri migrants, and one displaced person from PoK.

### Puducherry:

### Under Section 3, Government of Union Territories Act, 1963:

- 30 elected members.
- The Central Government may nominate up to three members.

### Delhi:

### Under Section 3, GNCTD Act, 1991:

- 70 elected members only.
- No provision for nominated MLAs.

### Judicial Interpretation

- Puducherry Case (K. Lakshminarayanan, 2018): Madras High Court upheld Centre's power to nominate MLAs; no need for UT Government's advice. The Supreme Court later upheld this.

- Delhi Case (NCT of Delhi v. Union, 2023): SC articulated the "triple chain of command"—civil servants ministers legislature electorate; emphasised LG must act on the aid and advice of Council of Ministers, except where legislature lacks power.

### How UT Nominations Differ from States

4. Authority: In States, Governors act on the advice of the elected Council of Ministers. In UTs, nominations often flow directly from the Union Government or LG.
4. Autonomy: States enjoy constitutional status; UT Assemblies derive powers from Acts of Parliament.
5. Democratic Balance: In smaller UT Assemblies like Puducherry or J&K, nominated members may tilt legislative majority — unlike in larger State legislatures.
6. Judicial Stance: Courts have upheld the Centre's primacy in UT nominations, limiting the role of local elected governments.

## India's unique genetic legacy

### Context:

A recent Cell study revealed India's unparalleled genetic diversity—stemming from ancient migrations, interbreeding with archaic humans, and centuries of endogamy—has profound implications for health, ancestry mapping, and personalised medicine.

### About India's Unique Genetic Legacy:

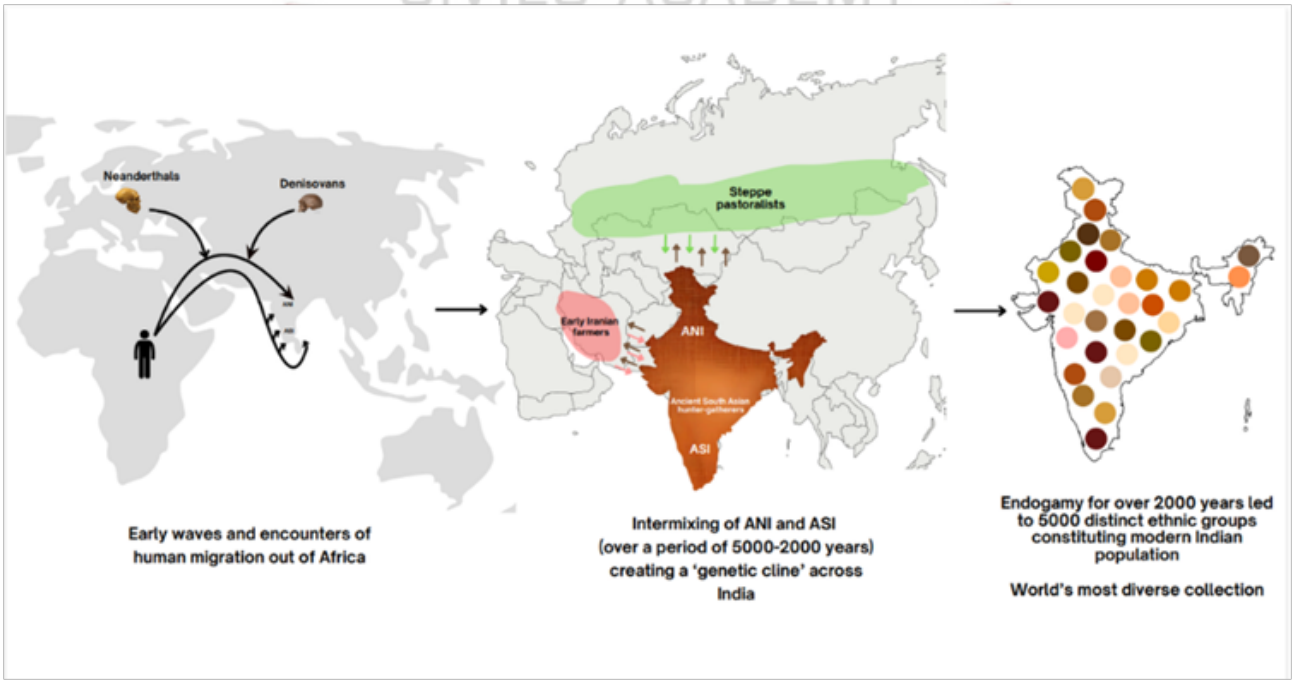
- Definition – India's genetic wealth arises from ancient migrations, mixing with Neanderthals and Denisovans, and the practice of marrying within defined social groups (endogamy). This heritage makes it a living archive of evolutionary history.

### Key Features:

- Over 5,000 ethnic groups each have distinct DNA signatures, reflecting millennia of isolation and adaptation.
- Founder mutations—rare genetic changes preserved within communities—are highly prevalent due to limited gene flow.
- Holds millions of rare variants that influence disease resistance, metabolism, and environmental adaptation.
- Positions India to lead in personalised medicine and global genomics research.

### Charting India's Genetic Landscape:

- The first settlers from Africa (~50,000 years ago) formed the core population, later enriched by diverse ancient gene flows.
- Genetic blending between Ancestral North Indians (ANI) and Ancestral South Indians (ASI) created a distinct Indian genome.
- Inputs from hunter-gatherers, Iranian farmers, and Steppe herders added complexity to the genetic fabric.
- Despite this richness, India is poorly represented in global genome projects, limiting medical and historical insights.



### Endogamy and Genetic Diseases:

- Preservation & Similarity – Endogamy maintained ancient genetic traits but also increased relatedness within groups, concentrating certain genetic patterns.
- Founder Effects – This led to stronger founder events and higher identical gene copies compared to most global populations.
- Rare Disorders – Community-specific rare diseases, like butyrylcholinesterase deficiency in the Vysya community, are far more prevalent.
- Unique Variants – Large-scale genome mapping identified over 1.6 lakh unique variants linked to congenital, metabolic, and neurological conditions.

### India's Genetic Mosaic:

- Natural Genetic Labs – Each community functions as an isolated genetic repository, preserving rare variants for centuries.
- Research Opportunity – Enables direct study of natural gene functions without lab-induced mutations.
- Medical Innovation – Opens pathways for novel drugs, targeted disease prevention, and personalised treatment protocols.
- Economic Impact – Strengthens public health systems while boosting India's biotech and pharmaceutical competitiveness.

### Future Perspectives:

- Scaling Genome Sequencing – Extend genome mapping to millions, capturing diversity across geography and disease categories.
- National Biobank – Build a comprehensive, long-term health data repository, modeled on the UK Biobank, for research and healthcare planning.
- Genomics in Healthcare – Integrate genetic screening into public health policy for early detection and customised treatment.
- Global Leadership – Position India as a key hub for genome-driven innovation, attracting biotech and pharmaceutical investment.

### Conclusion:

India's genetic diversity is both a scientific treasure and a public health imperative. Harnessing it requires large-scale sequencing, ethical frameworks, and inclusive healthcare strategies. With the right investments, India can become a global epicentre for genomics-led innovation.

## Legal Aid and NALSA

### Context:

As per the India Justice Report 2025, only 15.5 lakh people availed legal aid in 2023–24, despite nearly 80% of India's population being eligible. This reveals persistent gaps in NALSA's reach, budget utilisation, and service quality.

### About Legal Aid and NALSA:

### What it is?

- The National Legal Services Authority (NALSA) is the apex statutory body under the Legal Services Authorities Act, 1987, mandated to provide free and competent legal services to the weaker sections of society.
- Launched in: Formally constituted in 1995, with the Chief Justice of India as Patron-in-Chief.

### Powers & Functions:

- Lays down policies and principles for legal aid delivery across India.
- Supervises and funds State Legal Services Authorities (SLSAs) and District Legal Services Authorities (DLSAs).
- Organises Lok Adalats, legal awareness campaigns, and supports ADR mechanisms.
- Ensures legal aid to eligible persons under Section 12 of the Act, including SCs/STs, women, children, disabled, poor, and prisoners.

## Key Initiatives Taken by NALSA:

- Legal Aid Defence Counsel (LADC) Scheme (2022): Dedicated defence for accused persons across 610 districts.
- Para-Legal Volunteers (PLVs): Trained community legal workers for outreach, awareness, and local dispute resolution.
- Permanent Lok Adalats: For pre-litigative and pending dispute settlement with focus on conciliation.
- Legal Literacy Clubs: Initiated in schools and colleges to foster early legal awareness.
- Jail Legal Aid Clinics: Legal support to undertrial and convicted prisoners.
- Special Schemes: Legal aid for transgender persons, disaster victims, industrial workers, and custodial populations.

**Legal Aid Defence Counsel (LADC) Scheme**

- Launched in 2022: Dedicated legal aid for accused persons, modelled on the public defender system
- Operational in 610 districts and ₹200 crore fully utilised in 2023-24
- Allocation reduced to ₹147.9 crore in 2024-25, raising sustainability concerns
- Potential: Can decongest overburdened court-assigned systems, but still early for measurable outcomes

## Challenges Faced by NALSA:

- Budget Constraints: Legal aid gets <1% of the total justice budget and NALSA's own funds declined from 207 crore (2017–18) to 169 crore (2022–23).
- Underutilisation of Funds: Utilisation dropped from 75% to 59% due to rigid expenditure restrictions.
- Shrinking Frontline: PLV density fell by 38% (2019–2024) and many States pay honorariums below minimum wage.
- Uneven Access: Only one legal aid clinic per 163 villages and per capita spending ranges from 2 to 16.
- Service Quality & Trust Deficit: Legal aid recipients often perceive services as inferior to private counsel.
- Centralised Fund Control: SLSAs need prior approval for basic expenditures like staff hiring or outreach logistics.

## Way Ahead:

- Enhance Fiscal Allocation: Mandate minimum 2–3% of the justice budget for legal aid, with flexible spending autonomy.
- Strengthen PLV System: Ensure minimum honorarium, performance-based deployment, and regular training.
- Decentralise Decision-Making: Delegate operational authority to DLSAs for swift fund usage at the grassroots.
- Digital Monitoring: Launch a nationwide portal to track legal aid delivery, pendency, and accountability metrics.
- Expand LADC & Lok Adalats: Scale successful models with independent evaluations and focus on underrepresented regions.

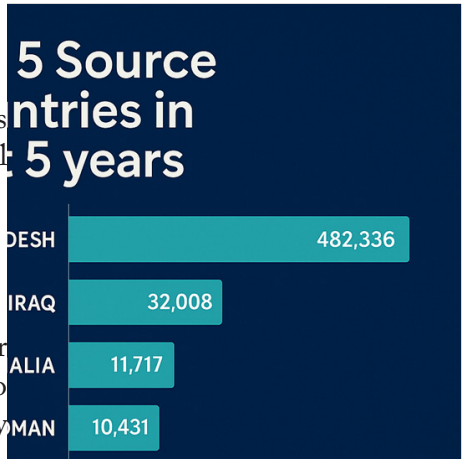
## Conclusion:

NALSA embodies India's constitutional commitment under Article 39A to ensure justice for all, irrespective of socio-economic status. However, persistent budgetary, administrative, and delivery bottlenecks hinder its full potential. Strengthening legal aid must become a governance priority to uphold the rule of law and foster inclusive justice.

# Medical Tourism in India

## Context:

India witnessed 1.31 lakh foreign tourist arrivals (FTAs) for medical purposes between January and April 2025, highlighting a sharp surge in medical tourism as per data from the Ministry of Tourism.




## About Medical Tourism in India:

### What is Medical Tourism?

- Medical tourism refers to the practice of people travelling to another country to obtain medical treatment—ranging from surgeries to wellness therapies—often due to affordability, quality, or availability of procedures.

### Key Trends:

- FTAs for medical reasons in Jan–Apr 2025: 1,31,856 (4.1% of total FTAs).
- Top source countries (2024): Bangladesh (4.8 lakh), Iraq, Somalia, Oman, and Uzbekistan.
- 2024 total medical FTAs: 6.44 lakh (up from 1.82 lakh in 2020).

### Government efforts:

- 'Heal in India' initiative by the Ministry of Health and Family Welfare.
- e-Medical Visa extended to 171 countries.
- Public-private partnerships to integrate hospitals, facilitators, hotels, and airlines.
- State-level initiatives: Gujarat promoting wellness retreats, training staff, and showcasing infrastructure globally.

## Digital Push in Education: Access, Equity, and Empathy at the Crossroads

### Context:

Recent reports have highlighted the increased integration of AI and digital devices in classrooms — including rural anganwadis — and the digitisation of administrative processes such as pension disbursement for army veterans.

### About Digital Push in Education: Access, Equity, and Empathy at the Crossroads:

### Background:

- Digital Transformation in Education: NEP 2020 envisions technology-enabled learning through platforms like DIKSHA, SWAYAM, and AI-based tools.
- AI in Early Learning: Experiments in rural preschools introduce interactive boards and VR devices to children under three years.
- Digitisation in Administration: Initiatives like SPARSH for defence pensions and centralised admission portals for higher education aim for streamlined processes.
- While these are steps towards a "Digital India", they raise concerns over equity, pedagogical soundness, and empathy in service delivery.

### Opportunities of Digital Integration:

- Bridging Geographic Barriers: Students in remote areas can access quality lectures, resources, and interactive content without relocation.
- Transparency in Processes: Centralised portals for admissions and pensions reduce discretion, enhancing accountability.
- Alignment with Future Skills: Digital exposure prepares students for a technology-driven job market and higher education requirements.
- Faster Administrative Services: Automation reduces delays in pension disbursal, admissions, and certification processes.
- Scalable Solutions: Once developed, digital platforms can serve millions without proportionate increases in cost.

### Challenges and Cracks Emerging:

- Digital Divide: Unequal access to devices and internet services excludes rural and economically weaker students.
- Pedagogical Disconnect: AI and VR may replace hands-on, sensory learning in early education, affecting cognitive development.
- Loss of Teacher–Student Bond: Over-reliance on screens can erode the relational trust and empathy crucial for early learning.

- Administrative Complexity: Veterans and first-generation learners often struggle to navigate complex portals and data entry requirements.
- Psychological Fatigue: Prolonged digital exposure may cause stress, reduced attention span, and disengagement in learners.

### Ethical and Governance Dimensions:

- Equity in Education: Policies must ensure that tech adoption does not deepen socio-economic disparities.
- Teacher Autonomy: Excessive standardisation can undermine educators' freedom to adapt teaching methods to student needs.
- Right to Holistic Learning: Article 21A implies access to not just digital content but also emotional and social learning experiences.
- Empathy in Governance: Digital governance must consider human support mechanisms for those struggling with technology.
- Informed Consent and Data Privacy: Collecting student data through ed-tech tools must respect privacy norms and informed consent.

### Way Forward:

- Hybrid Model of Learning: Blend digital tools with traditional teaching to retain relational learning while enhancing access.
- Strengthen Digital Infrastructure: Expand broadband connectivity and device access in rural and underserved areas.
- Teacher Training: Provide structured training for educators to integrate technology without losing pedagogical depth.
- Simplified Digital Interfaces: Design user-friendly portals with multilingual support and offline help desks.
- Regular Impact Audits: Monitor and evaluate the effects of digital adoption on learning outcomes and inclusivity.

### Conclusion:

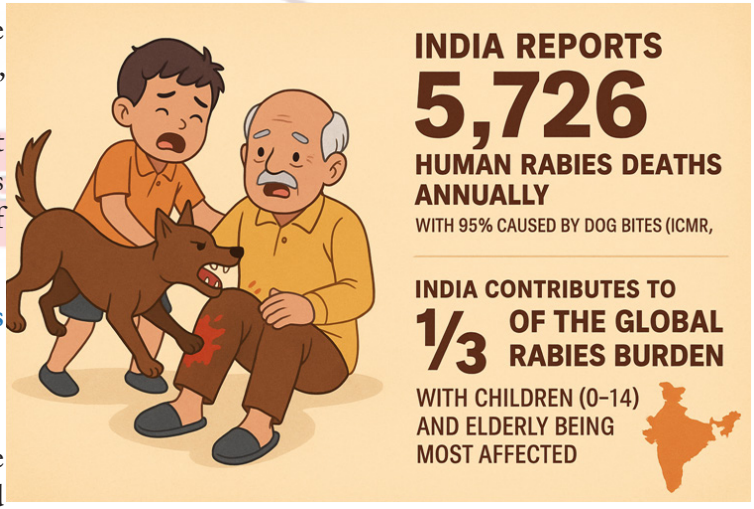
A balanced digital transformation must preserve the human touch in education while enhancing reach and efficiency. In India's diverse socio-economic context, inclusion and empathy must be the guiding principles of all tech-driven reforms.

## SC Orders Removal of Free-Ranging Dogs from Delhi-NCR Localities

### Context:

The Supreme Court of India, directed immediate removal of all free-ranging dogs from Delhi, Noida, Gurugram, and Ghaziabad.

- The apex court ordered their permanent relocation to shelters to curb rabies cases and dog-bite incidents, prioritising safety of children and vulnerable citizens.




### About SC Orders Removal of Free-Ranging Dogs from Delhi-NCR Localities:

### SC Order on Stray Dogs:

- Complete Removal: Authorities must capture all stray dogs in Delhi, Noida, Gurugram, and Ghaziabad, ensuring none are left roaming in public areas. This is aimed at creating stray-free streets in both core and peripheral urban zones.
- No Release Policy: Captured dogs will be kept in shelters permanently, ending the earlier practice under ABC rules of releasing them back into their original localities. This intends to permanently break the cycle of repeated attacks.
- Shelter Expansion: The SC mandated building facilities with capacity for 5,000 dogs within eight weeks,

starting with the most vulnerable localities. This ensures adequate housing and avoids overcrowding of captured animals.

- Rapid Response Helpline: A 24×7 helpline must be set up so that any reported dog bite case is acted upon within four hours. This provides immediate intervention to protect public health and safety.
- Strict Compliance: Any person or organisation obstructing the removal process will face contempt of court. This gives the order enforceability and deters interference from interest groups.

## Rationale Behind the Order:

- Public Safety Priority: Rabies kills around 5,700 people annually in India, with over 95% of cases linked to dog bites. The order is meant to directly reduce this preventable mortality.
- Child Protection: Children under 14 and the elderly over 60 face higher attack risks due to limited defence capacity. The court prioritised their safety as a moral and legal obligation.
- Policy Ineffectiveness: The Animal Birth Control model focuses on sterilisation but doesn't stop already aggressive or rabies-carrying dogs from harming people. Hence, immediate removal was deemed necessary.
- Right to Safe Mobility: Article 21 of the Constitution guarantees citizens the right to life and personal liberty. Stray attacks violate this right by creating fear in public spaces.
- Permanent Structural Reform: The court's directive shifts from temporary containment to permanent removal from public areas. This aims to create a long-term, sustainable solution rather than periodic crackdowns.

## Arguments in Favour:

- Life-Saving Measure: Upholds the ethical principle of beneficence by preventing avoidable rabies deaths, fulfilling the State's moral duty of care to its citizens.
- Safer Public Spaces: Reinforces the right to security under Article 21, fostering public trust and enabling citizens to exercise their freedom of movement without fear.
- Accountability System: Use of CCTV and records reflects transparency and procedural fairness, key pillars of good governance ethics.
- Closing Loopholes: Eliminates the ABC return-to-locality gap, embodying the principle of consequentialism by focusing on effective outcomes rather than procedural symbolism.
- Urban Governance Boost: Aligns with public health ethics and the common good approach, integrating safety and sanitation into urban policy priorities.

## Arguments Against:

- Possible Law Conflict: Risks violating the rule of law and legal certainty by potentially conflicting with existing ABC Rules under the Prevention of Cruelty to Animals Act.
- Shelter Overcrowding Risk: May compromise animal welfare ethics if infrastructure lags, leading to inhumane living conditions and moral negligence.
- Animal Welfare Concerns: Could be perceived as infringing on the intrinsic rights of animals, raising questions under environmental and compassion ethics.
- Ecological Impact: Sudden removal might breach the principle of ecological balance, as strays contribute to rodent control and waste reduction.
- Risk of Abuse: Without robust oversight, this policy risks moral hazard, enabling covert culling or cruelty under the guise of enforcement.

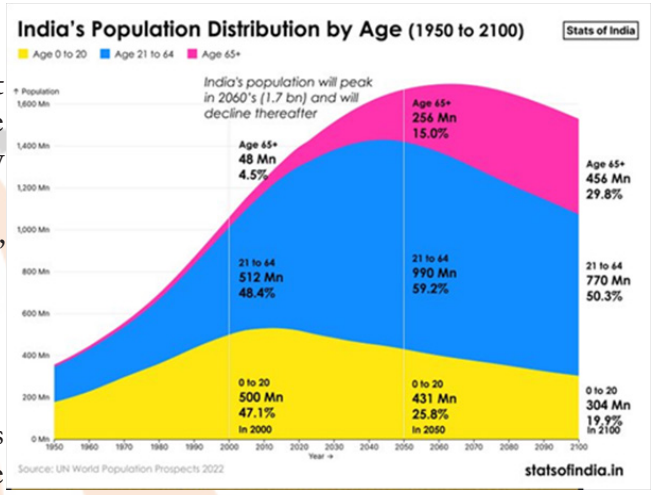
## Way Ahead:

- Humane Shelters: Design with adequate space, nutrition, and medical care to respect the dignity of sentient beings in line with animal ethics.
- Mass Vaccination: Implement large-scale drives as part of the preventive ethics approach to eliminate rabies without mass displacement alone.
- Controlled Adoption: Encourage adoption with strict vetting to balance compassion ethics with responsible stewardship.
- Policy Reform: Amend ABC Rules to align with SC directions, ensuring coherence between legal mandates and ethical imperatives.
- Awareness Drives: Promote community understanding of rabies prevention, invoking civic responsibility and the ethics of care.

## Conclusion:

The Supreme Court's order shifts urban governance towards prevention, prioritising safety while balancing public health with humane animal care. Success depends on legal clarity, strong infrastructure, and public engagement.

## India's demographic dividend as a time bomb




### Context:

India's demographic dividend, once seen as its greatest economic strength, is now being described as a potential time bomb due to rising automation, outdated curricula, and low employability among graduates.

- Experts warn that without urgent skilling reforms, India's youth bulge could turn into a liability.

### About Demographic Dividend

### What it is?

- It refers to the economic growth potential that arises when a country has a larger share of working-age population compared to dependents.
- This window is time-bound and requires productive employment to realise the benefits.

### India's Position

- India has over 800 million people below 35 years — the largest youth population in the world.
- The demographic dividend window is expected to remain open till 2045, giving India about two decades to harness this advantage.

### Significance

1. Boost to GDP – IMF estimates closing the gender gap alone could raise GDP by 27%.
2. Global Workforce Supplier – India can provide skilled labour to ageing economies.
3. Innovation Hub – Young population can drive entrepreneurship and digital adoption.
4. Export Competitiveness – Labour-intensive industries (textiles, leather, gems) depend on youthful manpower.
5. Social Development – Productive employment improves poverty reduction, social mobility, and inclusive growth.

### Key Concerns

1. Skill Gap – Only 43% of Indian graduates are job-ready (Graduate Skills Index 2025).
2. Education Mismatch – 40–50% of engineering graduates remain unemployed due to poor alignment with industry.
3. Automation Risks – McKinsey projects 70% of jobs at risk from AI by 2030.
4. Low Female Participation – Female Labour Force Participation Rate (FLFPR) remains at 37–41.7%, below global averages.
5. Career Awareness Deficit – 93% of students know only 7 career options, ignoring over 20,000 available paths.

### Consequences of Inaction

- Economic Fragility – Jobless growth, falling exports, and underutilisation of youth potential.
- Social Unrest – Risk of protests and instability, similar to the Mandal agitation of 1990.
- Missed Opportunity – India may fail to replicate China or Japan's success in leveraging demographic windows.
- Brain Drain – Skilled youth may migrate, weakening domestic innovation capacity.

## Way Forward

1. Curriculum Overhaul – Embed AI, digital literacy, and critical thinking in schools.
2. National Skilling Framework – Align education, skills, and industry through one cohesive plan.
3. Women-Centric Policies – Childcare, safe transport, and flexible work models to raise FLFPR.
4. Career Guidance at Scale – Mandatory counselling and exposure to modern job markets in schools.
5. Leverage Technology – Use AI-driven learning platforms for re-skilling and cross-skilling.
6. Public–Private Partnerships – Collaborate with industry for apprenticeships and gig economy formalisation.
7. Promote Regional Best Practices – Expand schemes like Karnataka's Shakti Yojana and Rajasthan's Urban Employment Guarantee.

## Conclusion

India is in its decisive decade of demographic advantage, with the window closing by 2045. The choice is stark: either equip youth with future-ready skills and transform them into an economic powerhouse, or allow the mismatch between degrees and employability to push the nation into a demographic crisis. As Tagore's words remind us, we must prepare our children "for another time" — the AI-driven world of tomorrow.

# Krasheninnikov Volcano

## Context:

Russia's Krasheninnikov Volcano in Kamchatka Peninsula erupted for the first time in over 600 years, days after a major earthquake, raising concerns of earthquake-induced volcanic activity.


## About Krasheninnikov Volcano:

## What It Is?

- Krasheninnikov is a complex stratovolcano system composed of two overlapping cones within a large caldera. It is named after Russian explorer Stepan Krasheninnikov.

## Location:

- Situated on the eastern coast of the Kamchatka Peninsula, Russia.
- Lies within the Kronotsky Nature Reserve, south of Lake Kronotskoye.
- Part of the Pacific Ring of Fire, a seismically active zone.

## Key Features:

- Caldera Formation: Created by a massive eruption approximately 39,000 years ago.

## Twin Cones:

- Southern cone began forming ~11,000 years ago over a period of 4,500 years.
- Northern cone formed afterward, over a similar duration.
- Lava Type: Eruptive products include dacite, a silica-rich volcanic rock.
- Elevation: 1,856 meters above sea level.
- Historical Dormancy: Last eruption estimated around 1463–1550 CE based on tephrochronology.
- Current Status: Issued orange aviation alert due to 6,000 m-high ash plumes.

## About Dacite:

## What is Dacite?

- Dacite is an extrusive igneous (volcanic) rock that forms from the rapid cooling of silica-rich lava on or near the Earth's surface.
- It is compositionally intermediate between andesite and rhyolite, and is commonly found in subduction zone

## Key Features of Dacite:

- Silica Content: High in silica (~63–69% $SiO_2$), contributing to its viscous nature and explosive eruption potential.
- Mineral Composition: Dominated by plagioclase feldspar and quartz, with minor biotite, hornblende, or pyroxene.
- Texture: Usually fine-grained to porphyritic, with larger crystals (phenocrysts) embedded in a fine matrix.
- Formation Environment: Forms in subduction zones where oceanic plates sink beneath continental crust, producing magma through partial melting.

## Geological Significance:

- Indicates viscous lava flows and explosive volcanic behavior.
- Acts as a marker for volcanic arc tectonics and continental crust evolution.
- Presence of dacite is a key signal in volcanic hazard assessment.

## Wastewater Surveillance

### Context:

The Indian Council of Medical Research (ICMR) is set to expand wastewater surveillance for 10 viruses across 50 Indian cities within the next six months.


### About Wastewater Surveillance

#### What it is

- Wastewater Surveillance, also called Wastewater-Based Epidemiology (WBE), is a method of tracking pathogens excreted by humans into sewage systems.
- It provides community-level insights into disease prevalence, even before clinical symptoms appear.

#### Objective

- To establish an early warning system for viral outbreaks.
- To monitor emerging and re-emerging pathogens in a cost-effective and non-invasive way.
- To help policymakers design timely interventions, vaccination drives, and containment strategies.

#### Viruses under Watch

- Currently: COVID-19 virus, Polio virus.
- Planned expansion: Avian Influenza Virus (AIV), and pathogens linked to fever, diarrhoea, acute encephalitis syndrome, and respiratory illnesses.
- In total: 10 viruses will be tracked.

#### Coverage

- Present coverage: 5 cities.
- Planned expansion: 50 cities over six months.
- National scaling up will strengthen India's epidemic preparedness and pandemic prevention capacity.

#### Process of Wastewater Surveillance

1. Shedding of Pathogens – Infected individuals release virus particles through urine, stool, or while washing.
2. Sewage Collection – Samples are taken from sewage before treatment.

3. Laboratory Testing – Samples are tested for viral RNA/DNA fragments.
4. Data Analysis – Trends in infection spread are identified within 5–7 days.
5. Public Health Action – Authorities use results for outbreak warnings, vaccination, and resource allocation.

## NTCA Limits Definition of Tiger Corridors

### Context:

The National Tiger Conservation Authority (NTCA) has restricted the definition of tiger corridors to only 32 "least cost pathways" (2014 report) and those in Tiger Conservation Plans, excluding newer scientific studies.

### About National Tiger Conservation Authority (NTCA)

#### What it is

- A statutory body under the Ministry of Environment, Forest and Climate Change (MoEFCC).
- Apex authority for tiger conservation and management of tiger reserves in India.

#### Established in

- Created in 2005 under the Wildlife (Protection) Act, 1972 through its 2006 amendment.

#### Chaired by

- Headed by the Union Minister of Environment, Forest and Climate Change.
- Vice-Chairperson: Minister of State for Environment.
- Member Secretary: a senior official from MoEFCC (generally Additional DG, Wildlife).

#### Structure of Organisation

1. Chairperson – Union Environment Minister.
2. Members – Experts in ecology, wildlife, tribal welfare, NGOs, and MPs.
3. Member Secretary – senior MoEFCC officer handling administration.
4. Field interface – works closely with State Forest Departments, Tiger Reserves, and the Wildlife Institute of India (WII).

#### Functions & Powers

- Approve Tiger Conservation Plans (TCPs) prepared by states.
- Lay down guidelines for tourism, coexistence, and protection of buffer areas.
- Ensure ecological connectivity by notifying and managing tiger corridors.
- Provide financial assistance for tiger conservation projects.
- Conduct periodic appraisals of tiger status and habitat.
- Use powers under Section 38(O) of Wildlife Protection Act to regulate projects in tiger reserves and corridors.
- Oversee implementation of Project Tiger and maintain national tiger estimation through All-India Tiger Estimation (AITE).

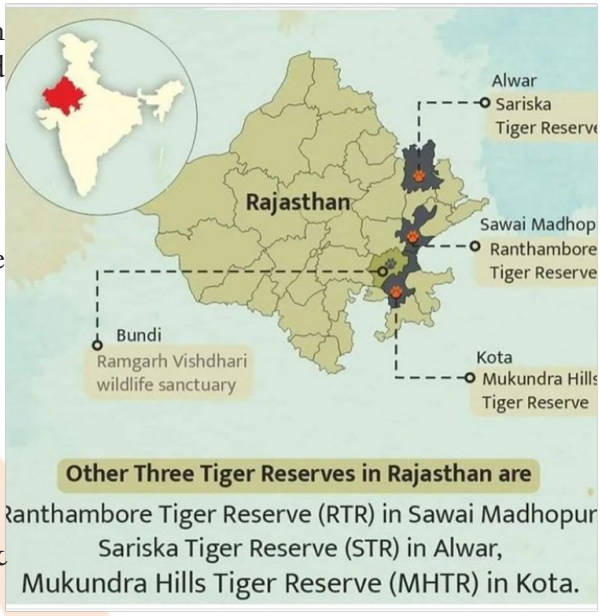
#### Significance of the Current Issue

- Conservation setback: Excluding WII studies and AITE data narrows corridor protection.
- Industrial benefit: Mining and infrastructure projects may now bypass stricter scrutiny.
- Legal implications: The Bombay HC case may decide whether NTCA's volte-face aligns with statutory obligations.
- Ecological risk: Limiting corridors to minimal routes threatens long-term tiger gene flow and survival.
- Policy contradiction: NTCA itself admitted in 2014 that "alternative connectivities do exist and must be conserved".

# Ranthambore National Park

## Context:

Twenty tourists were left stranded during a tiger safari in Ranthambore National Park after their canter broke down and the guide abandoned them.




## About Ranthambore National Park:

### Location:

- Situated in Sawai Madhopur district, Rajasthan, at the junction of the Aravalli and Vindhya ranges.
- Spread over 1,334 sq. km (core area ~275 sq. km).

### History:

- Declared Sawai Madhopur Game Sanctuary in 1955.
- Became a Project Tiger Reserve in 1973.
- Upgraded to National Park in 1980.
- Surrounding forests designated as Sawai Mansingh & Kailadevi Sanctuaries.

### Features:

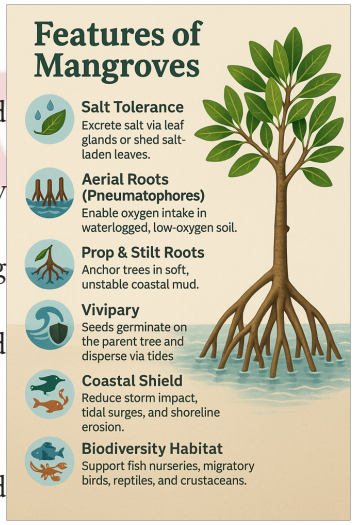
- Terrain: Dry deciduous forests, rocky outcrops, grassy meadows, interspersed with lakes.
- Fort Heritage: 10th-century Ranthambore Fort (UNESCO tentative list), with temples of Ganesh, Shiva, and Jain shrines.
- Water Bodies: Padam Talao (largest lake), Jogi Mahal on its edge.
- Flora: Over 300 plant species, many with medicinal value.
- Fauna: Known for Royal Bengal Tigers often sighted in daylight; also leopards, hyenas, jackals, nilgai, sambar, chital, langurs, sloth bears, and over 270 bird species.

# Restoring Mangroves to Secure India's Coasts

## Context:

India has launched major mangrove restoration drives across Tamil Nadu, Gujarat, and Mumbai to fight climate risks. These efforts enhance coastal security, biodiversity, and climate resilience amid rising ecological threats.

## About Restoring Mangroves to Secure India's Coasts:




### What Are Mangroves?

- Mangroves are salt-tolerant coastal forests that grow in tidal, tropical, and subtropical intertidal zones.
- Distribution in India: India's mangroves cover about 4,900 sq. km, mainly found in Sundarbans, Mahanadi, Godavari, Pichavaram, and Gulf of Kutch.
- Ecological Role: They act as bio-shields during cyclones and floods, reducing wave energy and protecting inland life and property.
- Climate Role: Mangroves store vast amounts of "blue carbon" in their roots and soils, helping mitigate climate change.

### Key Threats to Mangroves:

- Urbanisation: City expansion leads to mangrove clearance for roads, ports, and real estate, destroying natural buffers.
- Pollution & Plastics: Rivers and drains dump waste into mangrove zones, reducing regeneration and harming aquatic life.
- Aquaculture: Shrimp farms in coastal areas have replaced native mangrove habitats, especially in Tamil Nadu and Andhra Pradesh.
- Climate Change: Sea-level rise and erratic rainfall alter tidal patterns and increase salinity, damaging delicate mangrove systems.

- Invasive Species: Invasive weeds like Prosopis juliflora outcompete native flora and degrade mangrove ecosystems.

### Notable Indian Restoration Efforts

- Tamil Nadu – Green Tamil Nadu Mission: Mangrove cover doubled from 4,500 to 9,000 ha (2021–24) via canal reworking and native seed planting.
- MSSRF–Muthupettai Estuary: 115 ha restored with 4.3 lakh Avicennia seeds by collaborating with village committees and forest officers.
- Mumbai – Thane Creek Project: 10.3 crore project to plant 3.75 lakh mangrove saplings and intercept 150 tonnes of plastic over 3 years.
- Women Empowerment through Restoration: Local women are employed in seedling planting and upkeep, linking biodiversity with livelihoods.
- Gujarat – MISHTI Scheme Leader: Over 19,000 ha of mangroves planted in 2 years, exceeding national targets under the MISHTI initiative.

### Strategic Role in Coastal Security

- Disaster Shield: During the 2004 tsunami and recent cyclones, mangroves absorbed wind and wave energy, reducing destruction.
- Livelihood Support: Fisherfolk, crab catchers, and honey gatherers depend on mangroves for income and cultural practices.
- Biodiversity Hotspots: They support species like flamingos, mudskippers, and mangrove herons by providing nesting and breeding grounds.
- Carbon Sink: Mangroves trap $CO_2$ more efficiently than tropical forests, aiding India's Nationally Determined Contributions.
- Eco-Tourism and Coastal Identity: Restored mangroves in Gujarat and Sundarbans have become hubs for nature tourism and heritage education.

### Way Forward:

- Policy Integration: MISHTI should be merged with Smart Cities and CRZ norms to protect mangroves from unregulated construction.
- Community Stewardship: Involve locals in mapping, seed collection, and canal maintenance to ensure ownership and continuity.
- Technological Monitoring: Use drones, satellite imagery, and AI to track mangrove health, growth, and degradation patterns in real time.
- Urban Eco-Planning: Coastal cities must integrate mangrove buffers into urban flood plans, especially in cyclone-prone zones.
- International Partnerships: Collaborate with other tropical nations for joint mangrove research, blue carbon trade, and coastal innovation.

### Conclusion:

Mangroves are nature's frontline defense for coastal India, blending ecology with economy. Their restoration secures biodiversity, climate resilience, and community livelihoods. India must scale scientific, community-led models to protect these green sentinels.

## Asiatic Lion

### Context:

Three Asiatic lion cubs died in Amreli district of Gujarat, with six more under veterinary observation, raising fresh alarms about rising cub mortality amid overall population growth in the Gir landscape.

### About Asiatic Lion:

### What It Is?

- The Asiatic lion is a subspecies of lion found only in India, recognized for its restricted range and distinct physical traits compared to its African cousin.

### Scientific Name: Panthera leo persica

### IUCN Status

- Vulnerable on the IUCN Red List
- Schedule I under Wildlife Protection Act, 1972
- Appendix I of CITES (international trade ban)
- Habitat: Primarily found in the Gir National Park and adjoining areas in Gujarat such as Amreli, Junagadh, Bhavnagar, and coastal zones; over 200 lions now live outside protected areas.

### History:

- Once ranging from eastern India to the Mediterranean, the species was reduced to a handful in Gir by early 1900s.
- Conservation efforts have revived its numbers, but it still exists as a single wild population.

### Features:

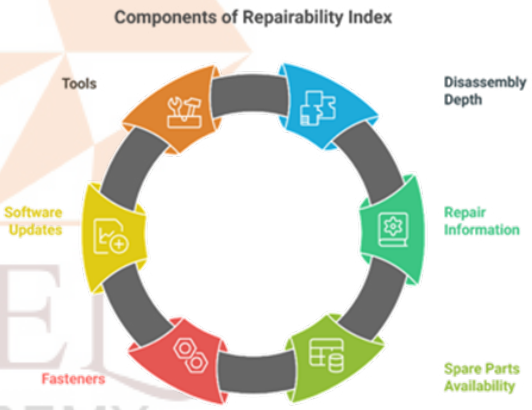
- Males have a sparse mane, with ears visible, unlike African lions
- A distinctive long belly fold is always present
- Coat is sandy to buff-grey, sometimes silvery
- Shoulder height: ~110 cm and length: up to 280 cm
- Weight: Males (160–190 kg), Females (110–120 kg)

## Right to Repair in India

### Context:

India accepted a proposal to introduce a Repairability Index for electronics. This marks a key step towards making the Right to Repair a consumer right.

- However, experts warn that India's informal repair economy—rich in tacit, generational knowledge—is being neglected in digital and AI policy frameworks.




### About Right to Repair in India:

### Understanding the 'Right to Repair':

- Definition: It refers to the legal right of consumers to repair and modify their own products or access affordable third-party services.
- Global Trend: EU mandates access to spare parts and manuals; U.S. states and the UN SDG 12 also push for repair-based sustainability.
- Indian Framework: Department of Consumer Affairs launched a Right to Repair portal (2023), covering electronics, autos, and farm tools.

### Why Repair Must Be More Than a Consumer Right?

- Tacit Knowledge Economy: Informal repairers acquire skills through observation and mentorship, not certifications, making repair an intergenerational knowledge system.

  E.g. Karol Bagh (Delhi), Ritchie Street (Chennai)
- Sustainability through Jugaad: Repair culture reflects India's frugality and resourcefulness by extending product life and reducing e-waste.
- Unorganised, Yet Critical Workforce: Informal repairers are excluded from labour policies, despite being central to India's circular economy.
- Cultural Identity of Repair: Local repair practices carry regional innovation, intuition, and adaptive reuse — a form of indigenous technological heritage.
- Loss of Repair Literacy: Shift towards disposable goods and sealed designs threatens this ecosystem and the social value of reuse.

### Digital Policy Gaps:

- Narrow Scope of E-Waste Rules 2022: Rules emphasize recycling but overlook repair as a first-line defence against e-waste.
- PMKVY's Mismatch: Skill India programs offer rigid modules, which don't suit improvisational, diagnostic repair work.
- NSAI & DPI Oversight: AI and DPI policy frameworks focus on structured data but neglect informal, human-led knowledge inputs.
- NEP 2020 Gaps: While the NEP values experiential learning, it fails to recognize repair work as a form of skill education.
- No Legal Support for Repairers: Informal workers lack formal rights, certification pathways, or recognition in the digital economy roadmap.

### Towards Inclusive and Sustainable Repair Ecosystems:

- AI & DPI Standards: Embed repairability norms in AI systems, hardware standards, and public procurement policies.
- Expanded Right to Repair: Classify products by repairability, ensure access to parts/manuals, and promote community-led repair hubs.
- Skilling Through Recognition: Create recognition and reskilling pathways for informal repairers via e-Shram and custom training modules.
- Knowledge Preservation via AI: Use LLMs and decision trees to translate tacit repair insights into shareable digital formats.
- Policy Convergence: Integrate MoLE, MeitY, and MoRD efforts to create a unified framework valuing repair as both labour and knowledge.

### Significance for India's Development Trajectory:

- Sustainability & SDGs: Supports SDG-12 and Mission LiFE by extending product life, reducing waste, and promoting reuse.
- Labour Empowerment: Recognizes the dignity of informal repairers as skilled contributors to digital and material resilience.
- Digital Justice: Aligns AI growth with inclusion by acknowledging the human inputs behind machine learning and diagnostics.
- Economic Inclusion: Bridges the gap between India's digital vision and grassroots innovation, creating livelihood security.
- Circular Economy Leadership: Positions India as a global example in integrating repair culture into sustainable economic models.

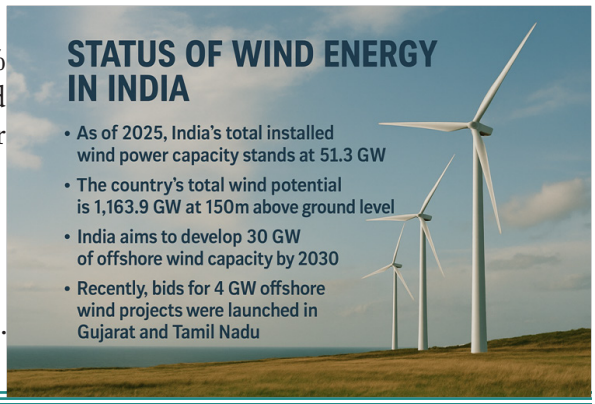
### Conclusion:

As India advances in AI and digital public infrastructure, repair must be seen as both a right and a responsibility. Policies must integrate the silent wisdom of its repair workforce to build a just, inclusive, and sustainable tech future. As Michael Polanyi aptly said, "We know more than we can tell." It's time India remembers what it cannot afford to forget.

## Bird Deaths and Wind Energy in India

### Context:

India added 3.5 GW of wind power in early 2025, marking 82% annual growth, but a Wildlife Institute of India study raised concerns over rising bird deaths near turbines in Rajasthan's Thar Desert, sparking debate on the ecological impact of renewables.




### About Bird Deaths and Wind Energy in India:

### Findings from the WII Study (Thar Desert):

- Conducted over a 3,000 sq. km area in Jaisalmer, Rajasthan.
- Studied 90 wind turbines and found 124 bird carcasses.

- Estimated 4,464 bird deaths per 1,000 sq. km per year.
- In control sites with no turbines, no bird deaths were recorded.
- Critically endangered species like the Great Indian Bustard are at risk.
- The study found raptors to be the most affected bird group.
- Collisions with both wind turbine blades and associated power lines were major causes.

### Why Bird Mortality is a Serious Issue?

1. Migratory Disruption: Thar Desert lies on a key migratory flyway, and turbine installations disrupt bird movement and breeding.
2. Raptor Vulnerability: Raptors' slow reproduction makes them highly sensitive to even minor mortality increases.
3. Biodiversity Hotspot: Wind zones like Jaisalmer host rich birdlife, including endangered species like the Great Indian Bustard.
4. Past Underestimation: Previous studies underestimated risks due to lower bird densities and limited turbine coverage.
5. Ecological Imbalance: Bird loss affects trophic balance, increasing pests and harming agriculture.

### Key Gaps in Policy:

- No Onshore EIAs: Onshore wind farms are exempt from mandatory environmental assessments.
- Weak Wildlife Review: Clearance processes often ignore biodiversity impacts in sensitive areas.
- Shallow Offshore EIAs: Offshore wind projects rely on limited, rapid environmental assessments.
- Cumulative Impact Ignored: Current EIAs neglect regional and long-term ecological consequences.
- Poor Ministry Coordination: Lack of synergy between MNRE and MoEFCC delays ecological safeguards.

### Mitigation Measures and Tools:

- Blade Painting: Painting one blade black enhances visibility and reduces bird collisions.
- Timed Shutdowns: Turbines can be paused during peak migration to prevent strikes.
- Smart Layout Design: Reorienting turbines away from flyways minimizes risks.
- Use of AVISTEP: Mapping tool identifies bird-sensitive zones for better site selection.
- Ground Surveys: Field studies are essential to validate remote avian sensitivity data.

### What Needs to be Done:

- Mandate All EIAs: Require full environmental assessments for both onshore and offshore projects.
- Zoning-Based Siting: Allocate wind sites based on ecological sensitivity and avian flyways.
- Adopt Tech Tools: Use radars and AI systems to monitor bird activity and shut down turbines when needed.
- Include Local Input: Engage ecologists and communities in planning and clearance decisions.
- Fund Long-Term Research: Support multi-year studies to assess biodiversity risks of wind energy.

### Conclusion:

India's shift to renewable energy is essential for climate goals, but it must not compromise biodiversity. Unplanned wind projects can threaten birds, especially in ecologically rich areas like the Thar Desert or coastal flyways. A sustainable approach must integrate ecological science, policy safeguards, and environmental planning to ensure that renewable energy does not come at the cost of wildlife.

## Biochar in India

### Context:

India is set to launch its carbon credit trading market in 2026, and biochar is emerging as a promising $CO_2$ removal technology with applications in agriculture, construction, and energy.

### About Biochar in India:

### What is Biochar?

- Biochar is a carbon-rich byproduct formed by pyrolysis (burning biomass without oxygen) of agricultural residue or organic municipal waste. It is porous, stable, and long-lasting, making it a natural carbon sink when added to soil.

## India's Untapped Biochar Potential

- Agricultural and waste resource base: India produces over 600 million tonnes of agri-residue and 60 million tonnes of municipal solid waste annually.
- Carbon removal: Using 30–50% of this waste, 15–26 million tonnes of biochar can be generated, removing 0.1 gigatonnes of $CO_2$-eq per year.
- Job creation: Decentralised production at village level could create up to 5.2 lakh rural jobs.

  Example: Punjab's stubble burning crisis can be addressed by converting crop residue into biochar, reducing a ir pollution and creating rural livelihoods.

## Multisectoral Benefits of Biochar:

## Byproducts and Energy Potential:

- Syngas (20–30 MT) and bio-oil (24–40 MT) can generate 8–13 TWh electricity annually.
- Can replace 0.4–0.7 million tonnes of coal, reducing fossil fuel dependence.
- Bio-oil can offset 8% of India's diesel/kerosene use, cutting 2% of fossil-fuel emissions.
- Example: Maharashtra pilot projects have used pyrolysis gas for rural micro-grids, reducing diesel generator use.

## Agriculture and Soil Health:

- Improves water retention and reduces fertilizer needs by 10–20%.
- Enhances crop yields by 10–25%, especially in semi-arid, nutrient-depleted soils.
- Reduces $N_2O$ emissions by 30–50%, a gas 273x more potent than $CO_2$.
- Example: Andhra Pradesh Community Managed Natural Farming uses biochar to improve soil organic carbon content.

## Construction Sector Use:

## Adding 2–5% biochar to concrete:

- Boosts mechanical strength
- Increases heat resistance by 20%
- Sequesters ~115 kg $CO_2/m^3$
- Offers green alternative to cement in India's booming infrastructure sector.
- Example: IIT-Madras research shows biochar-concrete mix reduces embodied carbon in buildings.

## Wastewater Treatment:

- 1 kg of biochar can treat 200–500 litres of wastewater.
- India generates 70 billion litres/day, with 72% untreated — huge demand potential for biochar.
- Ideal for decentralised wastewater solutions in urban slums and rural areas.

## Challenges to Large-Scale Adoption of Biochar:

- Absence of Standardised Feedstock Markets: Lack of uniform pricing and quality standards for agricultural residue and biomass feedstock makes large-scale procurement and processing commercially unviable.
- Weak Carbon Accounting and MRV Frameworks: Inadequate monitoring, reporting, and verification systems undermine credibility in international carbon markets, discouraging investor participation.
- Limited R&D and Localisation: Insufficient region-specific research on pyrolysis technologies and biomass optimisation hampers productivity and suitability across agro-climatic zones.
- Fragmented Policy and Institutional Coordination: Biochar remains excluded from mainstream agriculture, waste, energy, and climate policies, creating policy silos that block integrated solutions.
- Lack of Scalable Business Models: Absence of financial incentives, start-up incubation, or private sector participation has prevented the emergence of commercially viable biochar enterprises at scale.

## Way Forward:

## Policy Integration:

## Include biochar in:

- Crop Residue Management programs
- State Action Plans on Climate Change (SAPCCs)
- National Bio-Energy and Waste Management Policies

## Carbon Market Recognition:

- Recognise biochar as an eligible carbon removal pathway under the Indian Carbon Market, enabling credit-

based income for farmers and entrepreneurs.

### Strengthen R&D:

- Develop agro-climatic zone-wise standards.
- Promote indigenous pyrolysis technologies for decentralised, low-cost deployment.

### Awareness and Training:

- Farmer extension services, agri-tech platforms, and local panchayats must be sensitised to biochar benefits and production.

### Conclusion:

Biochar is not a silver bullet, but a scientifically validated, multi-sectoral tool to meet India's dual goals of climate action and inclusive development. With strategic policy integration, market recognition, and community-driven implementation, biochar can become central to India's carbon-neutral growth narrative.

## Great Barrier Reef has recorded its largest Coral Bleach

### Context:

The Great Barrier Reef has recorded its largest annual coral cover decline in nearly 40 years, driven by severe coral bleaching, cyclones, and crown-of-thorns starfish outbreaks.


### About Great Barrier Reef has recorded its largest Coral Bleach:

### What is Coral Bleaching?

- A stress response in corals when symbiotic algae (zooxanthellae) are expelled from coral tissues.
- Loss of algae removes the coral's main food source and colour, leaving it pale or white.
- Bleaching does not always kill coral, but prolonged stress can lead to mortality.

### Causes of Coral Bleaching:

- Increased Sea Temperatures – Often from climate change and El Niño events.
- Pollution & Runoff – Nutrient-rich runoff from agriculture promotes harmful algal blooms and reduces water quality.
- Overexposure to Sunlight – High solar irradiance during heat events.
- Extreme Low Tides – Exposes shallow corals to air and heat stress.
- Cold Stress Events – Rare but possible, such as Florida Keys (2010).

### Process of Coral Bleaching:

- Healthy State – Coral and algae (zooxanthellae) coexist in a symbiotic relationship, with algae providing most of the coral's energy and colour through photosynthesis.
- Stress Trigger – Environmental changes like warmer sea temperatures, pollution, or extreme sunlight disturb this balance, causing physiological stress to the coral.
- Algae Expulsion – In response to stress, coral ejects the algae from its tissues, losing its primary food source and vibrant colour.
- Bleached Stage – The coral's transparent tissue exposes its white skeleton, leaving it weak, energy-deprived, and prone to disease.
- Outcome – If stress is short-lived, algae return and the coral recovers; if prolonged, the coral dies and reef ecosystems degrade.

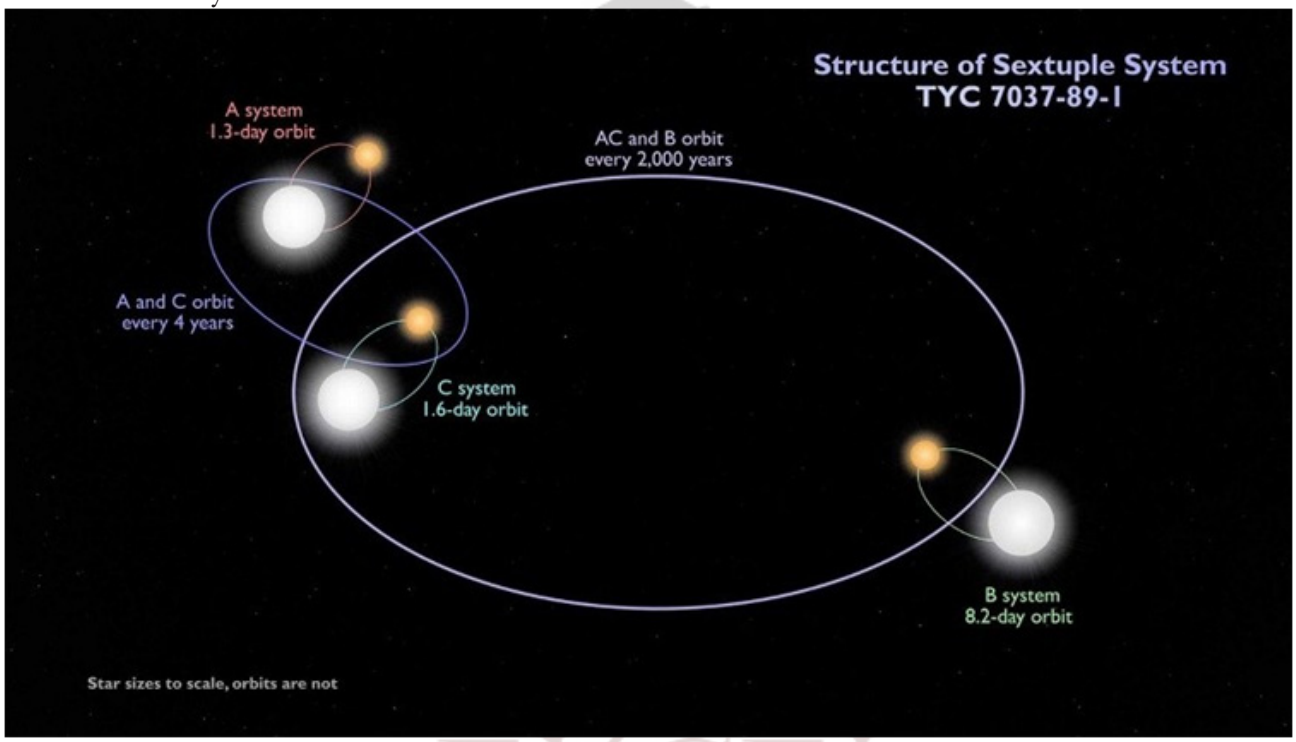
### Implications:

- Ecosystem Collapse – Coral reefs host ~25% of marine species.
- Economic Loss – Impacts fishing, coastal protection, and tourism.
- Biodiversity Decline – Loss of breeding grounds for marine life.
- Climate Feedback Loop – Dead reefs store less carbon and lose their role as natural wave barriers.

## UPM J1040–3551 AabBab

### Context:

Scientists have discovered a rare quadruple star system in our Milky Way galaxy called UPM J1040–3551 AabBab. It is the first known system where two brown dwarfs orbit around two red dwarf stars.




### About UPM J1040–3551 AabBab:

### What it is?

### A unique 4-star system:

- 2 Red dwarf stars (small, common stars that shine faintly but live very long).
- 2 Brown dwarfs (objects between stars and planets, called "failed stars" because they cannot fuse hydrogen like stars).

### Key Features:

- Red dwarfs are bright enough to be studied  scientists can estimate the properties of the faint brown dwarfs.
- Brown dwarfs are about the size of Jupiter, but much heavier.
- Such systems are extremely rare  chances of low-mass brown dwarfs having companions is less than 5%.

### Significance:

- First of its kind  never before seen configuration.
- Helps study brown dwarfs, which are very hard to detect because they are cold and faint.
- Provides insight into how stars and planets form in space.
- Improves knowledge about the distribution of mass in the universe (important in studying dark matter).
- Acts as a natural laboratory  since all 4 formed together, scientists can compare their age, temperature, and composition accurately.

# MiG-21

## Context:

The Indian Air Force (IAF) will retire the iconic MiG-21 fighter jet from operational service on 26 September 2025, after more than six decades of service.

## About MiG-21:

### What it is?

- The MiG-21 is a supersonic jet fighter aircraft that became the backbone of the Indian Air Force for over 60 years.
- Known for its speed, agility, and delta-wing design, it is also the world's most produced supersonic jet fighter.

### Developed by:

- Designed by the Mikoyan-Gurevich Design Bureau (Soviet Union).
- First prototype flew in 1955, formally inducted into the IAF in 1963.

### History in India:

- First squadron: No. 28 Squadron, Chandigarh, earned the title "The First Supersonics".

### Played decisive roles in major wars:

- 1965 war – frontline interceptor.
- 1971 war – executed Dhaka strikes, turning point in victory.
- Kargil War (1999) – limited ground attack/air defence.
- 2019 Balakot aftermath – MiG-21 Bison shot down a Pakistani F-16 (Gp. Capt. Abhinandan Varthaman).
- Nearly 900 MiG-21s served in India, with around 660 built in India under license.

### Key Features:

- Delta wing design and shock cone nose intake for supersonic performance.
- Maximum speed: over Mach 2 (2,175 km/h).
- Operated as interceptor, ground attack, reconnaissance, and training aircraft.
- The MiG-21 Bison variant (2000s) upgraded with: Israeli jammers, Russian R-77 and R-73 missiles, partial glass cockpit, and helmet-mounted sight.
- Despite being called the "Flying Coffin" due to crash record, it remained a symbol of courage, Indo-Russian defence ties, and India's aerospace self-reliance.

# Sci-Hub Ban and the 'One Nation, One Subscription' Scheme

## Context:

The Delhi High Court banned Sci-Hub and its mirror sites following a copyright case by global publishers.

- This has revived the debate on access to research papers and the role of the government's One Nation, One Subscription (ONOS)

## About Sci-Hub

### What it is?

- Founded in 2011 by Alexandra Elbakyan, Sci-Hub is a free online repository of millions of research papers.
- It bypasses paywalls, offering access to academic journals without subscriptions.
- Hugely popular among students, researchers, and independent scholars in developing countries.

### The Sci-Hub Case

- Legal challenge: Elsevier, Wiley, and ACS sued Sci-Hub for copyright infringement. The Delhi HC held Elbakyan in contempt for breaching earlier undertakings.

- Outcome: Internet Service Providers were directed to block Sci-Hub and related portals.
- Significance: While the verdict upheld intellectual property rights, it left unresolved the larger question of how ordinary researchers can afford access in India.

### One Nation, One Subscription (ONOS) Scheme

- Launched in 2024, with an outlay of 6,000 crore for the first phase (2023–26).
- Negotiates bulk deals with 30 publishers to give access to 13,000 journals.
- Phase I: Covers public institutions and universities.
- Phase II: To include private institutes and colleges.
- Objective: Ensure universal and legal access to research material across India, reducing reliance on piracy.

## National Designated Authority for Carbon Markets

### Context:

The Centre has finalised a 21-member National Designated Authority (NDA) to enable India's carbon market.

- This is a mandatory step under Article 6 of the Paris Agreement (2015).


### About National Designated Authority for Carbon Markets

### What it is

- A statutory requirement under Article 6, created by the Environment Ministry.
- Serves as the nodal body to regulate, approve, and monitor carbon market activities in India.

### Composition

- 21-member committee, chaired by the Environment Secretary.
- Includes representatives from External Affairs, Steel, Renewable Energy, Power, and NITI Aayog.
- Multi-sectoral structure ensures alignment with both domestic priorities and international obligations.

### Functions of the NDA

1. Project Approval: Evaluate and authorise projects generating emission reduction units (ERUs).
2. National Criteria: Recommend activities eligible for trading, aligned with India's sustainability goals.
3. Monitoring: Update and revise eligible activities in line with national priorities and climate commitments.
4. Carbon Credit Use: Authorise the use of ERUs for meeting India's NDC targets.
5. International Role: Represent India in Article 6 frameworks, facilitating credit transfers with other nations.

### Significance of NDA for India

- Supports NDCs: Helps India meet its pledge to reduce emission intensity by 45% by 2030 (from 2005 levels).
- Boosts Clean Energy: Encourages investment in renewable and low-carbon projects.

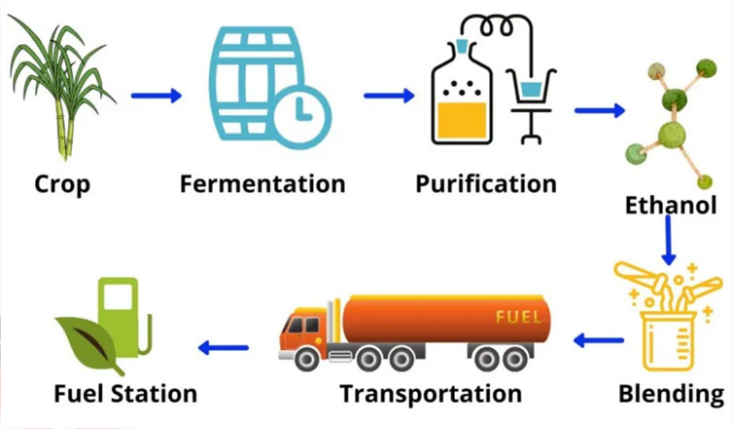
### Article 6 of the Paris Agreement

- What it is: Article 6 sets rules for international carbon markets allowing countries to trade emission reduction credits.
- Established in: Finalised at COP29 in Baku (2024) after years of negotiation.
- Purpose: Helps nations meet their Nationally Determined Contributions (NDCs) by reducing emissions cost-effectively through market-based mechanisms.
- It creates frameworks for bilateral trading, credit authorisation, and sustainable development goals.

# Ethanol Blended Petrol (EBP) programme.

## Context:

India has announced plans for 27% ethanol blending in petrol (E27) by 2030, extending its successful Ethanol Blended Petrol (EBP) programme.




## About Ethanol Blending

- What it is: Ethanol, an alcohol derived mainly from sugarcane, maize, and surplus foodgrains, is blended with petrol to create a cleaner, renewable transport fuel.
- Started in: The Ethanol Blended Petrol (EBP) Programme was launched in 2003, beginning with 5% blending.

## Objectives:

1. Reduce India's dependence on imported crude oil.
2. Conserve foreign exchange reserves.
3. Lower vehicular emissions to support environmental commitments.
4. Provide farmers with assured markets for crops, stabilising incomes.
5. Encourage second-generation ethanol from crop residues, reducing stubble burning.

## Benefits of Ethanol Blending

1. Energy Security – India imports nearly 88% of its crude oil, making the economy highly vulnerable to global price shocks. Ethanol blending substitutes imported crude, thereby reducing dependence on foreign oil.
2. Environmental Gains – Ethanol blends cut carbon monoxide and hydrocarbon emissions, contributing to India's Net Zero 2070 pledge and reducing urban air pollution.
3. Farmer Welfare – Farmers benefit from steady demand for sugarcane and maize; over 1.2 lakh crore has flowed to them in the past decade through ethanol procurement.
4. Rural Development – Distilleries in rural areas create jobs, promote agro-based industries, and reduce distress migration.
5. Circular Economy Link – Initiatives like PM-JI-VAN Yojana promote second-generation ethanol from crop residues, turning waste into energy while tackling stubble burning.

## Concerns and Challenges

1. Food Security Risks – Rising ethanol demand has already strained maize availability, leading to imports and higher prices, potentially affecting poultry and starch industries.
2. Water Stress – Sugarcane, the dominant ethanol feedstock, consumes 1,500–2,000 litres of water per kg of sugar, threatening groundwater in states like UP and Maharashtra.
3. Vehicle Compatibility – Higher ethanol blends reduce fuel efficiency by 6–7% unless engines are specially designed. Flex Fuel Vehicles remain costly and consumer adoption uncertain.
4. Supply Gaps – India produced ~700 crore litres of ethanol in 2023, but E27 will require >1,200 crore litres by 2030; much of the capacity is linked to stressed sugar mills.
5. Financial & Infrastructure Bottlenecks – Banks are hesitant to fund distilleries, and retail infrastructure (storage tanks, pumps, blending facilities) is still inadequate for a nationwide rollout.

## Way Forward

1. Diversify Feedstocks: Promote second-generation ethanol from residues, forestry waste, and municipal solid waste to reduce reliance on food crops.
2. Encourage Smart Farmer Practices: Boost maize productivity through improved seeds and cultivation methods, and restrict sugarcane expansion in water-scarce zones.

3. Consumer Incentives: Subsidise Flex Fuel Vehicles, support retrofitting, and run awareness campaigns to ease transition for consumers.
4. Strengthen Infrastructure: Invest in ethanol storage, blending, transport, and dispensing networks to avoid supply chain bottlenecks.
5. Balanced Energy Transition: Treat ethanol as a bridge fuel—complementary to EVs and green hydrogen, not a substitute.

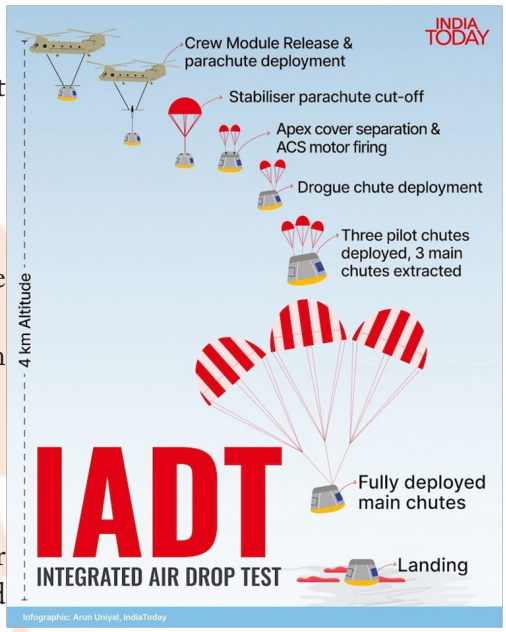
### Conclusion

India's ethanol blending strategy represents a bold leap toward energy independence, cleaner fuels, and farmer empowerment. A diversified, sustainable, and integrated approach can ensure that India's ethanol revolution remains a story of innovation and resilience, rather than a cautionary tale of overreach.

## ISRO Integrated Air Drop Test (IADT-01)

### Context:

ISRO has successfully conducted its first Integrated Air Drop Test (IADT-01) for the Gaganyaan mission.




### About ISRO Integrated Air Drop Test (IADT-01):

### What it is?

- A specialised air-drop experiment to test the end-to-end parachute recovery system of the Gaganyaan crew module.
- Conducted with a dummy crew capsule (≈ 5 tonnes) released from an Indian Air Force Chinook helicopter.

### Developed by: Indian Space Research Organisation (ISRO)

### Aim:

- To demonstrate the reliability and sequencing of parachutes for slowing and stabilising the crew module during re-entry and splashdown.
- Ensure astronaut safety in descent and landing phases, the riskiest part of human spaceflight.

### How the IADT System Works?

### Air Drop Release:

- A dummy crew module (~5 tonnes) is lifted by an IAF Chinook helicopter to a designated altitude.
- The capsule is then air-dropped into free fall.

### Initial Deceleration – Drogue Parachutes:

- Two drogue parachutes (conical, funnel-shaped) open first.
- They stabilise the tumbling capsule and begin slowing it down.

### Trigger Mechanism – Pilot Chutes:

- Smaller pilot parachutes are deployed.
- Their role is to pull out and activate the larger main parachutes.

### Final Deceleration – Main Parachutes:

- Three large main parachutes deploy sequentially.
- They reduce the descent speed to a safe level for splashdown.
- Built with redundancy: even if one fails, the rest can ensure safe descent.

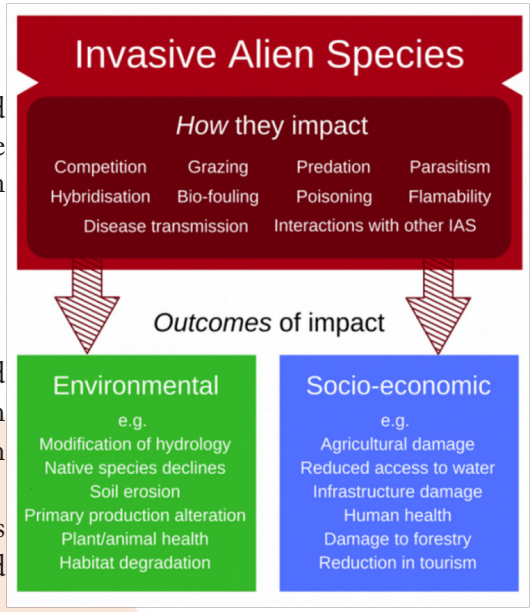
### Splashdown & Recovery:

- The slowed capsule splashes down in water at a survivable speed.
- Indian Navy & Coast Guard teams conduct recovery operations.

### Significance:

- Critical milestone in human-rating India's space systems.
- Boosts confidence ahead of upcoming missions: Test Vehicle-D2 (TV-D2) and first uncrewed Gaganyaan mission (G1).
- Enhances India's progress towards Gaganyaan crewed mission (target ~2027).

## Invasive Alien Species




### Context:

A new study published in Nature Ecology & Evolution has revealed that India is massively underestimating the economic cost of invasive alien species, with management costs underreported by over 1.16 billion percent — the highest global discrepancy.

### About Invasive Alien Species (IAS)

### What it is?

- As per the Convention on Biological Diversity (CBD) and Indian law, an invasive alien species is a non-native organism whose introduction and spread threaten biodiversity, ecosystem services, or human well-being.
- The Indian National Biodiversity Authority (NBA) defines them as species outside their natural range that establish and proliferate, causing ecological or economic harm.

### Characteristics of IAS

1. High adaptability – thrive in disturbed or new ecosystems.
2. Aggressive growth – outcompete native species for light, water, and nutrients.
3. Reproductive advantage – rapid breeding or vegetative propagation.
4. Absence of predators – flourish unchecked in new habitats.
5. Economic and ecological impact – alter soil chemistry, hydrology, and crop yields.

### Global Impact

- Global cost of invasive species since 1960 exceeds $2.2 trillion.
- Non-native plants account for the highest management cost ($926 billion).
- Arthropods ($830 billion) and mammals ($263 billion) follow.
- Europe reported the highest cost ($1.5 trillion).

### India's Case

- Lantana camara, Parthenium hysterophorus, Prosopis juliflora, and Water Hyacinth dominate forests, rangelands, and wetlands.
- Large swathes of Bandipur, Mudumalai, and other reserves are overrun by lantana.
- Agriculture suffers due to weeds like parthenium reducing crop yields.
- Aquatic invasives clog waterways, impacting irrigation and fisheries.

### Threats Posed

1. Biodiversity loss – displacement of native flora and fauna.
2. Agricultural losses – reduced productivity and higher input costs.
3. Health hazards – allergenic weeds cause respiratory and skin diseases.
4. Forest fire risks – highly combustible species like lantana increase wildfire incidents.
5. Economic drain – hidden management costs undermine development goals.

### Initiatives for Management

- National Biodiversity Action Plan (NBAP) emphasises IAS management.

- Convention on Biological Diversity (CBD), 1992 – India is a party and obligated to control IAS.
- National Biodiversity Authority (NBA) – coordinates IAS prevention and awareness.
- Ballast Water Management Convention – to prevent marine invasions.
- State-level eradication drives – manual removal, biocontrol measures, controlled grazing, and afforestation.

## Lunar Module Launch Vehicle (LMLV)

### Context:

The Indian Space Research Organisation (ISRO) has announced the development of its heaviest rocket ever — the Lunar Module Launch Vehicle (LMLV), expected to be ready by 2035.

### About Lunar Module Launch Vehicle (LMLV)

### What it is

- The LMLV is ISRO's next-generation heavy-lift launch vehicle.
- It will be the most powerful rocket built by India, designed specifically for lunar and interplanetary missions.

### Objective

- To enable crewed lunar missions by 2040.
- To carry larger payloads to the Moon and support deep space exploration.
- To enhance India's self-reliance in human spaceflight technology.

### Specifications

- Payload to Moon: ~27 tonnes.
- Payload to Low Earth Orbit (LEO): ~80 tonnes (200–2,000 km).
- Timeline: Planned readiness by 2035.
- Propulsion: Advanced cryogenic and semi-cryogenic engines expected.

### Evolution of ISRO's Launch Vehicles

### 1. Sounding Rockets (1963)

- First Nike Apache sounding rocket launched from Thumba, Kerala.
- Used for atmospheric experiments, not capable of orbital flight.

### 2. Satellite Launch Vehicle (SLV-3) – 1980

- India's first indigenous rocket.
- Led by A.P.J. Abdul Kalam, placed Rohini satellite in orbit.

### 3. Augmented Satellite Launch Vehicle (ASLV) – 1987-94

- Improved SLV with strap-on boosters.
- Limited success, carried payloads up to 150 kg.

### 4. Polar Satellite Launch Vehicle (PSLV) – 1994 onwards

- India's workhorse rocket, highly reliable.
- Payload: ~1,000–1,750 kg to LEO.
- Key missions: Chandrayaan-1 (2008), Mangalyaan (2013).

### 5. Geosynchronous Satellite Launch Vehicle (GSLV)

- Introduced cryogenic engines after US denied transfer in 1990s.
- Payload to GTO: ~2,000–2,500 kg.

### 6. Launch Vehicle Mark-3 (LVM-3 / GSLV Mk-III) – 2017

- India's heaviest operational rocket today.
- Payload: ~4,000 kg to GTO.
- Major missions: Chandrayaan-2 (2019), Chandrayaan-3 (2023).

### 7. Lunar Module Launch Vehicle (LMLV) – 2035 (planned)

- Will surpass all previous rockets.
- Designed for human spaceflight to the Moon and beyond.

## Indian astronaut to land on moon in 2040

### Context:

Union Minister Jitendra Singh announced in the Lok Sabha that an Indian astronaut will land on the Moon by 2040, while also outlining India's broader space roadmap.

### About India's Moon Mission

### What it is?

- India's proposed crewed lunar mission by 2040 is part of a long-term vision to position India as a global space power and align the space programme with the goal of Viksit Bharat by 2047.

### Objective

- To demonstrate human space exploration capability beyond Earth orbit.
- To build indigenous capacity for lunar habitation, exploration, and resource utilisation.
- To integrate India's space programme with its economic, scientific, and security ambitions.

### Key Features

- Human landing: An Indian astronaut will step on the Moon by 2040.
- Indigenous development: Reliance on Indian-built launch vehicles, life support systems, and surface technologies.
- Global collaboration: Scope for joint missions with advanced space agencies for technology sharing.
- Economic vision: The mission will strengthen India's share in the projected $45 billion space economy.

### Other Planned Milestones in India's Space Programme

1. 2026 – Vyommitra Mission: Launch of an uncrewed mission with humanoid robot Vyommitra to test systems.
2. 2027 – Gaganyaan Mission: India's first human spaceflight with astronauts in low Earth orbit.
3. 2035 – Bharat Antariksh Station: Establishment of India's own space station for long-duration experiments.
4. 2040 – Crewed Moon Landing: An Indian astronaut to step on the lunar surface, marking a historic leap.

# Satellite Internet

## Context:

Starlink, Elon Musk's satellite internet service, is set to enter India, marking a major shift in digital connectivity and strategic communication capabilities.

## About Satellite Internet:

### What is Satellite Internet?

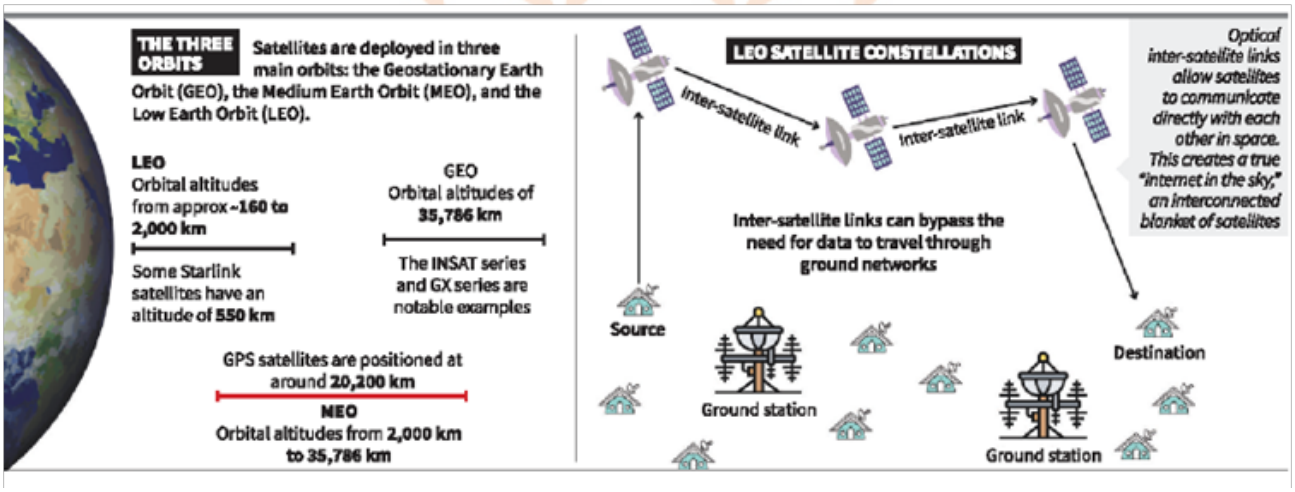
- Satellite internet is a wireless communication technology that delivers internet access via satellites in space, instead of traditional cables or fiber-optic lines. It consists of satellites in orbit, ground stations, and user terminals.

### Need for Satellite Internet:

- Bridging Digital Divide – Delivers internet to remote, rural, and island communities where building terrestrial networks is costly and slow.
- Disaster Resilience – Restores communication quickly after floods, earthquakes, or cyclones disrupt ground-based infrastructure.
- On-the-Move Connectivity – Provides stable internet to moving ships, aircraft, and defence convoys in any terrain.
- Strategic Security – Maintains secure links in high-altitude conflict zones like Siachen, enhancing military readiness.
- Economic Inclusion – Boosts e-governance, e-commerce, and telemedicine for underserved populations.

### Key Features:

- Global Coverage – Operates seamlessly across oceans, deserts, mountains, and polar regions.
- Dual-Use Technology – Serves both civilian needs and sensitive military operations.
- Rapid Deployment – Can be activated within hours to meet urgent connectivity demands.
- Resilience – Functions independently of local cables and towers, avoiding physical damage risks.
- Mega-Constellations – Uses thousands of satellites to lower latency and ensure network redundancy.




### How it works?

- Space Segment: Satellites equipped with communication payloads orbit the Earth, capturing signals from the ground and transmitting them to other satellites or down-to-Earth stations. The payload includes antennas, transponders, and onboard processors that handle data routing.
- Ground Segment: This includes user terminals, antennas, and ground stations that link devices to the satellites. User terminals can be fixed or portable, enabling households, vehicles, or ships to connect without traditional telecom towers.
- Data Flow: When a user sends a request (like loading a webpage), the signal travels from the terminal to the satellite, which relays it to a ground station connected to the internet backbone. The return signal follows the same path in reverse, ensuring global data exchange.
- Seamless Handover: Low Earth Orbit (LEO) satellites move quickly, staying over a user's location for only

a few minutes. As one satellite moves out of range, the system automatically hands over the connection to the next satellite in line, ensuring uninterrupted service without user intervention.

### Differences Between Satellite Orbits:

| Orbit Type | Altitude | Advantages | Limitations | Example |
|---|---|---|---|---|
| GEO | ~35,786 km | Large coverage; stable position | High latency; no polar reach | Viasat Global Xpress |
| MEO | 2,000–35,786 km | Balanced coverage & latency | Needs multiple satellites | O3b Network |
| LEO | <2,000 km | Low latency; cheaper satellites | Small footprint; needs mega-constellation | Starlink |

### Applications:

- Civilian – Extends broadband to villages, aids smart farming, and supports environmental monitoring.
- Disaster Management – Coordinates rescue and relief in hurricane, flood, and earthquake zones.
- Defence – Enables secure battlefield communication, drone operations, and intelligence sharing.
- Transport – Improves safety and navigation in aviation, shipping, and autonomous vehicles.
- Healthcare – Facilitates telemedicine and real-time health monitoring in remote areas.
- Space Economy – Strengthens global trade, tourism, and exploration capabilities.

### Conclusion:

Satellite internet is not just a technological upgrade—it's a strategic enabler for national security, economic growth, and digital equity. India must integrate it into national resilience plans while strengthening indigenous capabilities to ensure autonomy in this emerging domain.

## 18th International Olympiad on Astronomy and Astrophysics

### Context:

India is hosting the 18th International Olympiad on Astronomy and Astrophysics (IOAA) in 2025, welcoming over 300 young astronomers from 64 countries.


### About 18th International Olympiad on Astronomy and Astrophysics:

### What it is?

- The IOAA is a premier global competition for high-school students in the fields of astronomy, astrophysics, and observational sciences.
- It tests theoretical knowledge, data analysis skills, and practical observational abilities.
- Host Country: Mumbai, Maharashtra.
- Organised by: Homi Bhabha Centre for Science Education (HBCSE) and Tata Institute of Fundamental Research (TIFR), in collaboration with the Union Ministry of Education.

### Objectives:

- Promote scientific thinking and problem-solving skills in astronomy and astrophysics.
- Foster international cooperation and cultural exchange among young scientists.
- Inspire careers in space sciences and research.
- Showcase India's advancements in space missions, observatories, and STEM initiatives.

### Features of the 18th IOAA:

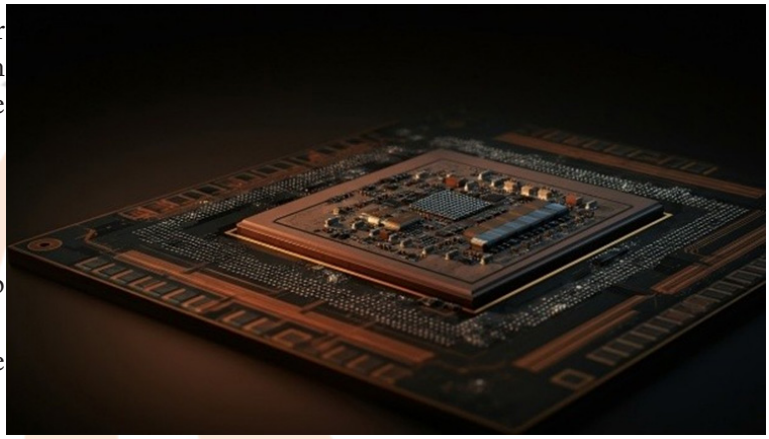
- Largest Edition Yet – Over 300 students from 64 nations.

- Blend of Theory & Practice – Written exams, data analysis, and night-sky observations.
- Highlighting India's Legacy – From Aryabhatta's theories to modern missions like Chandrayaan-3 and Aditya-L1.
- STEM Empowerment – Showcasing initiatives like Atal Tinkering Labs and One Nation One Subscription.
- Global Science Partnerships – Collaboration in mega-projects like the Square Kilometre Array and LIGO-India.

## India Semiconductor Mission (ISM)

### Context:

The Union Cabinet has approved ₹4,600 crore for four new semiconductor manufacturing projects in Odisha, Punjab, and Andhra Pradesh, under the India Semiconductor Mission (ISM).



### About New Semiconductor Plants:

1. SiCSem Pvt. Ltd. (Odisha):
   - In collaboration with Clas-SiC Wafer Fab Ltd., UK.
   - India's first commercial Silicon Carbide (SiC) compound semiconductor fab.
2. 3D Glass Solutions Inc. (Odisha):
   - Vertically integrated advanced packaging & embedded glass substrate unit.
   - Technology: 3D Heterogeneous Integration modules.
3. ASIP Technologies (Andhra Pradesh): Joint venture with APACT Co. Ltd., South Korea.
4. Continental Device India Pvt. Ltd. (Punjab): Brownfield expansion in Mohali.

### About India Semiconductor Mission (ISM):

### What it is?

- A government initiative to develop a robust semiconductor and display manufacturing ecosystem in India.

### Launched in: 2021

- Nodal Ministry: Ministry of Electronics and Information Technology (MeitY)

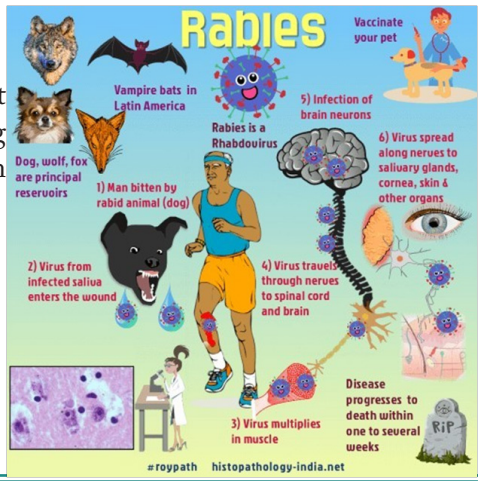
### Key Features:

- Vision: Make India a global hub for semiconductor design, manufacturing, and innovation.
- Investment Incentives: Financial support for fabs, compound semiconductors, ATMP/OSAT units, and display fabs.
- Design Ecosystem Support: Assistance to startups, MSMEs, and academia in chip design.
- Talent Development: Training over 60,000 skilled professionals.
- Strategic Importance: Reduces import dependency, supports self-reliance under Atmanirbhar Bharat.

## Rabies

### Context:

The Supreme Court has ordered the immediate capture and permanent confinement of stray dogs in Delhi amid rising rabies-related deaths, bringing renewed focus to this preventable yet fatal disease that kills thousands in India each year.




### About Rabies:

### What it is?

- A fatal zoonotic viral disease caused by the Rabies virus (RABV).
- Classified by WHO as a Neglected Tropical Disease (NTD).

### Vector & Transmission:

- Primary vector: Dogs (responsible for ~99% of human cases).
- Other carriers: Cats, bats, raccoons, foxes, skunks, livestock.
- Spread through bites, scratches, or saliva contact with broken skin/mucous membranes.

### Infection & Spread:

- Incubation stage – Virus remains dormant for days to months (commonly 1–3 months).
- Nervous system invasion – Virus travels via peripheral nerves to the brain.
- Fatal outcome – Once symptoms appear, death is almost certain without intervention.

### Symptoms:

- Early: Fever, headache, malaise, pain/tingling at wound site.

### Advanced:

- Furious rabies: Hyperactivity, hallucinations, hydrophobia, aerophobia, excessive salivation.
- Paralytic rabies: Gradual muscle paralysis, coma, eventual death.

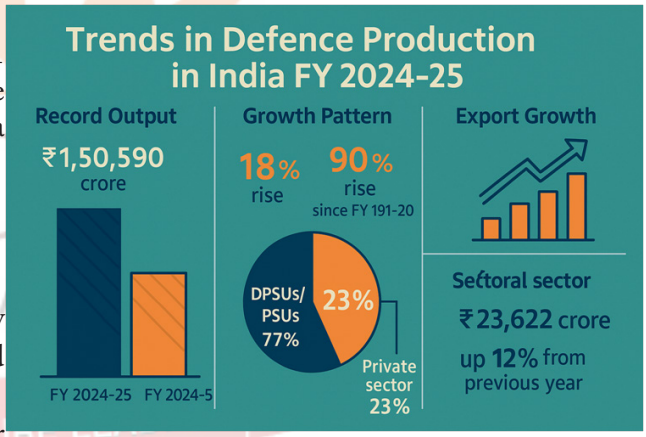
### Distinctive Features:

- 100% preventable with timely vaccination.
- Once symptoms appear, mortality is nearly 100%.
- Children (5–14 years) are most vulnerable in endemic regions.
- Treatment: Rabies prevention involves PEP (4-dose vaccine + RIG for unvaccinated) after exposure and PrEP for high-risk groups.
- WHO-approved vaccines include RABIVAX-S, VaxiRab N, and VERORAB, with immediate wound washing being essential before vaccination.

## Defence Production in India FY 2024-25

### Context:

India's annual defence production touched a record 1.51 lakh crore in FY 2024-25, marking an 18% growth over the previous year and a 90% jump since FY 2019-20, reflecting a stronger domestic defence industrial base.




### About Defence Production in India FY 2024-25:

### What It Is?

- The process of manufacturing weapons, military systems, and defence equipment for India's armed forces and export markets.
- Includes production by Defence Public Sector Undertakings (DPSUs), Ordnance factories, other PSUs, and private sector companies.

### Trends:

- Record Output – 1,50,590 crore in FY 2024-25.
- Growth Pattern – 18% rise from FY 2023-24; 90% rise since FY 2019-20.
- Sectoral Share – DPSUs/PSUs: 77%; Private sector: 23% (up from 21% last year).
- Policy Drivers – Indigenisation push under Aatmanirbhar Bharat, ease of doing business reforms, higher private participation.
- Export Growth – Defence exports at 23,622 crore in FY 2024-25, up 12% from previous year.

## ICAR's AI-Powered Agromet Advisory

### Context:

ICRISAT and ICAR have launched an AI-powered, context-specific Agromet Advisory Service for climate-resilient agriculture.


## About ICAR's AI-Powered Agromet Advisory:

### What it is?

- It is a real-time, personalised climate advisory system developed using Artificial Intelligence (AI) and Machine Learning (ML) to assist smallholder farmers in making informed agricultural decisions amid rising climate risks.
- Developed by: Jointly launched by ICRISAT and ICAR, with support from the Government of India's Monsoon Mission-III and partners like IMD, IITM, and CGIAR's AI4CRA.
- Objective: To provide real-time, hyper-local, and personalised weather and climate advisories to smallholder farmers for adaptive decision-making.
- Pilot Implementation: The project is being piloted in Maharashtra through ICAR's Agro-Meteorological Field Units (AMFUs) before scaling nationwide and internationally.

### Key Features:

- AI & ML-based dynamic models for crop-weather analytics.
- AI-powered WhatsApp bot for easy delivery in regional languages.
- Personalised insights based on crop cycle, soil, location, and socio-economic profile.
- Real-time integration of IMD data and satellite observations.
- Multi-channel dissemination including IVRS, mobile apps, and village resource centres.

### Significance:

- Enhances climate resilience of over 120 million small and marginal farmers.
- Boosts productivity by reducing climate-related uncertainties.
- Bridges last-mile delivery gap in agri-tech advisory.

## Human Outer Planetary Exploration (HOPE)

### Context:

Bengaluru-based space company Protoplanet has launched the Human Outer Planetary Exploration (HOPE) station in Ladakh's Tso Kar region to simulate lunar and Martian conditions.

## About Human Outer Planetary Exploration (HOPE):

### What It Is?

- HOPE is a moon and Mars simulation research station located in Ladakh's high-altitude Tso Kar basin, mimicking off-Earth terrain and environmental conditions.
- Developed By: The project is spearheaded by Protoplanet, a Bengaluru-based space outreach organisation, with technical and financial assistance from ISRO.

### Aim of the Project:

- To examine psychological, physiological, and epigenetic responses of humans in extreme isolation.
- To support India's long-term goals of a crewed lunar mission (by 2040) and a space station (by 2035).

### Key Features:

- Located at high-altitude, cold-desert terrain resembling lunar and Martian environments.
- Two scientists will live in isolation for 10 days to test deep space stress resilience.
- Research includes studies on mental health, biological adaptation, and mission planning.
- ISRO guided the selection criteria for crew participants.
- Periodic crew rotation planned to test individual variability in confined conditions.

### Significance:

- Marks a vital step towards India's crewed spaceflight capability and interplanetary mission readiness.
- Enhances India's presence in the global space research ecosystem, alongside facilities in the US, Canada, and Russia.
- Provides actionable data for future Bharatiya Antariksh Station and Gaganyaan-type missions.

## Energy sovereignty is the new oil

### Context:

Energy is no longer a passive growth input but the foundation of sovereignty and security. For India, with 85% crude and 50% natural gas dependence, energy shocks directly hit trade balance, inflation, and national resilience.


### Global Context: Lessons from Energy Flashpoints

1. 1973 Oil Embargo – The Arab embargo quadrupled oil prices, compelling Western economies to create strategic reserves and efficiency mandates to cut OPEC dependence.
2. 2011 Fukushima Disaster – The meltdown eroded nuclear confidence, but its absence led to coal/gas resurgence, showing that abandoning zero-carbon baseload has climate costs.
3. 2021 Texas Freeze – Gas pipelines froze and wind turbines stalled, revealing how over-optimisation for cost weakens resilience in extreme weather events.
4. 2022 Russia–Ukraine War – Europe's 40% gas dependence on Russia turned into a weapon, forcing LNG diversification and short-term coal revival.

### India's Current Energy Vulnerabilities

1. Import Bill Burden – Crude oil and gas imports worth $170 bn in FY24 formed 25% of merchandise imports, straining foreign exchange and widening CAD.
2. Overconcentration on Russia – Post-Ukraine war, Russian share rose to 35–40% of imports, exposing India to geopolitical risk and sanctions vulnerability.
3. Macro Instability – Import spikes depreciate the rupee, fuel inflation, and undermine fiscal space for welfare and infrastructure spending.
4. Geopolitical Flashpoints – West Asian conflicts like Israel–Iran could disrupt 20 mb/d flows, pushing crude above $100 and destabilising India's supply chains.

## Key Challenges to Energy Sovereignty

1. Technology Gaps – India lacks indigenous SMR designs, advanced coal-gasification, and imports 80% of electrolyser parts from China/EU, weakening self-reliance.
2. Financing Deficit – Energy transition requires $10 trillion till 2070 (CII estimate), but India's green finance inflows remain far below this target.
3. Infrastructure Bottlenecks – Weak transmission networks, storage scarcity, and low-voltage stability hinder large-scale renewable integration.
4. Policy Fragmentation – Overlapping mandates of MoP, MNRE, and MoPNG slow decisions, creating incoherence in long-term energy planning.
5. Environmental-Social Costs – Coal gasification raises emissions, nuclear projects face land protests, and large hydro risks ecological displacement.
6. Global Market Volatility – LNG price shocks, carbon border taxes like EU's CBAM, and OPEC supply curbs disrupt India's external balance.
7. Critical Mineral Dependence – Lithium, cobalt, and nickel imports for batteries and hydrogen systems create new strategic dependencies.

## Five Pillars of India's Energy Sovereignty

1. Coal Gasification with Carbon Capture – India's 150 bn tonnes of reserves can produce syngas, methanol, and hydrogen if ash-barriers are overcome via advanced technology.
   Eg: NITI Aayog's pilot coal-to-chemicals projects aim at commercialisation.
2. Biofuels for Rural Empowerment – Ethanol blending and SATAT CBG plants reduce crude imports while bio-manure enriches degraded soils and improves water retention.
   Eg: Ethanol blending transferred 92,000 cr to farmers by 2024.
3. Nuclear Backbone – Reviving thorium roadmap, expanding uranium tie-ups, and adopting SMRs will create stable, zero-carbon baseload for a renewable-heavy grid.
   Eg: Nuclear stuck at 8.8 GW, far below India's 100 GW target.
4. Green Hydrogen Leadership – Target of 5 MMT/year by 2030 requires local electrolyser, catalyst, and storage ecosystems to cut external dependence.
   Eg: National Green Hydrogen Mission launched in 2023 focuses on supply chain localisation.
5. Pumped Hydro Storage – Using India's topography, pumped hydro can provide inertia and backup to balance intermittent solar and wind.
   Eg: New pumped storage projects in Maharashtra and Andhra Pradesh underway.

## Way Forward

1. Diversify Sources – Beyond Russia and West Asia, India must secure crude and LNG ties with Africa, Central Asia, and Latin America.
2. Expand Strategic Reserves – India's 77-days cover must scale to IEA's 90-day benchmark for true buffer security.
3. Balanced Transition – Maintain a fossil-renewable mix till 2040 to avoid disruptions while scaling clean tech.
4. Institutionalise Sovereignty Doctrine – A National Energy Sovereignty Council should integrate energy, climate, and security policy.
5. Technology Partnerships – Use Quad, BRICS+, and I2U2 platforms for SMRs, hydrogen tech, and carbon capture collaborations.

## Conclusion

Energy sovereignty is the survival doctrine of the 21st century. By addressing structural challenges and leveraging its five-pillar roadmap, India can insulate itself from global shocks, secure affordable energy, and emerge as a resilient energy power.

# Should States Be Compensated for Revenue Loss from GST Reforms?

## Context:


The Union government's proposal to shift GST into a two-tier structure of 5% and 18% is aimed at simplification and competitiveness, but it may cause a short-term revenue loss of 60,000–1,00,000 crore. With the five-year compensation scheme (2017–22) having ended, the debate over whether States should be compensated has resurfaced.

## What is it about?

1. The Centre has proposed rationalising GST into two slabs (5% and 18%), retaining a higher ~40% rate for sin and luxury goods.
2. The reform will bring down the average GST rate to ~10%, from 11.5% currently, aligning India with advanced economies and improving competitiveness.
3. The short-term revenue loss is estimated at 60,000–1,00,000 crore annually (~0.2–0.3% of GDP), and about 45,000 crore in FY2025–26 (first partial year of implementation).
4. States will not be equally affected: industrialised States like Maharashtra, Karnataka, and Tamil Nadu may see revenue falls in appliances and electronics, while agrarian States like Bihar or Uttar Pradesh, where essentials dominate consumption, face little impact.
5. The five-year GST compensation scheme (2017–22), leaving no automatic cushion for States during this reform phase.

## Why it matters

1. Unequal fiscal impact: In the 2018 GST rate cuts, Maharashtra and Karnataka saw a 3–4% dip in monthly collections, while north-eastern States barely felt any change — showing asymmetry in outcomes.
2. Federal trust deficit: GST was adopted only after Centre's promise of 14% annual revenue growth compensation for 5 years; breaking these precedent risks weakening confidence in the GST Council.
3. Developmental consequences: Revenue stress could limit States' spending on health, education, and infrastructure — for example, Karnataka's urban tax dependence makes it vulnerable to shortfalls.
4. Competitiveness boost: At ~10%, India's average GST rate matches developed economies, strengthening "Make in India" and attracting global manufacturing investments.
5. Political economy factor: The Prime Minister's Independence Day announcement signals strong political backing; States may debate timing and product classification, but reforms are unlikely to be stalled.

## State Compensation

## Case for Compensation

1. Fairness in transition: States like Tamil Nadu and Maharashtra, with broader tax bases, should not disproportionately bear reform costs while smaller States remain insulated.
2. Fiscal stability protection: In FY2026, expected losses of ~ 45,000 crore could undermine States' fiscal positions without transitional aid.
3. Asymmetric exposure: Manufacturing-heavy States depend on higher-tax slabs (e.g., appliances at 28% moving to 18%), making them more exposed to shortfalls.
4. Global precedent: Developed economies implementing GST often used dual mechanisms — GST-linked compensation and central packages — to smoothen the transition.
5. Reform acceptance: In 2017, compensation was the "political glue" for GST adoption; repeating it now would ensure smoother acceptance of slab rationalisation.

### Case against Compensation

1. Unsustainable burden: Annual shortfall estimates ( 60,000–1,00,000 crore) make perpetual compensation fiscally unviable for the Centre.
2. Moral hazard: Guaranteed revenue may disincentivise States from plugging GST leakages — despite e-invoicing and digital compliance gains reducing losses elsewhere.
3. Transition period over: The five-year compensation window (2017–22) was designed as a one-time cushion; extending it risks setting a precedent of permanent bailouts.
4. Growth dividend offset: Lower rates on essentials/durables will expand consumption and compliance — e.g., higher demand for appliances shifts transactions into the formal tax net.
5. Alternative models exist: Kerala's flood cess (2019) is an example of a State-specific stabilisation tool that reduces reliance on Centre-led compensation.

### What can be done

1. Time-bound support: Provide short-duration relief, especially in FY2026, when the revenue dip is estimated at ~ 45,000 crore.
2. Selective assistance: Focus aid on industrialised States facing sharper shocks, not uniform across all States.
3. Stabilisation fund: A portion of GST could be channelled into a contingency pool under the GST Council, similar to compensation cess but more flexible.
4. Performance-linked aid: Tie assistance to reforms in e-invoicing, compliance monitoring, and tax base expansion to reduce moral hazard.
5. Strengthening GST Council dialogue: Maintain transparency in revenue projections and product reclassification debates to preserve consensus-based decision-making.

### Conclusion

GST rationalisation promises simplicity, competitiveness, and long-term buoyancy, but its uneven short-term shocks could destabilise State finances. While permanent compensation is fiscally unsustainable, transitional, targeted, and reform-linked support can balance fiscal responsibility with cooperative federalism, ensuring that reforms succeed without undermining State stability.

## Converting weeds to wealth

### Context:

Invasive plant species like water hyacinth, parthenium, and mikania are often viewed as ecological threats. They obstruct waterways, harm biodiversity, and disrupt rural livelihoods. Yet, recent scientific and entrepreneurial initiatives show that these "green pests" can be converted into resources for local economies, aligning with sustainability, employment generation, and poverty alleviation.

### Issues with Invasive Weeds

1. Ecological damage – Choke water bodies, obstruct irrigation canals, reduce fish catch, and harm biodiversity (e.g., Kaziranga, Dibru-Saikhowa).
2. Public health hazards – Hyacinth mats encourage mosquito breeding, raising malaria/dengue risks.
3. Economic disruption – Fishermen and farmers face higher costs due to clogged waterways and reduced crop productivity.
4. Governance challenge – Habitats are "commons" with weak accountability, often neglected by local bodies.
5. Symbolic issue – Spread of weeds reflects larger problems of pollution, encroachment, and climate stress.

### Opportunities: Turning Threats into Assets

1. Green products –

- Symbiosis University, Pune: Converting water hyacinths into menstrual hygiene products (Elsevier Climate Challenge award, 2025).
- Assam start-up: Eco-friendly handmade paper from hyacinths.

2. Policy initiatives – Swachh Bharat has supported small-scale weed-to-product innovations.
3. Scientific breakthroughs – IISc Bengaluru study on breaking down DELLA protein could enhance crop productivity, showing synergies between botany & AI.
4. Food chain impact – Kaziranga study found vitamin-D-rich weeds consumed by wild boars, suggesting ecological utility.
5. Employment generation – Labour-intensive weed removal can be linked to MGNREGA, afforestation drives, and Panchayat-led local asset creation.

### Governance & Policy Dimensions

1. Integrating the environment with poverty alleviation – Echoing Anil Agarwal's vision, afforestation and weed management can be part of anti-poverty strategies.
2. Strengthening MGNREGA – Shift from low-impact projects to environmental clean-ups, wetlands restoration, and irrigation channels.
3. Revamping Panchayati Raj – Empowering local bodies to manage commons, wetlands, and village ecosystems.
4. Public–Private Collaboration – Encourage start-ups, research institutions, and farmers' groups to commercialise weed-to-wealth ideas.
5. Demand-supply loop – Create markets for eco-products to ensure scalability and avoid pilot-project failures.

## System of National Accounts 2025

### Context:

The United Nations Statistical Commission has adopted the System of National Accounts 2025 (SNA 2025), a revised global framework for measuring economies. It integrates concerns of inequality, environment, and unpaid work into national accounts, going beyond GDP.


### About System of National Accounts 2025:

### What it is?

- A comprehensive international framework for compiling national accounts, replacing the earlier SNA 2008.
- Moves beyond GDP to capture sustainability, distribution, and non-market activities.

### Key Features:

- Natural Capital Accounting: Depletion of minerals, coal, oil, and gas treated as production cost; renewables like solar, wind, hydro recognised as assets.
- Distributional Accounts: Income, wealth, consumption, and savings shown by household groups to highlight inequality.
- Unpaid Work Inclusion: Household and care work included in extended accounts to recognise women's contribution.
- Broader Policy Relevance: Links national growth with fairness, ecological balance, and inclusiveness.

### India's Preparedness:

- Green National Accounts & EnviStats: India has already started publishing annual EnviStats reports (since 2018), tracking forests, water, minerals, and energy as recommended by the Dasgupta Committee (2013).
- Time Use Surveys (2019, 2024): These surveys provide evidence of unpaid household and care work, crucial for integrating women's invisible labour into national accounts.

- PLFS, AIDIS, Consumption Surveys: Together, these databases capture employment, household earnings, wealth distribution, and consumption patterns that can be aligned with SNA 2025's distributional accounts.
- Base Revision Exercise: The ongoing revision of India's National Accounts offers a timely chance to integrate natural resource depletion, inequality, and unpaid work into the GDP framework.

### Opportunities:

- Sustainable resource use: Accounting for depletion strengthens the case for using mining royalties and resource revenues to build sustainability or future generation funds.
- Renewable energy as wealth: Recognising solar, wind, and hydro as assets redefines clean energy not only as climate action but also as economic capital.
- Gender-sensitive data: Inclusion of unpaid work helps policymakers design labour and social policies that better reflect women's contribution to the economy.
- Targeted welfare: Linking inequality analysis with national accounts allows governments to identify "who benefits from growth" and design sharper welfare schemes.

### Challenges Ahead:

- Data integration: Combining survey micro-data (PLFS, NSS, consumption) with national aggregates is complex but essential for accuracy.
- Institutional capacity: Statistical divisions at the Centre and states need training, tools, and manpower to adopt green and distributional accounting.
- Political resistance: Resource-rich states may object if their reported GSDP falls once natural resource depletion is counted as a cost.
- Communication gap: Despite innovations, India's statistical progress is poorly communicated, leading to outdated criticism in public debates.

### Way Forward:

- Roadmap for base revision: A clear timeline and methodology should be drawn to fully adopt SNA 2025 in India's next GDP base revision.
- Build state capacity: Resource and training support must be given to states for preparing natural capital and distributional accounts.
- Institutionalise new data: Regularly include time-use, unpaid care work, and household inequality statistics into national accounts.
- Communicate innovations: Proactive outreach and publications are needed to highlight India's advances in global statistical practices.

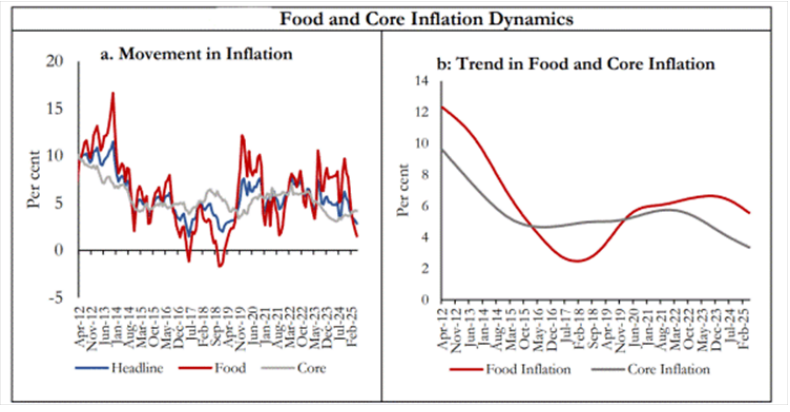
### Conclusion

SNA 2025 marks a shift from GDP-centric measurement to sustainability and inclusiveness. India, with its groundwork in green accounts and social surveys, is well-placed to adapt. As we march toward Viksit Bharat 2047, adopting SNA 2025 ensures that our growth story is not just about economic size but also about equity, environment, and dignity for all.

## Inflation targeting and the test of credibility

### Context

The Reserve Bank of India (RBI) released its discussion paper (August 2025) on reviewing the flexible inflation targeting (FIT) framework. With the current 4% CPI target within a 2–6% tolerance band expiring in March 2026, the RBI has cautioned that raising the target could dilute credibility and reverse policy gains.




### Rationale for Retaining the 4% Target

- Credibility with Global Investors: Raising the target could be read as tolerance for

higher inflation, weakening policy reputation. The recent S&P Global upgrade to BBB highlighted RBI's inflation management as a pillar of investor confidence.

- Institutional Stability: The framework has built confidence in the MPC process and fiscal responsibility norms.
- Domestic Outcomes: Headline CPI inflation has largely stayed within the 2–6% band since 2016, reflecting policy success. The July 2025 figure of 1.55%, the second-lowest since the series began, is evidence of stability.
- External Balance: Low and stable inflation protects the rupee, maintains external competitiveness, and prevents erosion of capital inflows.

## Headline vs. Core Inflation Debate

- Survey Argument (2023–24): Suggested targeting core inflation (excluding food and fuel), since food inflation is mostly supply-driven and outside the RBI's control.
- RBI's Counter: Persistent food price shocks spill into wages, rents, and mark-ups, affecting core inflation in the long run. Hence, headline CPI cannot be ignored.
- Global Norm: Nearly all inflation-targeting countries (advanced and emerging) use headline CPI; Uganda is the only one using core inflation.
- Indian Reality: With food accounting for almost 50% of the CPI basket, excluding it would weaken policy relevance for households and workers.

## Key Issues in the Framework

1. Target Level: Lowering below 4% is unsuitable for India's growth needs; raising above 4% could erode institutional credibility.
2. Tolerance Band: Debate exists on whether to keep the 2–6% band, narrow it, or remove it altogether. A band offers flexibility but can reduce accountability.
3. Volatility in Inflation: Between 2014–2025, CPI inflation ranged between 1.5% and 8.6%, largely due to food price swings, while core inflation remained more stable.
4. Policy Certainty: The framework has provided consistency, helping India withstand shocks like the pandemic and oil price surges without runaway inflation.

## Positive Outcomes of the Framework

1. Anchored Inflation Expectations: Households and firms have adapted decisions around a credible 4% anchor, reducing uncertainty.
2. Improved Sovereign Ratings: Agencies like S&P Global have upgraded India, citing RBI's success in keeping inflation broadly within the 2–6% band.
3. External Stability: Low inflation has strengthened the rupee, stabilised foreign capital inflows, and supported current account management.
4. Investor Confidence: Predictable inflation management reduces risk premiums on Indian assets, encouraging FDI and portfolio inflows.
5. Resilience to Shocks: Despite global supply disruptions, India avoided runaway inflation, showing the framework's effectiveness in turbulent times.

## Way Forward

1. Retain 4% Target: Raising above this could be viewed as dilution of policy; RBI stresses keeping it unchanged to preserve credibility.
2. Do Not Lower Below 4%: A lower target could unnecessarily constrain growth in a developing economy like India.
3. Continue Headline CPI: Food inflation has long-run spill overs into core; targeting only core would ignore household realities.
4. Review Tolerance Band: Debate on whether to maintain, revise, or drop the 2–6% band continues; RBI advises caution against disrupting tested elements.

5. Preserve Policy Certainty: Continuity in the framework is crucial in a time of geopolitical and economic uncertainty, ensuring India's gains in fiscal responsibility and external stability are not eroded.

### Conclusion

The inflation targeting framework has anchored prices and strengthened India's economic credibility since 2016. RBI's paper makes clear that the 4% anchor, headline CPI focus, and tolerance band remain essential. Fine-tuning may be considered, but continuity and credibility must guide the framework's renewal in 2026.

## SEBI Moots 'Regulated Venue' for Pre-Listing Companies

### Context:

The Securities and Exchange Board of India (SEBI) has proposed creating a "regulated venue" for trading shares of pre-listing companies.

### About Regulated Venue for Pre-Listing Companies

### What it is

- A formalised platform under SEBI oversight where unlisted companies' shares can be traded before their Initial Public Offering (IPO).
- Will function as a transparent alternative to the unregulated grey market.

### Objective

- Promote fair price discovery before IPO.
- Ensure government receives taxes and revenue from such transactions.
- Protect investors by bringing informal trades under legal scrutiny.
- Strengthen market integrity and transparency in capital markets.

### About Grey Market

### What it is?

- Definition: An informal market where shares of companies that are about to be listed trade between buyers and sellers based on mutual agreement.
- Operates outside regulatory purview, lacking transparency and investor protection.

### Issues with Grey Market

- Encourages unofficial pricing distorts IPO valuations.
- Exposes investors to risks of fraud and manipulation.
- Leads to tax leakages as trades remain undocumented.

### Significance of SEBI's Move

#### 1. Fair Price Discovery

- A regulated venue will reflect the true demand and supply before IPOs, avoiding artificial overvaluation.

#### 2. Revenue & Tax Compliance

- Formalising the trades ensures government earns its due share of taxes.

#### 3. Investor Protection

- SEBI oversight safeguards investors from misleading practices, manipulation, and fraud.

#### 4. Market Efficiency

- Creates a structured mechanism for price formation in pre-listing shares.

5. Global Alignment

- Many advanced economies have secondary private markets regulated under law, making India's step globally relevant.

## S&P Global Upgrades India's Sovereign Credit Rating to 'BBB'

### Context:


S&P Global has upgraded India's long-term unsolicited sovereign credit rating to 'BBB' from 'BBB-' after 18 years, citing strong economic resilience, fiscal consolidation, and stable policy outlook.

### About S&P Global Upgrades India's Sovereign Credit Rating to 'BBB' After 18 Years:

### Credit Rating Agency – S&P Global:

### What it is?

- S&P Global Ratings is one of the world's leading credit rating agencies, providing independent opinions on credit risk.
- Headquarters: New York City, USA.
- Aim: To offer transparent, credible, and independent assessments of the ability and willingness of borrowers to meet their financial commitments.

### Functions:

- Assigns Public Ratings for issuers of securities and loans.
- Provides Private & Confidential Ratings for internal benchmarking.
- Delivers analytical reports on credit risk for corporates, governments, infrastructure, insurance, and public finance sectors.
- Enhances corporate transparency and investor confidence by making creditworthiness visible in financial markets.

### About India Rating Increase by S&P:

### What it is?

- Upgrade from BBB- to BBB in long-term sovereign rating.
- Short-term rating raised from A-3 to A-2.
- Transfer and convertibility assessment upgraded from BBB+ to A-.
- First sovereign upgrade for India by S&P since January 2007.

### Criteria Used:

- Strong GDP growth and robust macroeconomic fundamentals.
- Sustained fiscal consolidation and improved quality of public spending.
- Stable monetary policy anchoring inflation expectations.

### Significance:

- Enhances India's position within the investment-grade category, improving global investor confidence.
- Likely to attract higher foreign portfolio inflows, particularly into bond markets.
- Expected to reduce borrowing costs for the government and corporates.
- Positions India as a leading emerging market economy with improved market sentiment.
- Opens pathway for future upgrades if fiscal deficit and debt-to-GDP ratios improve further.

## AI and the Restructuring of India's Infotech Sector

### Context:

India's IT sector is undergoing major restructuring as AI adoption accelerates, driving changes in business models, workforce strategies, and client services. Recent TCS moves, including hiring freezes and job cuts, reflect the industry's shift towards AI-first, efficiency-driven operations.


## About AI and the Restructuring of India's Infotech Sector:

### Drivers of the Shake-Up:

- Productivity Surge – AI tools for coding, debugging, and testing speed up software development, improving efficiency by over 30% and reducing delivery timelines.
- Shift in Business Models – Traditional manpower-heavy outsourcing is giving way to AI-driven, high-value, outcome-focused service delivery.
- Global Client Demands – International clients seek partners to modernise outdated systems, clean vast datasets, and comply with evolving AI regulations.
- Cost Optimisation Pressure – AI reduces operational costs by automating repetitive tasks, aligning with investor demands for better margins.
- Technology Maturity – Generative AI, low-code platforms, and automation are now stable, scalable, and ready for enterprise-level deployment.

### Opportunities for Indian IT Firms:

- Global AI Adoption Partners – Indian firms can help global companies implement AI responsibly, ensuring compliance and seamless integration.
- Niche Specialisation – Targeting AI solutions for specific sectors like healthcare, defence, and climate science opens high-value markets.
- Data Governance Expertise – Building AI models that prioritise privacy, fairness, and security to meet global data protection laws.
- Innovation Hubs – Leveraging India's STEM talent to create AI-driven intellectual property and commercial products.
- SME Advantage – Agile, AI-native small firms can deliver innovative solutions faster than large bureaucratic organisations.

### Challenges in the AI Transition:

- Workforce Displacement – Routine coding, maintenance, and back-office roles risk automation, affecting mid-level IT jobs.

- Skill Shortage – There is a mismatch between demand for AI-skilled professionals and current workforce capabilities.
- Cultural Shift Resistance – Firms and employees may struggle to adapt from billable-hour models to IP-led value creation.
- Regulatory Compliance – Meeting international AI ethics, transparency, and data privacy standards adds operational complexity.
- Infrastructure Gaps – Limited high-performance computing and research facilities slow AI innovation and scalability.

### Policy & Government Role:

- National AI Mission – Promotes AI research, infrastructure creation, and workforce skill development at a national scale.
- Digital India & Data Governance – Strengthens secure and responsible AI adoption through robust digital policies and privacy frameworks.
- Higher Education Reform – Integrates AI, ML, and ethics into academic curricula to prepare future-ready professionals.
- Incentives for AI Startups – Offers tax breaks, funding, and IP support to encourage deep-tech entrepreneurship.
- Global Tech Alliances – Builds strategic partnerships for AI research, product co-development, and international market entry.

### Way Forward:

- AI Reskilling Programmes – Launch mass-scale training to upskill existing IT talent for AI-centric roles.
- Ethical AI Leadership – Establish India as a global hub for certifying responsible and fair AI practices.
- Encouraging IP Creation – Promote AI innovation through patent support for algorithms, applications, and platforms.
- Support AI Clusters – Develop specialised AI hubs in major and emerging tech cities to spur innovation.
- Client-Centric Transformation – Shift positioning from outsourced vendor to strategic AI solutions partner for global clients.

### Conclusion:

AI is redefining India's infotech sector, shifting from the "back office of the world" to an AI-first innovation economy. Agility, niche expertise, and ethical leadership will drive success, requiring a move from scale-driven services to value-driven solutions that make Indian IT indispensable for global AI adoption.

## Revised Income Tax Bill, 2025

### Context:

Finance Minister has tabled the revised Income Tax Bill, 2025 in the Lok Sabha, incorporating most of the 566 recommendations made by the Parliamentary Select Committee.

### About Revised Income Tax Bill, 2025:

### What it is?

- A new legislation to consolidate, streamline, and modernise India's direct tax framework, replacing the six-decade-old Income Tax Act, 1961.

### Aim:

- Simplify compliance by removing outdated provisions and improving drafting clarity.
- Enhance transparency in tax administration.
- Incorporate stakeholder inputs for fairer tax practices.
- Facilitate ease of doing business through clear, consistent, and modern legal language.

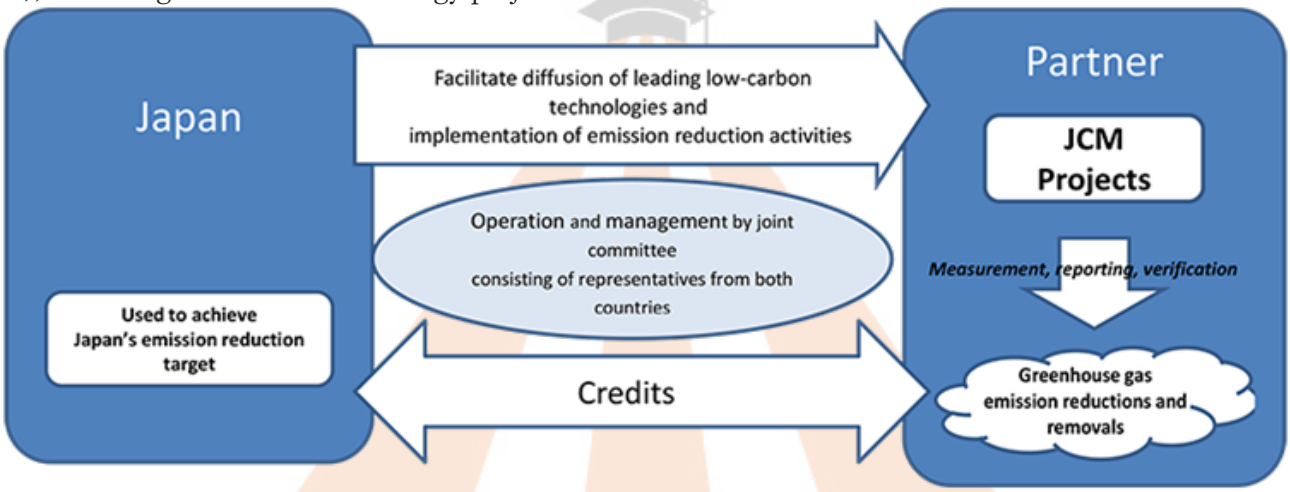
## Key Features of the Revised Bill:

- Single 'Tax Year' Concept: Replaces "Previous Year" and "Assessment Year" with a uniform term to simplify understanding and compliance.
- Simplified Refund Provisions: Refunds allowed even if ITR is filed after the due date, reducing taxpayer grievances.
- Corporate & MSME Relief: Rs 80M deduction for inter-corporate dividends restored and MSME definition aligned with MSME Act for uniformity.
- Rationalised Property Taxation: Notional rent on vacant property removed; clear deductions for municipal tax and interest on rented property.
- Compliance & Governance Reform: Unnecessary provisions removed, CBDT empowered for digital-era rule-making and NIL-TDS option for zero-liability taxpayers.
- Charitable Trust & LLP Relief: Relaxation in transfer pricing rules and removal of Alternate Minimum Tax on LLPs.
- Enhanced Digital Alignment: Structured section numbering, improved terminology, and cross-referencing for easier navigation and reduced ambiguity.

## Joint Crediting Mechanism (JCM)

### Context:

India and Japan have signed a Memorandum of Cooperation (MoC) to implement a Joint Crediting Mechanism (JCM), advancing low-carbon technology projects.




### About Joint Crediting Mechanism (JCM)

### What it is?

- A Japanese initiative that invests in low-carbon technologies in developing nations.
- Emission reductions achieved are credited partly to Japan's account, helping it meet its emission-reduction commitments.

### Objectives

1. Promote Technology Transfer – Facilitate flow of Japanese low-carbon technologies to India.
2. Mobilise Investment – Encourage financial flows for green projects and infrastructure.
3. Capacity Building – Strengthen domestic skills in handling advanced climate technologies.
4. Carbon Credit Trading – Enable India to trade credits with Japan under Article 6.2 of Paris Agreement.
5. Sustainable Development – Support India's shift towards clean energy and climate resilience.

### Features of the Indo-Japan Pact

- First-of-its-kind MoC on low-carbon cooperation.
- Covers equipment, machinery, systems, and infrastructure localisation.
- Overseen by India's National Designated Authority for Carbon Markets.

### Aligns with India's NDC goals:

- Cut emission intensity by 45% by 2030 (from 2005 levels).
- Achieve 50% installed power capacity from non-fossil fuels by 2030.
- Create 2.5–3 billion tonnes $CO_2$ sink through afforestation.

### Importance

- Diplomatic Value – Enhances Indo-Japan climate and technology partnership.
- Economic Benefit – Attracts investment, creates jobs in green industries.
- Environmental Impact – Supports India's renewable push and climate commitments.
- Global Leadership – Positions India as a key player in carbon markets.

# Project Aarohan

## Context:


The National Highways Authority of India (NHAI) has launched Project Aarohan to support the education of children of toll plaza workers.

## About Project Aarohan:

### What it is?

- A scholarship and mentorship program to support the educational aspirations of toll plaza employees' children, especially from economically weaker sections.
- Launched by: National Highways Authority of India (NHAI) in collaboration with Vertis Infrastructure Trust.
- Implemented by: SMEC Trust's Bharat Cares.

### Aim:

- To remove financial barriers to education.
- To provide equal access to quality education.
- To nurture talent among children of toll plaza staff and bridge socio-economic divides.

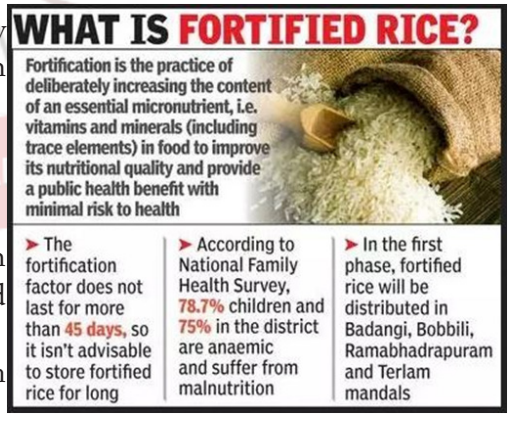
### Features:

- Coverage: 500 students (Class 11 to final year of graduation).
- Scholarships: 12,000 annually (FY 2025–26) for each selected student.
- Higher Studies Support: 50 bright students aspiring for PG and above to get 50,000 each.
- Beyond Finance: Mentorship, career guidance, skill-building workshops, and structured progress tracking.
- Fund Allocation: 1 crore for first phase (July 2025–March 2026).
- Application Process: Online portal; requires academic records, income proof, caste certificate, ID proof, etc.
- Inclusivity: Priority to girls, first-generation learners, and students from EWS, SC, ST, OBC, and minority communities.

# Fortified Rice Scheme Extended till 2028

## Context:

The Union Cabinet has approved the continuation of universal supply of fortified rice under all government schemes till December 2028 with 100% central funding of 17,082 crore.




## About Fortified Rice Scheme:

### What it is

- A nutrition intervention programme to supply rice fortified with Iron, Folic Acid, and Vitamin B12 through government food safety nets.
- Aims to combat anaemia, malnutrition, and hidden hunger in India.

### Started in

- Pilot phase launched in 2019.
- National scale-up approved in 2022 for universal coverage.

### Nodal Ministry & Agency

- Department of Food and Public Distribution (DFPD) under the Ministry of Consumer Affairs, Food and Public Distribution.
- Technical standards framed by FSSAI (Food Safety and Standards Authority of India).

### Components of the Scheme

1. Public Distribution System (PDS) – fortified rice distributed through ration shops.
2. PM POSHAN (Mid-Day Meal) – fortified staples in school meals to address child anaemia.
3. Integrated Child Development Services (ICDS) – supply for children and women beneficiaries.
4. Special Nutrition Initiatives – distribution under Wheat-Based Nutrition Programme (WBNP) and Scheme for Adolescent Girls (SAG).

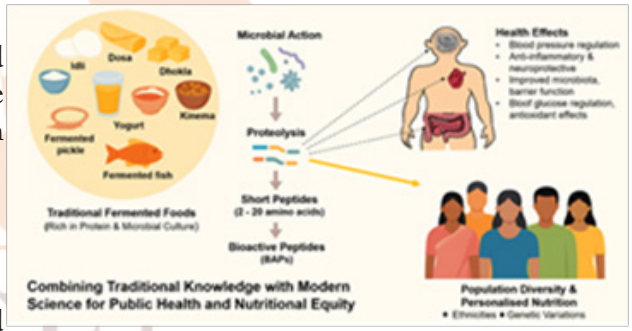
### Key Features

- Universal Coverage: By March 2024, fortified rice replaced normal rice in all central schemes.
- Nutritional Focus: Added Iron, Folic Acid, and Vitamin B12 to address anaemia, neurological, and cognitive deficiencies.
- Cost Coverage: Entire fortification cost borne by Government of India.
- Complementary Fortified Foods: Guidelines promote use of Double Fortified Salt (DFS) and fortified edible oil in PM POSHAN.
- Multi-Sectoral Convergence: Linked with Anemia Mukt Bharat (2018) and nutrition awareness drives.
- Monitoring: States and UTs to ensure quality, compliance, and proper distribution.
- Partnerships: Supported by NDDB Foundation for Nutrition (Gift Milk Programme) to enhance complementary nutrition in schools.

## Bioactive Peptides

### Context:

A study by the Institute of Advanced Study in Science and Technology (IASST), Guwahati, has shown that bioactive peptides in fermented foods can have population-specific health benefits, paving the way for personalised nutrition in India.




### About Bioactive Peptides:

### What it is?

- Short protein fragments (2–20 amino acids) formed during fermentation of foods such as yogurt, idli, miso, kimchi, natto, and fermented fish.
- Known for antimicrobial, antihypertensive, antioxidant, and immune-modulatory properties.

### Aim:

- To assess the health benefits of BAPs in regulating blood pressure, blood sugar, immunity, and inflammation.
- To explore precision nutrition solutions tailored to India's genetically and culturally diverse population.

### Key Features:

- Mechanism: Interact with biomolecules via electrostatic forces, hydrogen bonds, and hydrophobic interactions.
- Health Impact: Influence cardiac function, metabolic health, and immune response.
- Personalised Response: Effectiveness varies due to genetic polymorphisms (e.g., ACE, IL-6), gut microbiota differences, and dietary habits.
- Research Tools: Encourages use of omics-based approaches for deeper analysis.

### Significance:

- Public Health Potential: Can be integrated into dietary guidelines to address hypertension, diabetes, and immunity-related disorders.
- Cultural Relevance: Promotes India's traditional fermented foods in global nutrition science.

# UPSC Marking 100 Years of Commitment to Merit and Public Service

## Context:

The Union Public Service Commission (UPSC) will mark its centenary year from 1 October 2025 to 1 October 2026, celebrating 100 years of transparent, merit-based recruitment for India's civil services.

## About UPSC Marking 100 Years of Commitment to Merit and Public Service:

### What it is?

- The UPSC is India's premier constitutional authority for recruiting top-level government officers through a fair, competitive examination process.
- Established in: 1 October 1926, following the recommendations of the Lee Commission (1924) and provisions of the Government of India Act, 1919.

सत्यमेव जयते

UPSC

### Objective:

- Ensure meritocracy and fairness in public service recruitment.
- Select candidates through rigorous, impartial, and transparent examinations and interviews.
- Maintain the highest standards of integrity and competence in public administration.

### Historical Evolution of Civil Services in India

#### Pre-1854 – Patronage System

- East India Company civil servants were nominated, trained at Haileybury College (London), and sent to India.

#### 1854 – Macaulay Reforms

- Introduction of competitive exams for the Indian Civil Service (ICS) held in London (from 1855).
- First Indian to succeed: Satyendranath Tagore (1864).

#### 1922 – Exams in India

- Civil Service exams began in Allahabad and later Delhi, alongside London exams.
- 1926 – Public Service Commission Established
- First Chairman: Sir Ross Barker.
- Initially had 4 members + chairman and functions under Public Service Commission (Functions) Rules, 1926.

#### 1937 – Federal Public Service Commission

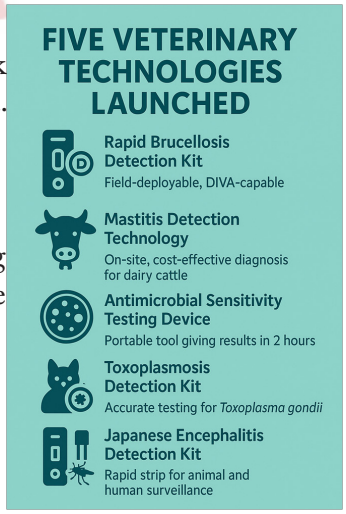
- Created under Government of India Act, 1935 for the Federation of India.
- 1950 – Union Public Service Commission
- Came into existence with the Constitution of India; powers defined in Articles 315–323.



# India's first State-of-the-Art Animal Stem Cell Biobank and Laboratory

## Context:

Union Minister inaugurated India's first State-of-the-Art Animal Stem Cell Biobank and Laboratory at the National Institute of Animal Biotechnology (NIAB), Hyderabad.




## About India's first State-of-the-Art Animal Stem Cell Biobank and Laboratory:

### What It Is?

- A cutting-edge facility dedicated to preserving, researching, and utilising animal stem cells for regenerative medicine, disease modelling, and reproductive biotechnology in livestock.

### Location: Hyderabad, Telangana

- Situated at the National Institute of Animal Biotechnology (NIAB)

### Organisation Involved:

- National Institute of Animal Biotechnology (NIAB) – under the Department of Biotechnology (DBT)
- Supported by National Biopharma Mission (NBM) of DBT–BIRAC

### Aim:

- Enhance veterinary health innovation through regenerative medicine and cellular therapies.
- Support One Health approach by linking human, animal, and environmental health.
- Strengthen India's capacity in biotechnology-based agricultural productivity.

### Key Features:

- Advanced Infrastructure – Stem cell culture unit, 3D bioprinter, bacterial culture lab, cryostorage, autoclave rooms.
- Support Systems – Modern air handling units and uninterrupted power backup.

### Research Areas –

- Regenerative medicine for livestock
- Disease modelling for brucellosis, mastitis, and other diseases
- Tissue engineering & reproductive biotech

## Definitive list of Ayurveda Aahara Products

### Context:

The FSSAI, in collaboration with the Ministry of Ayush, released a definitive list of Ayurveda Aahara products to standardize traditional Ayurvedic food formulations under modern food safety regulations.


### About Definitive list of Ayurveda Aahara Products:

### What is Ayurveda Aahara?

- Ayurveda Aahara refers to food products formulated as per the dietary principles of Ayurveda, focusing on balance, seasonality, and the use of natural and therapeutic ingredients for holistic wellness.

### Launched by:

- Food Safety and Standards Authority of India (FSSAI)
- In collaboration with the Ministry of Ayush
- Under the Food Safety and Standards (Ayurveda Aahara) Regulations, 2022

### Objective:

- To mainstream traditional dietary knowledge rooted in Ayurveda.
- To offer clarity and regulatory support to Food Business Operators (FBOs).
- To enhance public trust and adoption of Ayurveda-based nutrition for preventive healthcare.

### Key Features:

- Authenticity Through Textual Validation: The definitive list is based on recipes and methods sourced from classical Ayurvedic texts listed in Schedule A.
- Clarity for Food Businesses: Provides a credible regulatory guide for FBOs to manufacture Ayurveda Aahara products within a defined framework.
- Public Health Focus: Encourages use of time-tested dietary practices that support digestion, immunity, and long-term wellness.

- Structured Addition Mechanism: FBOs can request inclusion of new products with valid references from classical Ayurvedic scriptures.
- Guidance by National Institute of Ayurveda (NIA): The nodal agency curated and validated formulations to ensure scientific rigour and traditional fidelity.

### Significance:

- Bridges Tradition and Regulation: Aligns India's ancient food wisdom with modern food safety standards, enhancing public credibility.
- Empowers FBOs and Startups: Boosts the Ayurveda food sector by reducing regulatory ambiguity and facilitating product innovation.
- Promotes Preventive Healthcare: Supports balanced, sustainable living by reviving herbal and seasonal eating practices.

## India's Joint Doctrines for Cyberspace Operations

### Context:

The Chief of Defence Staff (CDS) has declassified and released India's Joint Doctrines for Cyberspace Operations and Amphibious Operations to enhance interoperability, strengthen national defence strategy, and guide integrated multi-domain warfare.

### About India's Joint Doctrines for Cyberspace Operations:

### What is Cyberspace?

- A global domain comprising interconnected information systems, networks, and data infrastructures, including the internet, intranets, communication satellites, and control systems.
- Functions as a critical operational environment where information is created, transmitted, manipulated, and stored.

### Features of Cyberspace:

1. Borderless Domain – Operates beyond physical boundaries.
2. Dual-use Nature – Serves both civilian and military purposes.
3. Real-time Impact – Actions can produce immediate global effects.
4. Anonymity & Attribution Challenges – Difficulty in tracing actors.
5. Constantly Evolving Threats – Adapts with technological change.

### About Amphibious Operations:

### What are Amphibious Operations?

- Coordinated military actions launched from the sea by naval, air, and land forces to achieve a mission ashore.
- Used in warfare, humanitarian assistance, disaster relief (HADR), and force projection in contested zones.

### Features of Amphibious Operations:

1. Tri-service Integration – Combines maritime, aerial, and ground forces.
2. Rapid Response – Quick mobilisation from sea to shore.
3. Flexible Mission Profiles – Ranges from combat to HADR.
4. Strategic Reach – Extends influence over island territories and coastal areas.
5. Maritime–Land Linkage – Bridges sea-based capabilities with on-ground objectives.

### Components of Cyberspace Operations:

- Defensive Cyber Operations – Involves shielding military and national networks from hacking, malware, and data breaches through proactive monitoring and security protocols.
- Offensive Cyber Operations – Focuses on penetrating enemy systems to disable communications, disrupt command structures, or damage critical infrastructure.
- Cyber Intelligence & Reconnaissance – Collects and analyses cyber threat data to identify vulnerabilities, anticipate attacks, and inform operational planning.
- Cyber Support Operations – Provides technical assistance and digital tools to enhance capabilities in land, air, maritime, and space operations.
- Resilience & Recovery Systems – Establishes backup systems, redundancies, and rapid restoration measures to maintain mission continuity during cyber crises.

### Operational Principles of Cyberspace Operations:

- Threat-informed Planning – Relies on current and accurate intelligence to design effective, targeted cyber strategies.
- Interoperability – Ensures smooth coordination between armed services and civil agencies for unified cyber responses.
- Layered Defence – Employs multiple security layers, from firewalls to advanced intrusion detection, to neutralise threats early.
- Legal & Ethical Compliance – Operates within domestic laws and international cyber norms to maintain legitimacy and credibility.
- Real-time Response – Enables immediate identification and counteraction to cyber incidents, minimising damage.

### Significance:

- National Security – Protects critical infrastructure like power grids, defence networks, and communication systems from hostile actors.
- Force Multiplier – Amplifies the effectiveness of military operations by integrating cyber tools with traditional warfare tactics.
- Maritime Superiority – Amphibious operations ensure dominance in littoral zones, safeguarding India's maritime interests.
- Jointness in Armed Forces – Promotes synergy among Army, Navy, and Air Force, eliminating duplication of efforts.
- Preparedness for Hybrid Warfare – Equips forces to tackle blended threats involving cyber-attacks, sea control, and land combat simultaneously.
- Diplomatic Signalling – Sends a clear message to the world about India's capability and determination in defending its multi-domain interests.

### Conclusion:

The declassified doctrines on Cyberspace and Amphibious Operations mark a strategic leap in India's defence preparedness. They strengthen tri-service integration, safeguard national security interests, and prepare the forces for hybrid, multi-domain conflicts.

## National Anubhav Awards


### Context:

The National Anubhav Awards 2025 will be held on 18 August 2025 at Vigyan Bhawan, New Delhi, marking the 10th anniversary of the awards.

### About National Anubhav Awards:

### What is it?

- The National Anubhav Awards are annual honours recognizing outstanding memoirs by retiring or recently retired Central Government employees, highlighting their experiences and contributions to

## Awarded by:

- Department of Pension & Pensioners' Welfare (DoPPW), Ministry of Personnel, Public Grievances and Pensions, Government of India.

## Launched in:

- 2015, as envisioned by the Prime Minister, Shri Narendra Modi.
- Part of the Anubhav Portal initiative to document institutional memory through personal narratives.

## Aim:

- Preserve institutional memory for better governance.
- Encourage knowledge-sharing and replication of good practices.
- Recognize valuable feedback, innovation, and service excellence.

## Eligibility:

- Central Government employees, employees of Central Public Sector Undertakings (CPSUs), and Public Sector Banks.
- Must be retiring within 8 months or retired within the last 3 years.
- Write-ups must be published on the Anubhav Portal between 1 April 2024 and 31 March 2025.

## Features

- Categories covered: Accounts, administration, governance reforms, IT, research, procedural simplification, public dealing, valor, feedback, and more.
- Awards structure: 5 Best Write-ups + 10 Jury Certificates for other exceptional submissions.
- Diversity: One-third of awardees in 2025 are women.
- Recognition expansion: Includes employees from PSBs and CPSUs since 2024.
- Assessment: Objective marking system introduced for transparency.
- Capacity building: "Anubhav Awardees' Speak" webinar series for sharing experiences with soon-to-retire employees.

Chapter-
8

# INTERNATIONAL RELATION

## Shanghai Cooperation Organization (SCO)

### Context:

Prime Minister Narendra Modi will attend the 25th SCO Heads of State Council Summit in Tianjin, China, on August 31, 2025.


### About Shanghai Cooperation Organization (SCO)

### What it is?

- A regional intergovernmental organisation focusing on political, economic, and security cooperation.

### Established in

- 2001 at Shanghai, evolving from the "Shanghai Five" grouping (1996).

### Headquarters

- Beijing, China.

### Membership

- 8 Permanent Members: China, Russia, India, Pakistan, Kazakhstan, Kyrgyzstan, Tajikistan, Uzbekistan.
- Observers: Afghanistan, Belarus, Mongolia, Iran (now moving towards full membership).
- Dialogue Partners: Turkey, Sri Lanka, Nepal, Egypt, Saudi Arabia, Qatar, etc.

### Objectives

1. Promote regional peace and stability.
2. Strengthen cooperation against terrorism, separatism, and extremism.
3. Enhance economic connectivity and trade integration.
4. Encourage cultural exchange and people-to-people contact.
5. Uphold the principle of multipolarity and non-interference in internal affairs.

### Major Initiatives

- Regional Anti-Terrorist Structure (RATS) headquartered in Tashkent.
- SCO Development Bank proposal for financial cooperation.
- Initiatives in energy security, transport corridors, agriculture, digital economy, and cultural exchanges.
- Annual joint military exercises (Peace Mission series).

### 2025 SCO Summit Highlights (Tianjin, China)

- Hosted by: China (its 5th time hosting).
- Theme: "Upholding the Shanghai Spirit: SCO on the Move".

### Focus Areas:

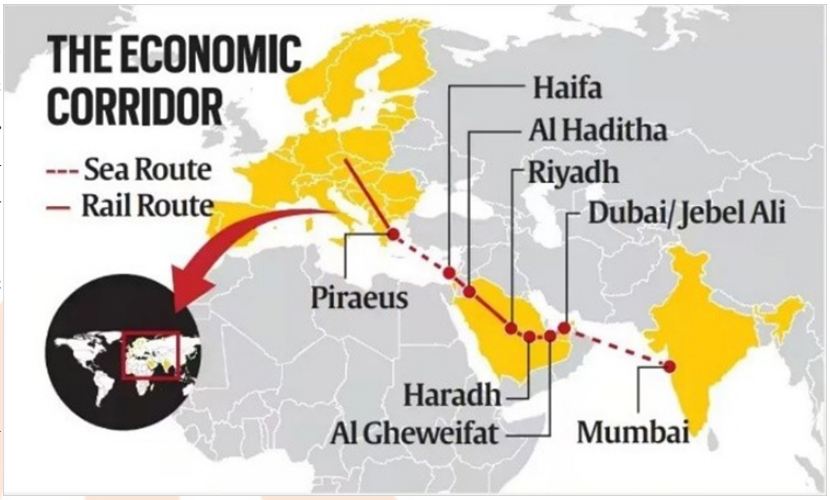
- Adoption of a ten-year development strategy (2025–2035).
- Review of 25 years of SCO achievements.
- Regional security and counter-terrorism cooperation.

- Strengthening trade, energy, and connectivity projects.
- Push for sustainable development and climate action.
- Participation: 20+ world leaders and 10 heads of international organisations.
- India's Role: To advance regional connectivity, anti-terror collaboration, energy cooperation, and sustainable growth, balancing ties with Russia, China, and Central Asia.

## India–Middle East–Europe Economic Corridor & Gaza War

### Context:

India hosted envoys from partner nations to discuss progress on the India-Middle East-Europe Economic Corridor (IMEC). Talks focused on trade, energy, and digital connectivity despite delays caused by the Gaza conflict.




### About India–Middle East–Europe Economic Corridor & Gaza War:

### Genesis and Objectives of IMEC

- Launched: G20 Summit, New Delhi (Sept 2023).
- Partners: India, Saudi Arabia, UAE, EU, France, Italy, Germany, US, Israel, Jordan.

### Structure:

- Eastern Leg – India's western ports UAE (sea) Saudi Arabia, Jordan (rail) Haifa, Israel (port).
- Western Leg – Haifa Greece/Italy (sea) onward into Europe via existing rail network.

### Key Components:

- High-speed freight rail across the Arabian Peninsula.
- Energy pipelines for clean hydrogen.
- Digital infrastructure (subsea cables, e.g., Blue Raman project: Mumbai–Genoa).
- Trade facilitation measures to boost efficiency and lower costs.

### Strategic Significance for India:

### Trade and Economic Integration:

- EU is India's largest trading partner ($137.41 bn in FY 2023-24).
- Enhanced connectivity can diversify trade routes away from chokepoints like the Suez Canal and Red Sea.

### Energy Security:

- Opportunity to participate in green hydrogen supply chains.
- Integration with Gulf energy infrastructure supports India's clean energy transition.

### Digital & Data Connectivity:

- India's role as a technology hub strengthens via subsea cable projects.
- Digital corridors can complement AI and fintech growth.

### Strategic Leverage:

- Positions India as a central actor linking three geostrategic theatres — Asia, Middle East, and Europe.
- Counters China's BRI by offering an alternative connectivity architecture.

### Opportunities for India:

- Expanded Market Access – IMEC enables faster, cheaper access to the EU, reducing reliance on the Suez Canal and boosting export competitiveness.
- Energy Transition Leadership – Green hydrogen pipelines allow India to become a clean energy supplier to Europe and Gulf partners.

- Digital Infrastructure Hub – The Blue Raman subsea cable positions India as the central node for Asia-Europe data connectivity.
- Supply Chain Diversification – Alternate routes reduce risks from Red Sea or Hormuz disruptions, attracting global manufacturing investments.
- Strategic Geopolitical Leverage – As IMEC's eastern anchor, India gains influence in setting trade norms and countering China's BRI.

### Challenges:

### Geopolitical Instability:

- Israel's war in Gaza has derailed regional normalisation efforts (e.g., Saudi-Israel rapprochement).
- Jordan-Israel relations at a significant low and Gulf states cautious on integration with Israel.

### Economic Rivalries in the Gulf:

- Saudi-UAE competition for logistics hub dominance can delay alignment on IMEC's operational design.

### Infrastructure Gaps:

- Cross-Saudi/UAE high-speed freight railway remains underdeveloped.
- Lack of corridor-wide tariff harmonisation, insurance mechanisms, and port capacity parity.

### Security Risks:

- Expansion of regional conflicts (Yemen, Lebanon, Syria) could increase insurance premiums and discourage private investment.

### Current Status:

- Eastern Leg: Strong potential due to India-Gulf partnerships; UPI adoption in UAE and Saudi enhances digital trade readiness.
- Western Leg: Uncertain until Middle East conflict de-escalates; implementation contingent on Palestinian issue resolution.
- August 2025 Delhi meeting of partner envoys focused on modalities and trade facilitation, not full-scale implementation.

### Way Forward for India:

- Prioritise Eastern Leg Development: Strengthen maritime and rail linkages with Gulf partners independent of Israel leg.
- Enhance Energy Diplomacy: Fast-track green hydrogen cooperation with Gulf for exports to Europe.
- Invest in Digital Infrastructure: Lead in subsea cable networks and digital corridor architecture.
- Diversify Port Linkages: Explore multiple Indian and European terminal points to avoid bottlenecks.
- Diplomatic Balancing: Engage all stakeholders while maintaining neutrality on regional conflicts to safeguard corridor viability.

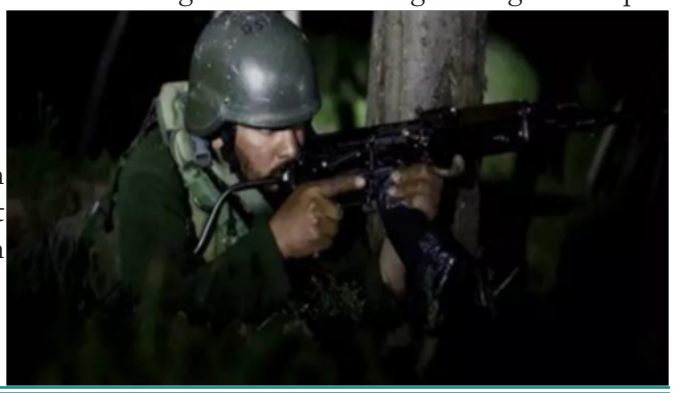
### Conclusion:

The IMEC holds immense potential to transform trade, energy, and digital connectivity between Asia, the Middle East, and Europe. However, its success hinges on regional stability and diplomatic consensus among all stakeholders. For India, strategic patience and focused development of the eastern leg could secure long-term gains despite current challenges.

## Operation Akhal

### Context:

Operation Akhal, a joint anti-terror operation in Kulgam district of Jammu and Kashmir, entered its third day, with at least one terrorist killed amid continued firefight by Indian security forces.



## About Operation Akhal:

### What it is?

- A high-intensity counter-terrorism operation launched in the Akhal Khulsan forest area of Kulgam, Jammu & Kashmir.
- Launched by: Jointly conducted by the Indian Army's Chinar Corps, Jammu & Kashmir Police, and the Special Operations Group (SOG).
- Aim: To neutralize 3–5 terrorists based on intelligence inputs, tighten internal security, and dismantle local terror modules.

### Key Features:

- Ongoing encounter involving intermittent and calibrated fire.
- Part of a broader post-Pahalgam crackdown on terrorist groups and their support networks.
- Complemented by actions against hawala networks, drug smugglers, and OGWs (Overground Workers).

# 9 DEFENCE

## Integrated Air Defence Weapon System (IADWS)

### Context:

India successfully conducted the maiden flight-tests of the Integrated Air Defence Weapon System (IADWS) off the coast of Odisha.

### About Integrated Air Defence Weapon System (IADWS):

### What it is?

- A multi-layered, network-centric air defence system developed by DRDO under Project Sudarshan Chakra.
- Integrates Quick Reaction Surface-to-Air Missile (QRSAM), Very Short Range Air Defence System (VSHORADS), and Directed Energy Weapon (DEW) into a unified command system.
- Developed by: Defence Research & Development Organisation (DRDO).

### Aim:

- To provide comprehensive protection for military and national assets (airbases, radar sites, command centres, nuclear and space installations, power plants).
- To counter modern aerial threats – from high-speed aircraft and cruise missiles to drones, swarm UAVs, and loitering munitions.

### How it Works?

- Centralised Command & Control Centre (C2C2): Integrates radar + electro-optical sensor feeds to generate a real-time air picture.
- Threat Allocation: Based on target speed, altitude, and trajectory, C2C2 assigns the most effective weapon.
- QRSAM (outer layer): Engages fast jets, helicopters, and cruise missiles at 25–30 km range, ~10 km altitude.
- VSHORADS (middle layer): Infrared-seeker based, effective against low-flying UAVs/helis within 6 km range, 4 km altitude.
- Directed Energy Weapon (inner layer): High-power laser neutralises drones and loitering munitions at close range; cost-effective with unlimited firing capacity.

### Features:

- Indigenous design with advanced radars, sensors, and communication systems.
- Multi-layered shield combining kinetic interceptors (missiles) and non-kinetic weapons (laser).
- Real-time coordination ensures simultaneous tracking and engagement of multiple targets.
- Rapid reaction & mobility for deployment in forward areas.
- Area Defence for high-value facilities against diverse aerial threats.

## Mission Sudarshan Chakra

### Context:

On India's 79th Independence Day, Prime Minister of India announced the launch of Mission Sudarshan Chakra, a multi-layered indigenous defence initiative to protect India's strategic, civilian, and religious sites from enemy attacks.

### About Mission Sudarshan Chakra:

### What it is?

- A national security mission aimed at creating an advanced, multi-layered shield around critical installations across India.
- Inspired by the mythological Sudarshan Chakra of Lord Krishna, blending cultural ethos with modern strategic defence.

### Nodal Ministry: Ministry of Defence.

### Objective:

- To develop an indigenous, research-based security system to neutralise threats from air, land, sea, and cyber domains.
- Ensure self-reliance (Aatmanirbhar Bharat) in critical defence technology.
- Provide proactive, integrated protection for vital infrastructure, cities, and sacred places.

### Features:

- Multi-Layered Defence: Integrates surveillance, interception, and counter-attack capabilities.
- Comprehensive Coverage: Protects strategic, civilian, and religious sites.
- Advanced Technology: Combines radar, AI-enabled tracking, cyber defence, and physical security systems.
- Indigenous Development: Entirely designed, developed, and produced in India.
- Long-Term Plan: Expansion, modernisation, and strengthening of the system by 2035.

### Significance:

- Strategic Deterrence: Comparable in vision to Israel's Iron Dome, adapted for India's diverse threat landscape.
- National Sovereignty: Reduces dependence on foreign defence systems.
- Comprehensive Security: Shields against conventional, hybrid, and cyber threats.

Chapter-
10

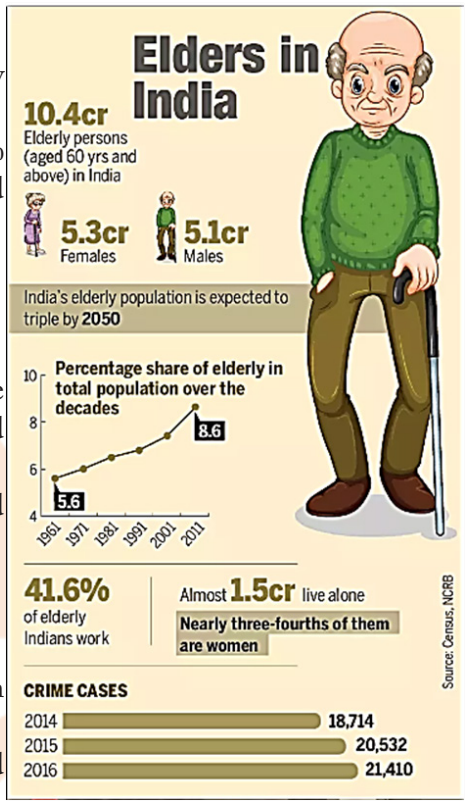
# SOCIAL ISSUES

## Protecting India's Geriatric Population from the Rising Heat Burden

### Context:

Heatwaves are becoming more frequent and severe in India, raising mortality among older adults.

- A study shows heat-related deaths among India's elderly rose by 55% between 2000–04 and 2017–21, with states like Uttar Pradesh and Rajasthan worst affected.




### About Geriatric Population:

### What it is?

- The geriatric population refers to people aged 65 years and above who experience physiological decline in immunity, metabolism, and resilience.
- They are more prone to chronic diseases, mobility issues, and environmental stressors like extreme heat.

### India's Geriatric Population

- In 2022, 10.5% of India's population was elderly (~14 crore people).
- By 2050, this share is projected to nearly double, surpassing the youth population.
- 71% of elderly live in rural areas, often with poor infrastructure and limited healthcare.
- Elderly women outnumber men by 4 million (71 million women vs 67 million men), especially vulnerable due to gendered roles and poverty.

### Causes of Heat-Related Vulnerability in the Elderly

#### 1. Biological Factors

- Reduced sweating, impaired blood circulation, and poor thermoregulation make it difficult for older adults to cool their bodies.
- Pre-existing conditions (heart, kidney, mental health) amplify risks.

#### 2. Dehydration and Thirst Perception

- Elderly individuals often fail to feel thirsty, leading to low fluid intake, electrolyte imbalance, and kidney stress.

#### 3. Gender Dimensions

- Elderly women face prolonged heat exposure in non-ventilated kitchens, caregiving burdens, and limited access to resources.
- Elderly men continue outdoor labour in farming or construction, with inadequate hydration and protective breaks.

#### 4. Tropical Nights Effect

- When night temperatures remain above 20°C, older bodies fail to recover from daytime heat, straining cardiovascular and respiratory health.

### 5. Social Isolation and Poverty

- Living alone delays help-seeking. Lack of social participation worsens mental health and reduces adaptive capacity.

## Current Gaps in Protection

- Policy Blind Spot: Heat Action Plans exist but lack elderly-specific strategies.
- Data Discrepancy: NCRB and NDMA report widely different figures on heat deaths, limiting targeted planning.
- Affordability of Cooling Tech: Innovations like thermoelectric garments remain out of reach for poor rural elderly.
- Weak Surveillance: No robust system to track heat mortality in real time, or to map urban heat islands.
- Gendered Neglect: Women's vulnerabilities (domestic confinement, resource inequality) are rarely acknowledged in policies.

## Solutions and Strategic Action

### 1. Targeted Social Protection

- Subsidise cooling devices, hydration packs, and energy support for poor elderly households in heatwave zones.

### 2. Health System Strengthening

- Train ASHA workers, health staff, and disaster teams to detect and treat heat stroke among elderly populations.
- Establish temporary cooling centres in rural blocks and urban wards.

### 3. Data and Research

- Publish real-time heat mortality data.
- Encourage scientific studies on how income, gender, and disease conditions shape heat vulnerabilities.

### 4. Technology Access

- Scale low-cost cooling technologies under MoHFW with subsidies and PLI incentives for mass production.

### 5. Institutional Coordination

- Regular meetings between Health, Environment, Urban Development, and Agriculture ministries to refine State and National Heat Action Plans.

### 6. Early Warning Systems

- Develop a unified mobile app integrating IMD's UMANG, MAUSAM, Meghdoot, and Damini apps to issue heat alerts.
- Use social media for real-time outreach in local languages.

### 7. Long-Term Climate Action

- Transition to renewables and low-carbon strategies to curb fossil-fuel-driven warming.
- Promote sustainable housing designs with ventilation for rural elderly.

## Conclusion

India's geriatric population is expanding rapidly, just as heatwaves are intensifying. This convergence makes the elderly highly vulnerable to climate stress. Protecting them requires elderly-focused heat action plans, better data, subsidised cooling solutions, and stronger social protection systems.

# Pradhan Mantri Jan Dhan Yojana: Eleven Years of Financial Inclusion

## Context:

PMJDY completes 11 years on August 28, 2025, emerging as the world's largest financial inclusion programme.

- Nearly 100% households and over 90% adults in India now have a bank account.


## About Pradhan Mantri Jan Dhan Yojana

### What is PMJDY?

- Launched in 2014, PMJDY was designed to provide universal access to banking for the unbanked.
- Its objectives include zero-balance accounts, RuPay debit cards, insurance, pensions, and Direct Benefit Transfers (DBTs).
- The scheme has reduced reliance on moneylenders and informal credit networks, historically a trap for the poor.

### Progress Over 11 Years

#### 1. Massive Account Growth

- Over 56.2 crore accounts opened, compared to ~15 crore in 2015.
- This represents the world's largest financial inclusion drive.

#### 2. Gender Inclusion

- 56% of accounts are held by women, reflecting PMJDY's role in empowering female participation in financial decisions.

#### 3. Rural Penetration

- 37.5 crore accounts belong to rural/semi-urban areas.
- Over 16.2 lakh banking correspondents ("Bank Mitras") provide doorstep access in remote villages.

#### 4. Deposits Expansion

- Total balance stands at 2.68 lakh crore, up 17 times since 2015.
- Indicates a shift from mere account opening to actual savings behaviour.

#### 5. Digital Ecosystem

- More than 38.7 crore RuPay cards issued.
- Enabled surge in UPI-based transactions, strengthening India's digital economy.

### Impact of PMJDY

- Direct Benefit Transfers (DBT): Subsidies for LPG, pensions, and Covid-relief payments reached beneficiaries without intermediaries, reducing corruption and leakage.
- Crisis Response: During demonetisation (2016) and the Covid-19 pandemic, Jan Dhan accounts enabled rapid cash transfers to millions of poor households.
- Financial Security: Linked with micro-insurance (PMJJBY, PMSBY) and pensions (Atal Pension Yojana), giving the unorganised sector a basic social safety net.
- Banking Access: Today, 99.9% villages have a bank branch, correspondent, or India Post Payments Bank outlet within 5 km — a milestone in rural inclusion.

### Issues and Challenges

#### 1. Dormant Accounts

- A proportion of Jan Dhan accounts remain inactive, showing limited usage beyond initial opening.

#### 2. Credit Gap

- Many account holders lack access to formal credit facilities, still relying on microfinance or informal lenders.

#### 3. Digital Divide

- In Tier 4 & Tier 5 centres, poor smartphone penetration and low digital literacy limit full benefits of digital banking.

#### 4. Financial Literacy Deficit

- Many beneficiaries are unaware of insurance and pension schemes linked to PMJDY, restricting long-term empowerment.

#### 5. Overdependence on DBTs

- Accounts are heavily used for subsidy inflows but less for investment or productive economic activity.

### Way Forward

- Revive Dormant Accounts: Conduct awareness drives and incentivise regular transactions.
- Expand Credit Linkages: Integrate PMJDY with microcredit and small loans, enabling entrepreneurship.
- Promote Financial Literacy: Use local languages and community campaigns to spread awareness about savings, insurance, and pensions.
- Leverage Technology: Develop voice-based and AI-driven banking tools for low-literacy populations without smartphones.
- Deepen Social Security: Broaden Jan Suraksha schemes so more informal workers gain insurance and pension coverage.
- Encourage Savings-Investment: Use rising balances in Jan Dhan accounts to connect beneficiaries with small savings, mutual funds, and other financial products.

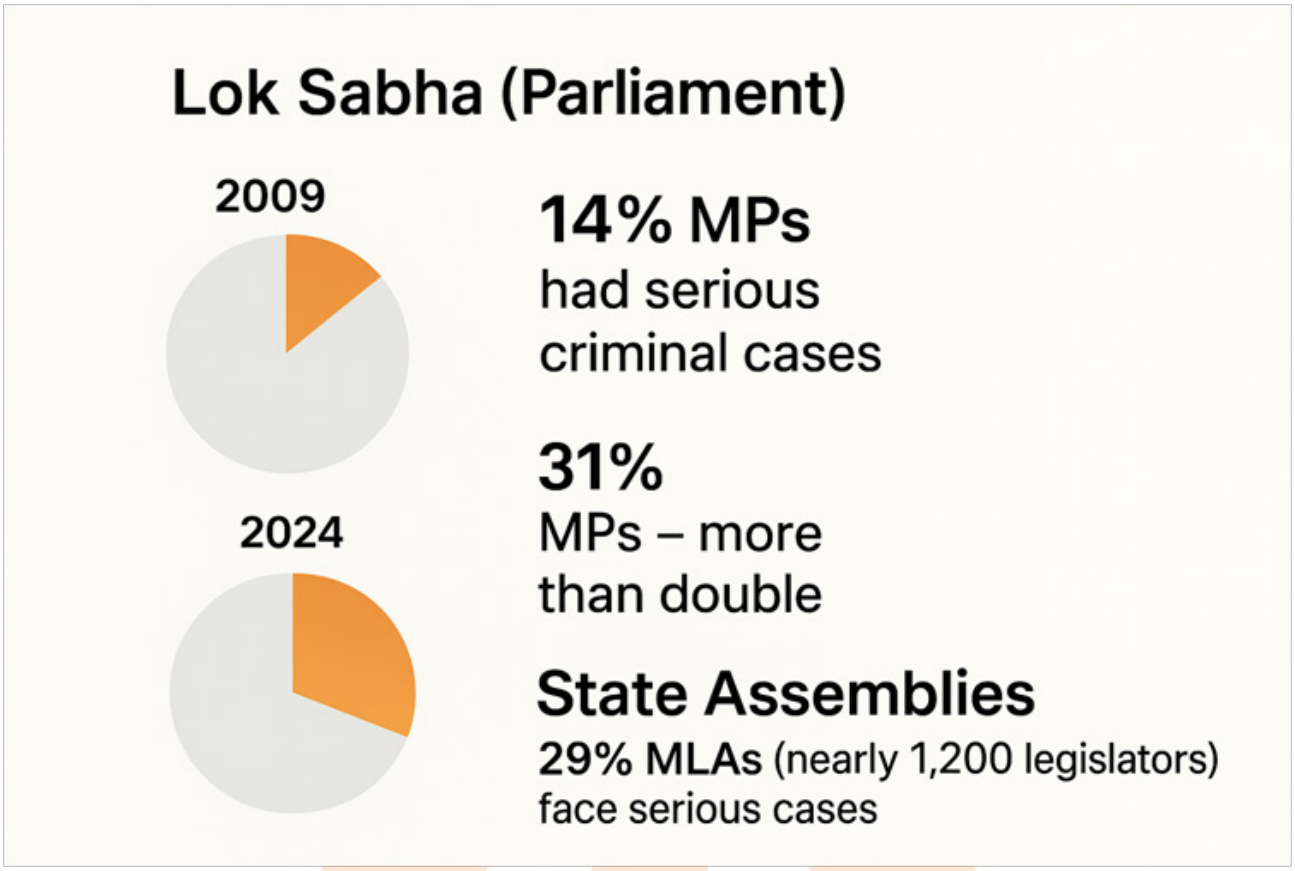
### Conclusion

PMJDY has emerged as the largest financial inclusion initiative in the world, transforming how subsidies are delivered and empowering marginalised households. Yet, its success will be complete only when accounts are used actively for savings, credit, and insurance, not just DBT inflows. The next decade must focus on financial literacy, technology-driven access, and credit empowerment, turning Jan Dhan into a true driver of inclusive growth and social security.

## Criminalisation of Politics

### Context:

A recent analysis shows that about 30% of MPs and MLAs in India face serious criminal cases, with the share of such MPs having more than doubled since 2009.




## About Criminalisation of Politics:

### What it is?

- Entry of individuals with serious criminal charges (offences punishable by ≥5 years, non-bailable offences) into legislative bodies.

### Lok Sabha (Parliament):

- In 2009, only 14% MPs had serious criminal cases.
- By 2024, this has risen to 31% MPs – more than double.
- Telangana has the highest share 71% MPs face serious cases.
- Bihar comes next with 48% MPs.
- Uttar Pradesh has the highest number in total 34 MPs.

### State Assemblies:

- In 2024, about 29% MLAs (nearly 1,200 legislators) face serious cases.
- Andhra Pradesh has the highest share 56% MLAs.
- Telangana follows with 50% MLAs.
- Uttar Pradesh has the highest number 154 MLAs (38% of the State's legislators).

## What True Empowerment of Women Entails

### Context:


The recent case of a domestic help in Karnataka who stood firm against a powerful politician highlights how true empowerment goes beyond applause — it requires systemic support for survivors of abuse.

### About Women Empowerment

### What is Women Empowerment?

- Definition: The process of enabling women to exercise agency over their lives, access equal

opportunities, and participate fully in social, economic, and political spheres.

- True empowerment is not only representation in boardrooms and parliaments, but also protection and rehabilitation of women at the margins who stand against entrenched power.

## Causes Behind Weak Empowerment

### 1. Patriarchal Social Structure

- Patriarchy shapes family, workplace, and community norms. Women are often silenced when they seek justice.
- Example: Victims of sexual harassment face character assassination and social boycott, discouraging others from reporting crimes.

### 2. Tokenism in Empowerment

- Women CEOs, entrepreneurs, and politicians are showcased as role models, but grassroots survivors are ignored.
- Empowerment narratives often remain limited to urban elite spaces, excluding domestic workers, rural women, and marginalized communities.

### 3. Economic Insecurity of Survivors

- Women pursuing legal battles lose jobs, wages, and often incur heavy legal debts.
- Employers label them as "troublemakers," leaving them unemployable.

### 4. Weak Access to Legal Aid

- Though free legal aid exists under Article 39A and Legal Services Authorities Act, inadequate funding and lack of awareness make it inaccessible.
- Survivors often face procedural delays, exhausting resources and morale.

### 5. Retaliatory Stigma and Isolation

- Communities stigmatise survivors, questioning their morality rather than supporting their courage.
- This often leads to mental health breakdowns, social alienation, and re-victimisation.

## Consequences of Half-Empowerment

### 1. Justice Without Rehabilitation

- Legal victories remain hollow when survivors are forced back into hostile environments without financial or psychological support.

### 2. Underreporting of Crimes

- When women see survivors punished socially for speaking out, many remain silent, perpetuating cycles of abuse.

### 3. Perpetuation of Power Imbalances

- Powerful perpetrators exploit legal loopholes, delay tactics, and social pressure to silence victims.

### 4. Weak Trust in Governance

- Empowerment slogans lose credibility when state support ends after the verdict.
- This erodes trust in justice institutions.

## India's Role in Combating Gender Injustice

### 1. Legal Frameworks

- Constitutional Provisions: Articles 14, 15, 21, and 39A guarantee equality and protection.
- Laws: POSH Act (2013), Domestic Violence Act (2005), Criminal Law Amendments (2013 & 2018).
- Judicial Precedents: Vishaka Guidelines, Nirbhaya Case reforms.

### 2. Government Schemes

- Beti Bachao Beti Padhao (2015): Awareness and education for girls.

- Nirbhaya Fund (2013): Dedicated fund for women's safety projects.
- Mission Shakti (2022): Umbrella scheme for women's empowerment (Sambal + Samarthya sub-schemes).
- Support to Training and Employment Programme (STEP): Economic empowerment through skills.

### 3. Limitations

- Most schemes focus on prevention and awareness, not rehabilitation and survivor reintegration.
- Lack of convergence between central, state, and corporate CSR initiatives.

## Way Forward for True Empowerment

### 1. Survivor Compensation Schemes

- State-funded financial packages covering legal expenses, rehabilitation costs, and livelihood security.
- Similar to compensation given for victims of terrorism or industrial accidents.

### 2. Dedicated Legal Aid Cells

- Create specialised survivor litigation centres staffed with advocates, forensic experts, and counsellors.
- Fund them on par with public prosecutors in high-profile cases.

### 3. Guaranteed Employment Pathways

- Direct quotas for survivors in government, PSUs, and corporate CSR policies.
- Example: Similar to how states provide jobs to kin of martyrs.

### 4. Psychological and Trauma Support

- Institutionalise long-term counselling, therapy sessions, and peer support groups.
- Recognise trauma recovery as a basic right, not a privilege.

### 5. Institutionalise Survivor Expertise

- Train survivors as mentors, police counsellors, and ICC (Internal Complaints Committee) members under POSH Act.
- Their lived experience can improve empathy and credibility in grievance redressal.

## Conclusion

Empowerment is not magazine covers or awards — it is about structural justice. Women who resist entrenched power are performing public service, strengthening jurisprudence and democracy. Society owes them more than applause: it owes them economic security, psychosocial support, and institutionalised recognition. Only when survivor courage translates into sustainable life opportunities can empowerment be said to be delivered, not just declared.

# Toda Tribe – Preserving India's Endangered Languages

## Context:

The Toda tribe of the Nilgiri Hills is leading preservation efforts for India's endangered languages under the Scheme for Protection and Preservation of Endangered Languages (SPPEL).

## About Toda Tribe – Preserving India's Endangered Languages:

### What it is?

- A pastoral tribal community of the Nilgiris, Tamil Nadu, speaking the Toda language — a proto-South-Dravidian tongue without a native script.
- Engaged with SPPEL (CIIL, Ministry of Education) to document, digitise, and promote literacy in Toda using the Tamil script.

### Features:

- Cultural Preservation – Oral traditions, songs, and folklore integrated with linguistic material.

- Digital Tools – Use of high-end recording, linguistic software, and the Sanchika online repository for public access.
- Educational Integration – Toda primers for children, trilingual dictionaries, and multilingual literacy promotion.

### Significance:

- Cultural Identity – Protects intangible heritage and traditional ecological knowledge.
- Linguistic Diversity – Strengthens India's status as a multilingual nation with over 1,300 recorded languages.

## Nasha Mukt Bharat Abhiyaan (NMBA)

### Context:

The Nasha Mukt Bharat Abhiyaan (NMBA) has completed five years since its launch in 2020, with a special anniversary event scheduled in New Delhi.


### About Nasha Mukt Bharat Abhiyaan (NMBA):

### What it is?

- A nationwide anti-drug initiative aimed at reducing substance abuse through prevention, awareness, treatment, and rehabilitation, focusing on India's most vulnerable districts.

### Launched in: 15 August 2020

- Organisation: Ministry of Social Justice & Empowerment (MoSJE).

### Objectives:

- Curb Drug Demand: Reduce substance use through prevention, education, and outreach.
- Strengthen Community Response: Involve youth, women, and local institutions in anti-drug campaigns.
- Rehabilitation & Treatment: Ensure timely support for victims of addiction.

### Key Features:

- Targeted Districts: Implementation in 272 high-risk districts identified via national surveys and NCB data.
- Three-Pronged Approach: Supply reduction (NCB), demand reduction (MoSJE outreach), and treatment (Health Department).
- Community-Based Implementation: District and state-level committees headed by senior officials.
- Technology Integration: NMBA app, website, and active social media campaigns for outreach.
- Mass Mobilisation: Partnerships with organisations like Art of Living, Brahma Kumaris, and ISKCON for public awareness.

### Significance:

- Public Health Impact: Sensitised over 18 crore citizens, including youth and women.
- Capacity Building: Trained 20,000+ Master Volunteers nationwide.
- Social Stability: Reduced drug-related crime and strengthened social fabric.

## Scheme for Women Cooperative

### Context:

The National Cooperative Development Corporation (NCDC) has launched and is actively implementing Swayamshakti Sahakar Yojna and Nandini Sahakar to promote financial inclusion and entrepreneurship among women-led cooperatives.

## About Schemes for Women Cooperatives:

### 1. Swayamshakti Sahakar Yojna:

- Aim: To provide affordable and accessible credit to women-led Self-Help Groups (SHGs) and cooperatives for collective socio-economic activities and sustainable livelihoods.

### Features:

- Targets PACS, DCCBs, StCBs, and SHG federated cooperatives.
- Enables women SHGs to access low-cost financial services for livelihood generation.
- Promotes financial inclusion and self-reliance in rural economies.

### 2. Nandini Sahakar:

- Aim: To offer a holistic support system including financial aid, capacity building, and business model development for women cooperatives.

### Features:

- Excludes urban housing but includes all other economic sectors.
- Focus on entrepreneurial training, business planning, and interest subvention.
- Promotes women-led cooperatives under the vision of Atmanirbhar Bharat.

## 1. Freedom to Innovate

### Historical & Civilisational Roots

Human progress has always been anchored in innovation from stone tools to artificial intelligence and space exploration.

- India's civilisational ethos reflects a strong knowledge tradition, with contributions by Aryabhata, Bhaskara, Pingala, and institutions like Nalanda and Vikramshila in mathematics, astronomy, medicine, metallurgy, Ayurveda, and linguistics.
- Despite invasions and colonial rule, India's scientific and cultural innovation endured, showcasing resilience and continuity.

### Constitutional Ethos & Freedom to Innovate

Modern freedom extends beyond political sovereignty to include the ability to create, solve, and innovate. The Freedom to Innovate represents converting indigenous wisdom into global relevance. It is constitutionally anchored in:

- Art. 14 – Equality of opportunity
- Art. 21 – Right to life & dignity
- Art. 21A – Right to education
- Art. 51A(h) – Duty to develop scientific temper

### Governmental Push for Innovation

### Policy & Budgetary Boost

- Union Budget 2025–26: 20,000 cr for R&D (AI, quantum, biotech, clean energy, semiconductors).
- Deep-Tech Fund of Funds (SIDBI): 10,000 cr.
- 10,000 PM Research Fellowships ( 70–80k/month).
- Innovation reframed as a national imperative, not a privilege.

### Institutional Reforms

- ANRF (2023): Replaces SERB; 50,000 cr corpus (2023–28).
- RDI Scheme (2025): 1 lakh cr long-term, low-interest financing for private-sector R&D.
- Regulatory Ease: Procurement autonomy, trust-based governance.

### Grassroots Innovation

- National Innovation Foundation (NIF): 1400+ patents, 120+ tech transfers; grassroots/student innovators (some won Padma Shri).
- Unnat Bharat Abhiyan (UBA): Links universities with villages to design contextual tech solutions.

### Digital Public Infrastructure (DPI)

- Platforms: Aadhaar, UPI, DigiLocker, ONDC drivers of inclusive innovation.
- ONDC: 7 lakh+ sellers, 20 cr+ transactions (2025); empowers MSMEs.
- India Energy Stack (IES): UPI-like system for renewable energy, benefits farmers & DISCOMs.

### Sectoral Innovation Push

### Health:

- Ayushman Bharat Digital Mission (ABDM): 70 cr ABHA IDs, digital health ecosystem.
- PRIP: 5000 cr for pharma & MedTech R&D.
- ICMR Action Plan (2024–29): Promotes indigenous & affordable health tech.

### Agriculture 4.0:

- Drone Didi, Akashdoot, Agri-startups, Hackathons, ARYA, RKVY-RAFTAAR.
- Focus on precision farming, AI, IoT, drones.

### Deep Tech:

- NM-ICPS, NQM, Atal Innovation Labs in Tier-II/III areas.
- Focus on AI, quantum, cyber-physical systems.

### Global Impact & Achievements

- Global Innovation Index 2024: Rank 39.
- Patent filings (WIPO 2023): 6th globally.
- Network Readiness Index: 89 (2015) 49 (2024).
- Startup Ecosystem: 1.57 lakh DPIIT-recognised startups, 100+ unicorns, 51% from Tier-II/III cities.

### Civilisational Shift

- Innovation radiating from grassroots to ISRO labs "oceanic circles of change."
- Jan Bhagidari (people's participation) + Srijan (creative expression) as pillars.
- Driving Aatmanirbharta & vision of Viksit Bharat @ 2047.

## 2. India's War Against Terrorism

Terrorism remains one of the gravest national security challenges for India, particularly cross-border terrorism from Pakistan.

- The April 2025 Baisaran Valley attack in J&K once again underlined the persistence of this threat.
- Over time, India's CT approach has evolved from restraint & dialogue to a comprehensive, multidimensional strategy blending military firmness, institutional reforms, financial intelligence, and proactive diplomacy.

### Shifts in Counter-Terrorism Doctrine

- Earlier approach: Restraint, bilateral talks, international pressure.
- Current doctrine: Pre-emption & proactiveness.

### Policy assertion (PM, May 2025):

- Terrorist attack = "act of war".
- No distinction between terrorists and their ecosystem.
- Pakistan's plausible deniability unacceptable.

### Military Response & Rules of Engagement

- Operation Sindoor (2025) deep strikes on terror camps in Pakistan & PoJK.

### Precedents:

- Surgical Strikes (2016) – Uri.
- Balakot Airstrikes (2019) – Pulwama.
- Hot Pursuit (2015) – Myanmar.
- Key features: Precision targeting, minimised collateral damage, neutralising Pakistan's nuclear blackmail.
- Pressure tactic: Suspension of Indus Waters Treaty "Blood & Water cannot flow together".

### Institutional Reforms in CT Architecture

- Post-2008 Mumbai Attacks structural strengthening.
- MAC – intelligence-sharing hub.
- NIA (2009) – apex CT agency; 2019 Amendment: cyber-terror, human trafficking, counterfeit currency, extraterritorial jurisdiction.
- NATGRID – real-time data integration.

### FIU-IND & PMLA (2002, amended 2009, 2023):

- Tracking terror financing, crypto regulation, NGO monitoring.
- NIA's TF-FC Cell crackdown on J&K terror-funding networks.

- Counter-Insurgency in Jammu & Kashmir

### Curbing infiltration:

- 3-tier counter-infiltration grid, fencing along LoC/IB, drones, NVGs, thermal imagers.
- Local recruitment: Fall in militant ranks; rise of "hybrid" terrorists & proxy groups (TRF, PAFF).
- Narco-terrorism: Drug revenues linked to militancy (26 cases in 2022–23, LeT major beneficiary).
- Asset seizures: Properties of smugglers/confiscated.
- Impact: Drop in violence, but sporadic high-profile attacks (e.g., Pahalgam 2025).

### Countering Radicalisation

- Challenges: Victimhood narratives, social media propaganda, peer influence.
- Emerging trend: Lone-wolf/self-radicalised attacks (Udaipur, Amravati 2022).

### Response:

- NIA arrests, online monitoring, deradicalisation programs.
- Need: Stronger community engagement, education reforms, digital literacy.

### Diplomatic & Global Partnerships

- Multilateral engagement: FATF, G20, UNSC CT Committee, INTERPOL, "No Money for Terror" conference.
- Focus areas: crypto-financing, drones, cyber-terror.

### Bilateral cooperation:

- Extradition of Tahawwur Rana (26/11 accused).
- India–Bangladesh, India–Nepal crackdown on recruitment & infiltration.
- Limitation: No global consensus on definition of terrorism; India's CCIT (1996) remains pending.

### Trends in Pakistan-Sponsored Terrorism

- Pre-2008: Mass-casualty urban attacks (Delhi 2005, Mumbai 2006, 26/11).
- 2010–2019: Attacks on security forces (Pathankot 2016, Uri 2016, Pulwama 2019).
- Post-2019: Proxy groups (TRF, PAFF) targeting minorities, civilians, security forces post-Article 370.
- Pak narrative: "False flag" claims increasingly ineffective.

### Challenges & Way Forward

- Persisting threat: Pakistan's "thousand cuts strategy".
- Evolving tactics: From urban blasts proxy groups, narco-terror, cyber-terror.
- Global challenge: Selective approach by states.

### Way Forward:

- Multi-pronged strategy: military firmness + policing reforms + financial intelligence.
- De-radicalisation: community outreach, counter-narratives, youth engagement.
- Leverage tech: drones, AI, cyber-forensics.
- Diplomacy: push for CCIT, FATF scrutiny of Pakistan.
- Societal resilience: deny terrorism its psychological impact.

### Conclusion

India's CT doctrine has moved from defensive restraint to assertive deterrence. By combining military precision strikes, institutional strengthening, financial crackdown, proactive diplomacy, and grassroots resilience, India is building a comprehensive counter-terrorism architecture capable of deterring both terrorists and their state sponsors.

## 3. Freedom of Good Health

Health is not merely the absence of illness but a matter of dignity, equity, and empowerment. India's flagship programme, Ayushman Bharat, operationalises this vision of Universal Health Coverage (UHC) through 4 complementary pillars.

## Four Pillars of Ayushman Bharat

### 1. PM-JAY (2018):

- World's largest publicly funded health assurance scheme.
- Provides 5 lakh/year per family for secondary & tertiary care.
- Achievements: 9 crore hospital admissions; 41 crore Ayushman cards issued.
- Network: Pan-India portability; empanelled 32,000+ hospitals (46% private).
- Equity: Women ~50% beneficiaries; transgender coverage (2023).

### 2. Ayushman Arogya Mandir (AAM):

- Revamped Health & Wellness Centres for comprehensive primary care.
- Cover NCDs, palliative care, free medicines, diagnostics, mental health.
- By 2025: ~1.7 lakh AAMs decentralising healthcare.

### 3. Ayushman Bharat Digital Mission (ABDM 2020):

- Digital backbone of healthcare; ensures secure and portable health data.

### Key features:

- ABHA (14-digit Health ID).
- HPR – registry of professionals.
- HFR – national database of facilities.
- Innovations: Consent-based Health Information Exchange, Unified Health Interface (UHI) for telemedicine.
- Progress: 61+ crore records linked, >54,000 facilities onboarded.

### 4. PM-ABHIM (2021):

- 64,000 crore infrastructure mission.
- Upgrades critical care blocks, labs, surveillance systems, emergency response.
- Enhances pandemic preparedness and frontline delivery.

### Impact

- Financial protection: Reduces out-of-pocket expenditure (currently ~48% of total health spending, among highest globally).
- Equity: Benefits poor, migrants, women, transgender persons.
- Continuity of care: Seamless links across primary secondary tertiary digital care.
- Scale: World's largest coverage, decentralised to village-level centres.
- Trust-building: Health seen as right of citizenship, not privilege.

### Synergy of the Four Pillars

- PM-JAY = Affordability & dignity.
- ABDM = Portability & choice.
- AAMs + PM-ABHIM = Infrastructure & resilience.
- Together create a "One Health Ecosystem" that is preventive, promotive, curative, and participatory.

### Data & Reports:

- India spends ~2% of GDP on healthcare (Economic Survey 2022-23), below OECD average of ~9%.
- Out-of-pocket expenditure (OOPE): reduced from 62% (2014) 48% (2022) due to PM-JAY.
- NITI Aayog (2021): "Health Insurance for India's Missing Middle" report highlighted PM-JAY as a critical step but urged inclusion of uncovered middle-class groups.
- Lancet Report (2023): India's progress on UHC improved, but regional disparities remain.

### Comparative Perspective:

- UK's NHS: Tax-funded, universal free access.
- Thailand's Universal Coverage Scheme: Reduced catastrophic expenditure significantly.
- India's model: Hybrid (public funding + private empanelment + digital backbone).

### Conclusion

Ayushman Bharat is not just healthcare reform—it represents freedom from vulnerability and inequity, making health a pillar of inclusive development and Viksit Bharat @2047.

## 4. Empowering the Farmers

Agriculture, the backbone of India's economy, contributes 18% to GVA and employs 46% of the workforce. In 2024-25, it achieved record outputs with 354 MT foodgrains (+6.5%), 426 LMT oilseeds (+7.4%), and horticulture surpassing foodgrains.

- India is now self-sufficient in rice, wheat, and pulses, and moving towards self-reliance in oilseeds, reinforcing its role in food security and livelihoods.

### Policy Shifts

- Recent policy shifts in agriculture view farmers as agri-entrepreneurs, prioritising income security over mere food security.
- A multi-pronged strategy is being pursued: enhancing productivity, reducing cost of cultivation, ensuring MSP and fair prices, promoting post-harvest value addition, diversifying towards high-value crops, and advancing climate-smart, risk-mitigated farming.

### Key Interventions

- Research & Seeds: Indian Council of Agricultural Research (ICAR)–State collaborations promote climate-resilient, biofortified, high-yielding variety (HYV) seeds under National Food Security Mission (NFSM) and National Mission on Edible Oils (NMEO).
- Credit Support: Kisan Credit Card (KCC) provides concessional loans up to Rs 3 lakh @4% interest (with interest subvention + prompt repayment incentive). Agricultural credit reached Rs 10.2 lakh crore in 2025.
- Input Subsidy, Mechanisation & Minimum Support Price (MSP): Subsidised Urea & Diammonium Phosphate (DAP); Sub-Mission on Agricultural Mechanisation and Farm Machinery Banks promote mechanisation for small farmers. MSP fixed at 1.5× cost of production (22 crops) with robust procurement to prevent distress sales.
- Infrastructure: Agriculture Infrastructure Fund (AIF) – Rs 1.5 lakh crore corpus for post-harvest infrastructure (cold storages, grading units, pack houses, ripening chambers). By May 2025, facilitated Rs 1.03 lakh crore investment across 1.09 lakh projects.
- Collectivisation & Farmer Producer Organisations (FPOs): Formation of 10,000 FPOs enabling clusterbased farming, direct market linkages, retail of seeds/fertilisers, promotion of organic farming, and value addition. Enhances bargaining power, economies of scale, and farm-gate sales.
- Digital Agriculture Mission (Agri Stack): Creation of geo-referenced plot registry, unique Farmer ID, and digital crop survey to enable targeted schemes (KCC, MSP, subsidies). Aadhaar-linked Direct Benefit Transfer (DBT) ensures transparency.
- Seed Quality Assurance: SATHI (Seed Authentication, Traceability, and Holistic Inventory) Portal provides end-to-end traceability (from breeder to farmer), ensuring protection against spurious seeds.
- Technology Adoption: Use of Artificial Intelligence (AI), precision farming, remote sensing, and digital advisory systems for sowing, pest control, weather forecasting, and marketing boosting productivity and efficiency.

### Overall Impact

- Shift from food self-sufficiency farmer income security.
- Strong focus on productivity, digital empowerment, post-harvest value addition, and sustainability.
- FPOs + DPI + MSP + infra creation = agricultural transformation.
- Lays foundation for Atmanirbhar Krishi and farmer empowerment.

## 1. Rising in Unison: Realizing Sahkar SE Samriddhi

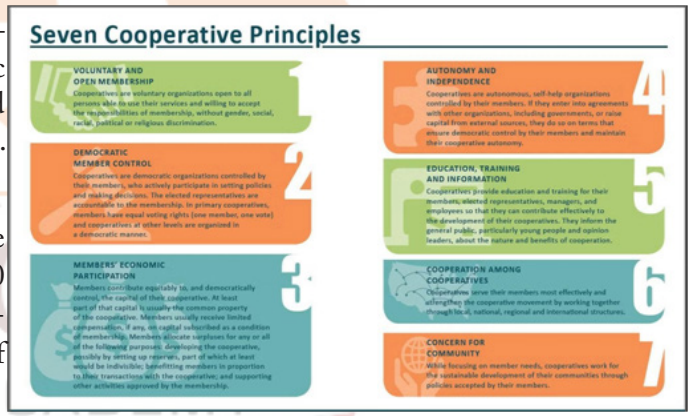
Cooperation, based on 'Sah' (together) and 'Karya' (action), holds transformative potential for communityled growth. As India targets a $5 trillion economy, cooperatives must be repositioned as democratic, multisectoral business entities. The vision of "Sahkar Se Samriddhi" demands unified, time-bound efforts for inclusive socio-economic development.

### Philosophical Roots and Historical Evolution

- India's ancient texts—Rigveda, Manusmriti, and Arthashastra—emphasize collective trusteeship. The Rigveda advocates unity: "May we be of one mind…". Arthashastra mandates shared responsibility in cooperatives.
- The Cooperative Credit Societies Act, 1904 formalized grassroots economic cooperation. Mahatma Gandhi called Charkha the "greatest voluntary cooperation," linking it to self-reliance and rural empowerment.


### Cooperative Values and Principles

Indian cooperatives function on 7 global principles—voluntary membership, democratic control, economic participation, autonomy, education, inter-cooperation, and community focus. These foster people-centric development.




### Status of the Cooperative Movement

- India has 814,575 cooperatives with 29 crore members, covering 98% of villages. Over 810,000 are Primary Cooperatives, and 19 are national-level federations, making this a critical pillar of India's economy.

### PACS: Strengthening Rural Cooperatives

Primary Agricultural Credit Societies (PACS) in 32 States/UTs can now conduct 25+ business activities, including: Fisheries, Dairy, Warehousing, Banking, Insurance, Legal Services, Renewable Energy Initiatives, PM Bhartiya Janaushadhi Kendras (PMBJKs), Common Service Centres (42,080 PACS, 300+ e-services) and Fertilizer & Panchayat-level Maintenance Services

Additional Initiatives: As part of the ongoing cooperative sector reforms, 7.43 lakh RuPay Kisan Credit Cards (KCCs) have been distributed under the Gujarat pilot, 716 Primary Agricultural Credit Societies (PACS) are now functioning as Pradhan Mantri Bhartiya Janaushadhi Kendras (PMBJKs), 36,193 PACS have been converted into Kisan Samriddhi Kendras, and 286 PACS have applied for Oil/LPG dealership, further strengthening rural service delivery and financial inclusion.

### Cooperatives Driving Atmanirbhar Bharat

### To reduce pulse and maize imports, GoI launched:

- e-Samyukti portal (NCCF): 12.64 lakh farmer registrations
- e-Samridhi portal (NAFED): 6.75 lakh registrations
- These portals ensure MSP procurement, boost income security, and promote ethanol production under the Ethanol Blending Programme.

## Promoting Cooperative FPOs and FFPOs

**Strategic integration of Farmer Producer Organizations (FPOs) and Fishery Farmers Producer Organizations (FFPOs) within the cooperative framework has enhanced income diversification and rural entrepreneurial capacities. The National Cooperative Development Corporation (NCDC) has successfully formed:**

- 730 cooperative FPOs
- 70 FFPOs (initial phase)

## Expansion into Oil and Energy Sector

**PACS are now eligible for:**

- Retail Petrol/Diesel and LPG Dealerships
- Participation in MNRE renewable energy schemes
- Promotion of solar pumps and PV modules on farms

## Strengthening the Cooperative Credit Structure

**With 13 crore farmers linked to PACS, GoI is modernizing the 3-tier credit system:**

- StCB DCCB PACS
- Focus on computerizing ARDBs, SCARDBs, and PCARDBs
- Strengthening DCCBs (middle tier) to ensure credit efficiency

## Cooperative Education and Skill Building

- The establishment of Tribhuvan Sahkari University institutionalizes cooperative learning, promoting leadership, professionalism, and sustainability in the sector.


## Conclusion

As India moves toward Viksit Bharat@2047, the cooperative movement is key to achieving inclusive and equitable development. The vision of "Sahkar Se Samriddhi" is a national call-to-action for grassroots entrepreneurship, self-reliance, and social equity.

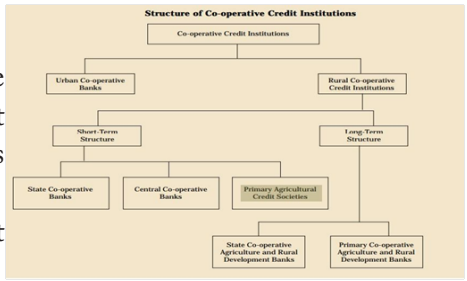
Strengthening cooperative institutions, enabling multi-sectoral participation, and aligning them with national missions can turn cooperatives into engines of prosperity—ensuring that growth reaches the last mile through the spirit of collective action.

# 2. PACS as Common Service Centers (CSCS)

Rural India has long relied on Primary Agricultural Credit Societies (PACS) as the backbone of its agricultural credit system. With over 1 lakh PACS spread across the country and catering to more than 13 crore farmer members, these institutions form one of the largest cooperative networks globally.

- Traditionally, their role has been limited to providing short-term and medium-term credit to farmers. However, the evolving needs of rural India—spanning digital inclusion, e-governance, financial literacy, and access to basic services—necessitate a broader institutional transformation.
- In this context, the integration of PACS into the Common Service Centers (CSC) framework represents a pivotal policy shift toward inclusive, digitally-enabled rural development.

## What are PACS?




- Definition: PACS are the lowest tier in the short-term cooperative credit structure (comprising PACS at the village level, District Central Cooperative Banks (DCCBs), and State Cooperative Banks (StCBs)).
- Role: They offer agricultural credit, fertilizers, seeds, and procurement services.
- Structure: Registered under respective State Cooperative Societies Acts, PACS operate as memberdriven institutions, democratically governed and financially supported by cooperative banks and NABARD.

- Challenges: Manual record-keeping, limited diversification, lack of digitization, and poor governance hampered their efficiency.

## PACS-CSC Integration: A Policy Shift

Recognizing their deep rural penetration, the Government signed an MoU on 2nd February 2023 between the Ministry of Cooperation, Ministry of Electronics & IT, NABARD, and CSC e-Governance Services India Ltd to integrate PACS into the Digital Seva Portal of CSCs.

This initiative transforms PACS into one-stop service hubs, offering 300+ e-services, such as:

- Banking, insurance & digital payments
- Aadhaar updation, PAN card & passport services
- Rail, bus, and air ticket bookings
- Health services (e.g., telemedicine, diagnostics)
- e-Commerce access for both purchasing and marketing rural produce
- Legal literacy & investor awareness
- Government scheme enrollments (e.g., DBT, welfare registrations)
- Online education, skilling & vocational training

## Advantages of the Transformation

- Empowering Farmers Beyond Credit: The transformation reduces dependence on intermediaries by facilitating direct access to markets and government schemes. It promotes financial inclusion through digital banking and faster loan disbursement, while enhancing awareness and decision-making among members via targeted education and information services.
- Strengthening Governance and Efficiency: The adoption of ERP systems, cloud storage, CAS, and MIS has enabled real-time integration with higher cooperative banks, ensured transparency and financial accountability, and strengthened disaster resilience by ensuring continuity through digital infrastructure.
- Facilitating Inclusive Development: As digital service hubs, PACS-CSCs deliver welfare and e-governance services in remote areas, operate on a sustainable pay-per-use model, and foster collaborative networks across cooperatives to enable best practice exchange and capacity building.

## Case Studies of Transformation

- Maharashtra – Kharsai Vividha Karyakari Society: Transitioned from manual to digital systems, resolving issues like data inaccuracy and inefficiencies. Full-scale ERP adoption enhanced transparency, reduced workload, and improved member satisfaction—demonstrating the potential of digital modernization in rural cooperatives.
- Tamil Nadu – Arakandanallur PACS, Villupuram: Despite severe flood damage, the society ensured uninterrupted services through prior partial computerization and cloud-based data access. This highlights the resilience and disaster-readiness of digitally enabled PACS.
- Implementation Priorities: To ensure the success of the PACS-CSC transformation, it is essential to strengthen HR capacity, training, and administrative systems, focus on welfare delivery through e-PACS, and promote digital and financial literacy. Additionally, building cooperative ecosystems for innovation and best-practice sharing, along with ensuring financial sustainability through service-based revenue models, are critical for long-term impact.

## Conclusion

The computerization and integration of PACS into the CSC framework is not just a digital upgrade—it is a transformative strategy aimed at revitalizing India's rural cooperative institutions. By combining financial services with e-governance, skilling, and healthcare, PACS are being reimagined as multi-functional, community-centric institutions. This reform aligns with the vision of 'Sahkar Se Samriddhi', strengthening rural prosperity through cooperative development.

Through enhanced transparency, accountability, and service delivery, the PACS-CSC model will play a central role in building a digitally empowered, economically resilient, and inclusive rural India—in sync with the larger goals of Digital India, financial inclusion, and cooperative federalism.

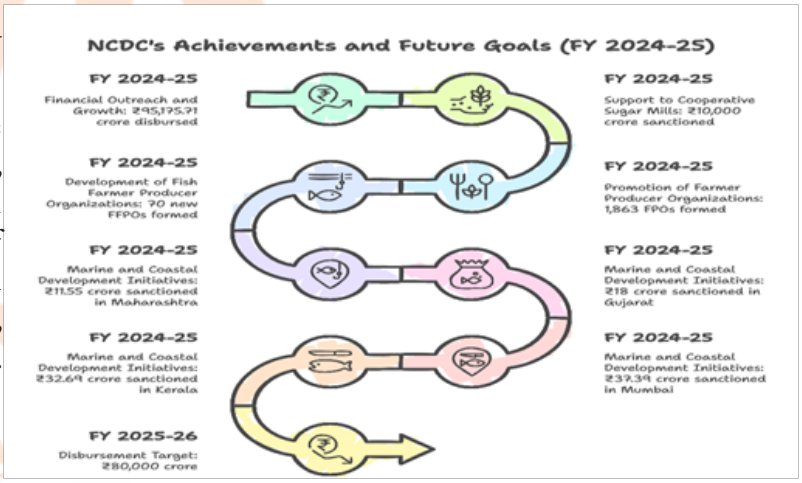
## 3. NCDC: Powering India's Cooperative Revolution

The National Cooperative Development Corporation (NCDC) has emerged as a key driver of India's cooperative resurgence, playing a pivotal role in rural transformation through support to cooperative sugar mills, Farmer Producer Organizations (FPOs), Fish Farmer Producer Organizations (FFPOs), and marine fishing cooperatives. As India pushes for inclusive economic growth, NCDC's proactive financial and technical interventions have strengthened grassroots economic institutions.

### About NCDC

- The National Cooperative Development Corporation (NCDC), a statutory body under the Ministry of Cooperation, was established in 1963 under the NCDC Act, 1962 to promote the cooperative movement and rural economic development.
- It supports farmer cooperatives by financing activities like agricultural marketing, processing, storage, cold chains, and input supply.
- NCDC also promotes non-farm cooperative sectors such as dairy, handloom, sericulture, poultry, and fisheries, with a focus on SCs, STs, and women cooperatives. It implements various Central Sector Schemes, aiming to empower cooperatives and drive inclusive and sustainable rural growth.

### Key Achievements and Highlights




- Financial Outreach and Growth: In FY 2024–25, NCDC disbursed 95,175.71 crore benefiting 2.76 lakh cooperative societies and 1.27 crore members, achieving a net profit of 750 crore with zero NPAs and a loan recovery rate of 99.76%. Cumulative disbursement till March 2025 stood at 4.08 lakh crore, marking a 33% CAGR since 2015–16. The disbursement target for FY 2025–26 is 80,000 crore.
- Support to Cooperative Sugar Mills (CSMs): A one-time grant of 1,000 crore was provided by the Ministry of Cooperation, enabling NCDC to sanction and release 10,000 crore to 56 cooperative sugar mills for ethanol production, cogeneration units, and working capital, thereby enhancing rural employment and operational viability.
- Promotion of Farmer Producer Organizations (FPOs): Under the Formation and Promotion of 10,000 FPOs Scheme, NCDC formed 1,863 FPOs, including the targeted 1,100 additional FPOs, and disbursed 165.37 crore to FPOs and Cluster-Based Business Organizations (CBBOs) to strengthen collective farming and market linkages.
- Development of Fish Farmer Producer Organizations (FFPOs): Under the Pradhan Mantri Matsya Sampada Yojana (PMMSY), NCDC formed 70 new FFPOs and converted 1,000 existing fisheries cooperatives, disbursing 77.07 crore. Under the new PM Matsya Kisan Samriddhi Sah-Yojana (PMKSSY), a target has been set to transform 2,348 fisheries cooperatives into FFPOs to boost the blue economy.
- Marine and Coastal Development Initiatives: Through the Deep-Sea Trawlers Initiative, NCDC sanctioned 11.55 crore in Maharashtra (14 trawlers) and 18 crore in Gujarat (30 trawlers). It also sanctioned 37.39 crore to Rajmata Vikas Macchimar Sahkari Sanstha, Mumbai, for a seafood processing unit, and 32.69 crore ( 20.83 crore released) for the Integrated Fisheries Development Project in Kerala to improve marine infrastructure and processing capacity.

### Significance

The NCDC plays a critical role in rural economic empowerment by enabling small farmers, fishers, and rural entrepreneurs to access affordable credit, infrastructure, and market linkages. It directly contributes to the goal of doubling farmers' income through value addition, ethanol production, and collective marketing.

- By supporting weaker sections such as SCs, STs, and women via cooperative-led models, it promotes inclusive development. NCDC also encourages sustainable practices like eco-friendly fisheries and

community resource management. Its initiatives are well-aligned with the Ministry of Cooperation's vision of "Sahkar se Samriddhi."

### Challenges and Way Forward

Despite its achievements, the cooperative sector faces regional disparities, inadequate digital infrastructure at the PACS and FPO levels, and a lack of trained cooperative leadership.

- To address these gaps, there is a need to strengthen human resources and digital systems, promote multi-purpose PACS through the Common Services Centre (CSC) model, and expand credit access to non-agricultural cooperatives. Additionally, ensuring transparency, accountability, and proper fund utilization is crucial for sustaining long-term cooperative growth.

### Conclusion

The NCDC has firmly positioned itself as a cornerstone of India's cooperative growth strategy. Its financial prudence, technical capacity, and grassroots engagement have helped it become a model public financial institution. As the cooperative sector expands into newer domains like ethanol production, digital agriculture, and blue economy, NCDC's role will remain crucial in making cooperatives vibrant, sustainable, and self-reliant.

## 4. Multi-State Cooperative Societies (Amendment) Act, 2023

The cooperative movement has played a pivotal role in India's rural and agricultural development, promoting self-reliance, collective action, and inclusive growth. Recognizing the need for reform in multi-state cooperative societies (MSCS), the Government of India enacted the Multi-State Cooperative Societies (Amendment) Act, 2023, a comprehensive legislation to improve governance, transparency, and accountability in the cooperative sector.

### Background and Rationale

- The Ministry of Cooperation, established on 6th July 2021, aims to realize the vision of "Sahkar se Samriddhi" by providing an exclusive policy, legal, and administrative framework for cooperatives.
- Widespread issues such as financial mismanagement, delayed elections, lack of transparency, and weak grievance redressal in MSCS prompted legislative intervention.
- The original MSCS Act, 2002, lacked adequate safeguards to address emerging challenges, making amendments imperative.

### Salient Features of the MSCS (Amendment) Act, 2023

- Cooperative Election Authority (CEA): Established under Section 45 to ensure timely, regular, and transparent elections in Multi-State Cooperative Societies (MSCS). As of April 2025, it has conducted 113 elections and 33 more in progress, with proactive coordination for election preparedness.
- Grievance Redressal Mechanism: Provision for Cooperative Ombudsman under Section 85A and Cooperative Information Officers (CIOs) under Section 106 to handle member grievances, ensure accountability, and improve information transparency.
- Financial Transparency and Accountability: Introduction of Concurrent Audit (Sec 70A) for societies above a defined turnover threshold to detect fraud early. Audit reports of apex MSCS to be tabled in Parliament. Central Government empowered to define auditing standards and prudential norms for thrift and credit societies.
- Ethical Governance: Mandatory Audit and Ethics Committee and POSH Committee (Prevention of Sexual Harassment) for each MSCS board. Stricter disqualification norms for directors and expulsion period extended from 1 year to 3 years (Section 30).
- Social Inclusion: Ensures mandatory representation of 1 SC/ST and 2 women members on MSCS boards in line with Article 243ZJ, promoting social justice, inclusivity, and gender equity.
- Digitization and Ease of Doing Business: Enables digital filing of applications, returns, and fees. Registration timeline reduced from 4 months to 3 months, with a 2-month extension for correcting deficiencies.
- Professional Leadership: Defines minimum eligibility criteria for appointment of Chief Executive Officers (CEOs) to ensure qualified and capable leadership.
- Enhanced Regulatory Oversight: Authorizes the Central Registrar to conduct inquiries into fraudulent or illegal activities. Updates investment norms by eliminating colonial-era instruments and adopting modern financial standards.

## Significance:


- Democratic Governance: Ensures free, fair, and timely elections in Multi-State Cooperative Societies (MSCS) through the Cooperative Election Authority (CEA).
- Transparency & Accountability: Introduces real-time audits, public disclosures, and digital filing to promote good governance.
- Inclusive Growth: Empowers Scheduled Castes (SCs), Scheduled Tribes (STs), women, and rural communities through mandatory board representation and cooperative leadership.
- Ease of Doing Business: Simplifies registration timelines, enables online submissions, and reduces compliance burdens.
- Grievance Redressal: Institutionalizes a robust Ombudsman framework and Cooperative Information Officers (CIOs) for member protection.
- Policy Alignment: Reinforces the Ministry of Cooperation's vision of "Sahkar se Samriddhi", linking cooperatives with rural empowerment and economic justice.

## Challenges

- Capacity Gaps: Need for training and upskilling of MSCS officials, CIOs, and elected board members.
- Digital Divide: Uneven digital infrastructure across regions limits access and efficiency.
- Regional Disparities: Wide gaps in cooperative penetration and performance, especially in eastern and northeastern India.

## Way Forward

- Training & Sensitization: Conduct targeted capacity-building programmes for CIOs and cooperative boards.
- Digital Expansion: Ensure last-mile digital connectivity, especially for rural and tribal cooperatives.
- CSC Model Integration: Promote multi-purpose PACS as Common Service Centres (CSCs) to offer government-to-citizen (G2C) services.
- Strengthened Oversight: Establish robust monitoring and evaluation (M&E) mechanisms for fund utilization and service delivery outcomes.

## Conclusion

The MSCS (Amendment) Act, 2023 marks a transformational step in revamping India's cooperative landscape. By embedding transparency, democratic functioning, financial prudence, and social equity, it lays a robust foundation for making cooperatives a vibrant engine of rural development and economic empowerment. For UPSC aspirants, this amendment is a critical reform in governance, rural economy, and policy execution, with far-reaching implications for inclusive growth.

EXCEL

CIVILS ACADEMY

EMPOWERING FUTURE LEADERS