EXCEL
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EMPOWERING FUTURE LEADERS

CURRENT AFFAIRS

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Director's Message

Dear Aspirants,

India is currently standing at a defining historical crossroad where its demographic composition offers a unique window of economic opportunity, yet the reality of youth employment reveals a complex and structural crisis. As the nation transitions through its demographic dividend phase, the generation representing the contemporary workforce, broadly identified as Gen Z, faces unprecedented socio-economic pressures in securing formal, stable, and dignified livelihoods. Recent labor force metrics highlight a stark paradox wherein robust macroeconomic gross domestic product expansion coexists with elevated unemployment and underemployment rates among educated youth. This misalignment poses a fundamental threat to India's aspiration of transforming into a developed economy by its centenary of independence.

The root causes of this contemporary employment friction are deeply embedded in structural anomalies within the Indian labor market and educational architecture. India's educational framework has historically prioritized rote learning and theoretical degree acquisition over applied vocational expertise, critical thinking, and industry-aligned competencies. Consequently, a massive pool of young graduates enters the job market annually with academic qualifications that fail to match the rapidly evolving demands of modern industries, advanced manufacturing, and technology-driven services. At the same time, the employment elasticity of economic growth has witnessed a secular decline over recent decades, meaning that each percentage point of gross domestic product expansion generates fewer formal jobs than it did previously. Industrial sectors, constrained by capital-intensive models or regulatory complexities, often fail to absorb the burgeoning workforce transitioning out of agriculture, resulting in a heavy reliance on informal work, contract engagements, and disguised unemployment.

Recognizing these structural hurdles, the Indian government has systematically introduced targeted policies, digital platforms, and fiscal interventions to bridge the gap between academic output and industry requirements. Structured initiatives such as national internship programs and employment-linked incentive frameworks are actively designed to offer direct financial support while facilitating formal job creation and first-time corporate

exposure. Simultaneously, the Skill India Mission, backed by the Pradhan Mantri Kaushal Vikas Yojana and the National Apprenticeship Promotion Scheme, focuses on continuous upskilling, modular training, and modernizing industrial institutes to make youth readily employable in high-growth sectors. Digital public infrastructure and platforms like the National Career Service portal and the Mera Yuva Bharat initiative further connect young individuals with localized career opportunities, digital learning, and leadership pathways, seamlessly integrating them into nation-building efforts. Furthermore, sector-specific growth pillars such as the India Semiconductor Mission, alongside credit-empowerment frameworks like the Pradhan Mantri MUDRA Yojana, deliberately tie capital expenditure and entrepreneurial support directly to local workforce development and self-reliance.

Despite these wide-ranging administrative efforts, this employment challenge carries profound socio-economic ramifications that disproportionately impact vulnerable demographics, particularly young women. While male youth encounter severe hurdles in securing formal salaried positions with social security benefits, young women face an even steeper wall of exclusion characterized by stark gender disparities in labor force participation and high burdens of unpaid domestic responsibilities. When educated young women are forced out of the active workforce due to a lack of safe, flexible, and accessible employment opportunities, the nation loses a crucial engine of inclusive growth and social modernization. Prolonged joblessness among the youth also inflicts deep psychological scars, eroding self-confidence, delaying critical life milestones, and increasing vulnerability to radicalization, substance abuse, or social unrest. Without urgent and sustained interventions, the much-touted demographic dividend risks transforming into a demographic burden, straining public resources and exacerbating wealth inequalities across urban and rural landscapes.

Addressing this multi-dimensional challenge requires an unyielding, mission-mode strategy involving comprehensive policy overhauls across education, industry, and labor governance. First and foremost, the educational ecosystem must undergo a paradigm shift toward experiential learning, modular skilling, and continuous industry partnerships, ensuring that institutional curricula reflect real-world requirements in fields ranging from green technologies to artificial intelligence applications. Second, national economic policy must consciously pivot toward employment-intensive growth by incentivizing labor-centric manufacturing clusters, micro, small, and medium enterprises, and service sectors like

tourism and digital infrastructure that possess high job-multiplier effects. Enhancing the ease of doing business at the grassroots level, expanding structured apprenticeship models, and formalizing the gig and platform economy through robust social security safety nets are equally indispensable steps. Ultimately, securing the future of India's youth is not merely an economic imperative for wealth generation, but a fundamental prerequisite for maintaining social stability, equity, and democratic resilience in the decades ahead.

Best wishes

Yours sincerely,



K Rajendra Kumar IPS (Retd)



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CIVILS ACADEMY

EMPOWERING FUTURE LEADERS

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Current Affairs

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Chapter-
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HISTORY & CULTURE

Shaheed Udham Singh

Context:

The nation observed the 87th martyrdom day of legendary revolutionary freedom fighter Shaheed Udham Singh.



Shaheed Udham Singh

About Shaheed Udham Singh:

Who He Was?

- Shaheed Udham Singh (born Sher Singh on December 26, 1899) was an iconic Indian political activist and revolutionary associated with the Ghadar Party and the Hindustan Socialist Republican Association (HSRA).
- He is revered for avenging the 1919 Jallianwala Bagh massacre by assassinating Michael O'Dwyer in London.

Early Days:

- Orphaned at a Young Age: Born in Sunam, Punjab, he lost his mother at age three and his father a few years later. He was raised alongside his elder brother at the Central Khalsa Orphanage in Amritsar, where he was renamed Udham Singh.
- Witness to Jallianwala Bagh (1919): On April 13, 1919, while serving water to peaceful protesters gathered at Jallianwala Bagh against the Rowlatt Act, he witnessed the horrific massacre ordered by Brigadier-General Reginald Dyer and approved by Punjab's Lieutenant Governor, Sir Michael O'Dwyer.
- Global Travel & Aliases: To evade British intelligence, he adopted several aliases (including Frank Brazil and Ude Singh) while traveling across Africa, Europe, Mexico, and the United States.

Contributions to the Freedom Movement:

- Ghadar Party Mobilization: Joined the international Ghadar Movement in 1924 while living in the United States, organizing Indian workers and spreading anti-colonial literature.
- Smuggling Arms to India: Returned to India in 1927 at the call of Bhagat Singh (whom he considered his guru) to smuggle weapons and seditious literature. He was arrested by British police and served five years in prison.
- Assassination of Michael O'Dwyer (1940): After tracking O'Dwyer for years, Udham Singh shot and killed him at London's Caxton Hall on March 13, 1940, during a joint meeting of the East India Association and the Royal Central Asian Society.

Last Days and Execution:

- Symbolic Identity ('Ram Mohammad Singh Azad'): While in British custody, he signed his name as Ram Mohammad Singh Azad—a unifying moniker combining symbols of Hinduism, Islam, and Sikhism, with Azad representing a free India.
- Trial & Hunger Strike: Held at Brixton Prison, he underwent a 42-day hunger strike during his trial at the Central Criminal Court, proudly declaring he was unconcerned by the prospect of death in the cause of national freedom.
- Execution & Legacy: He was hanged at London's Pentonville Prison on July 31, 1940. In 1974, through the efforts of Punjab Chief Minister Giani Zail Singh, his mortal remains were brought back to India and cremated with full national honors at Sunam.

Batukeshwar Dutt

Context:



Union Home Minister paid national tributes to the iconic Indian revolutionary freedom fighter Batukeshwar Dutt on his death anniversary.

Batukeshwar Dutt

About Batukeshwar Dutt:

Who He Was?

- Batukeshwar Dutt (also known as B.K. Dutt, Battu, or Mohan) was a prominent Indian socialist revolutionary. He is best known for executing the symbolic Central Legislative Assembly bombing in New Delhi alongside Bhagat Singh in 1929 to make the deaf hear against oppressive colonial legislation.

Early Days and Radicalization:

- Birth & Roots: Born on November 18, 1910, in Oari village, Purba Bardhaman district, West Bengal.
- Formative Years in Kanpur: He spent much of his youth and completed his schooling at P.P.N. High School in Kanpur, Uttar Pradesh.
- Meeting Bhagat Singh: In 1924, Dutt met Bhagat Singh in Kanpur. Under the mentorship of revolutionaries like Chandrashekhar Azad, he joined the revolutionary underground movement and mastered the art of bomb-making.

Key Contributions to the Freedom Movement:

The Central Assembly Bombing (April 8, 1929):

- Protest Against Colonial Bills: The British government introduced two anti-Indian measures—the Public Safety Bill and the Trade Disputes Bill—to suppress labor movements and revolutionaries.
- The Action: On April 8, 1929, Dutt and Bhagat Singh entered the visitor's gallery of the Central Assembly in Delhi. They threw two low-intensity, non-lethal bombs onto vacant areas of the floor, scattered anti-imperialist leaflets, and raised the historic slogan Inquilab Zindabad! (Long Live the Revolution!).
- Voluntary Arrest: Refusing to flee, they courted arrest to use the British courtrooms as a public platform to spread their revolutionary message across India.
- Historic Hunger Strike for Political Prisoners:Following their arrest and sentence of life imprisonment, Dutt and Bhagat Singh launched an unprecedented hunger strike in jail. They protested against the abusive treatment of Indian prisoners compared to European inmates, ultimately forcing the British administration to grant fundamental rights and improved standards for political prisoners.
- Sentence andCellular Jail Hardships: Sentenced to transportation for life (Kalapani) in 1929, Dutt was deported to the Cellular Jail in the Andaman Islands. He endured years of brutal forced labor and participated in major prison hunger strikes in 1933 and 1937.
- Quit India Movement (1942):After contracting tuberculosis in jail, he was released in 1938. Unwavering in his commitment, he joined Mahatma Gandhi's Quit India Movement in 1942 and was imprisoned for another four years in Motihari Jail, Bihar.

Revolutionary Associations:

- Hindustan Socialist Republican Association (HSRA): A core member of this party, working alongside Bhagat Singh, Chandrashekhar Azad, and Sukhdev.
- Naujawan Bharat Sabha: Active in the youth wing formed to mobilize workers and students against colonial rule.

Last Days and Passing:

- Post-Independence Hardships: After 1947, Batukeshwar Dutt lived quietly in Patna, Bihar, with his family. Despite his sacrifices, he faced severe economic hardship and public neglect.
- Final Illness and Passing: In the 1960s, he developed bone cancer. He was brought to AIIMS Delhi for treatment, where he passed away on July 20, 1965, at the age of 54.

- Last Wish fulfilled: In accordance with his final request, he was cremated at Hussainiwala (Firozpur, Punjab), right beside his comrades Bhagat Singh, Rajguru, and Sukhdev.

The Ravidassia Community

Context:



Thousands of Ravidassia community members gathered in Phagwara, Punjab, renewing their demand for recognition of Ravidassia as a separate religion in the upcoming Census.

The Ravidassia Community

About The Ravidassia Community:

Who They Are?

- The Ravidassias are a distinct socio-religious Dalit community who follow the spiritual teachings, egalitarian philosophy, and mystic poetry of Guru Ravidas, a highly revered 15th-to-16th century saint of the Bhakti Movement.

Habitat and Demographics:

- Primary Concentration: The bulk of the community—comprising nearly 12 lakh individuals—resides in the Doaba region of Punjab, which spans the districts of Jalandhar, Hoshiarpur, Kapurthala, and Nawanshahr.
- Broader Footprint: Combined with the allied Ad Dharmi movement, the community stands at over 30.95 lakh members, representing more than 11% of Punjab's entire population and forming a major chunk of the state's 32% Dalit demographic.

History and the 2009 Turning Point:

- Dera Sachkhand Ballan: Founded by Baba Sant Pipal Das, it emerged as the principal institutional and spiritual centre of the Ravidassia community.
- Vienna Attack, 2009: An armed attack on a Ravidassia congregation in Vienna killed Sant Ramanand and injured several devotees, triggering widespread protests in Punjab.
- Declaration of Separate Faith: In 2010, Dera Sachkhand Ballan formally declared the Ravidassia panth a separate faith, consolidating its independent religious identity.

Key Features of the Ravidassia Faith:

- Sovereign Scripture — Amritbani: The Amritbani Guru Ravidas Ji, containing 200 hymns attributed to Guru Ravidas, serves as the community's distinctive sacred text.
- Concept of Begampura: Guru Ravidas envisioned Begampura, or the city without sorrow, as a caste-free and egalitarian society without exploitation, fear or discrimination.
- Independent Worship and Symbols: The community maintains distinct places of worship, religious greetings and sacred symbols, including the 'Har' insignia.
- Major Pilgrimage Centre: Seer Goverdhanpur in Varanasi, the birthplace of Guru Ravidas, is the community's major pilgrimage destination, attracting lakhs of devotees annually.

Significance:

- A separate Census category could provide accurate demographic data, prevent administrative misclassification and formally recognise the community's distinct religious identity.
- With substantial electoral influence in the Doaba region, the Ravidassia community plays an important role in Punjab politics and broader debates over Dalit representation and identity.

The Thukkachi Temple

Context:



The 12th-century Abathsahayeswarar Temple at Thukkachi received global recognition after being conferred the prestigious UNESCO Asia-Pacific Award of Distinction (2024) for outstanding heritage conservation.

The Thukkachi Temple

About The Thukkachi Temple:

What It Is?

- The Abathsahayeswarar Temple is a historic 12th-century Hindu shrine that stands as a remarkable testament to the architectural brilliance of the later Chola period. It is designated as a living historic temple, meaning it continues to function as an active house of worship while being preserved as a protected heritage monument.

Location: Situated in the Thanjavur district of Tamil Nadu, India.

History:

- Royal Foundations: The temple is closely associated with the later Chola emperors Kulottunga I and his son Vikrama Chola. Kulottunga I initially endowed the shrine specifically for the daily recitation of sacred Thevaram hymns.
- The Vikrama Chola Connection: It holds unique historical significance as perhaps the only major temple built entirely during the reign of Vikrama Chola, who expanded and renovated the earlier structure.
- Epigraphical Epithalamium: Historical inscriptions found on the temple walls refer to Thukkachi as Thenthirukalathi or Vikramacholeeswaram.

Key Architectural and Structural Characteristics:

- Unique Chariot Design (Kara Kovil): The temple is structurally conceived and designed as a Kara Kovil—a rare architectural style in Tamil history where the temple sanctuary is built in the physical shape of a processional chariot.
- Oldest LordSarabeshwarar Depiction: The complex houses a highly revered idol of Lord Sarabeshwarar, which is widely considered by historians to be one of the absolute oldest stone iconographic representations of this specific deity in existence.
- Precision Digital Anastylosis: The restoration used drone surveys and digital mapping to catalog the structure. Every single shifting granite block was individually numbered before being dismantled and later reassembled into its precise, original position.
- Interdisciplinary Sthapatya Veda Framework: The conservation combined traditional temple-building knowledge (Sthapatya Veda) and Agama Shastra rules with modern conservation engineering, utilizing traditional sthapathis alongside contemporary structural engineers.

Significance:

- The 5-crore Thukkachi restoration became a successful pilot, with its conservation methods incorporated into Tamil Nadu's official Manual for Temple Restoration and Conservation.
- Local residents contributed funds and received conservation training, creating a sustainable model of community ownership and long-term heritage guardianship recognised by UNESCO.

The Māori Tribe

Context:



During his historic state visit to Auckland, Prime Minister of India addressed the Indian diaspora and highlighted the Māori cultural concept of 'Waka' to symbolize the shared journey, friendship, and values defining India-New Zealand relations.

The Māori Tribe

About The Māori Tribe:

What It Is?

- The Māori are the indigenous Polynesian people of mainland New Zealand (Aotearoa). Arriving in waves of canoe voyages between 1200 and 1300 CE, they developed a distinct, rich culture rooted in tribal lineage, a deep spiritual connection to the land, and a robust oral history.

Habitat and Region Found In:

- Primary Distribution: Concentrated across New Zealand, predominantly on the North Island, where the subtropic-to-temperate climate historically supported agriculture and fishing.
- Ecosystem: Settled across coastal inlets, river terraces, and fertile volcanic valleys, leveraging the local waters for navigation and the dense forests for timber and wildlife.

Key Characteristics:

Social and Tribal Structure:

- Whakapapa (Genealogy): The foundation of Māori identity, tracing ancestry to original canoe settlers and determining inheritance, social status, and traditional land rights.
- Iwi and Hapū: Māori society is organised into Iwi (tribes) and smaller Hapū (sub-tribes) that traditionally cooperate in defence, resource management, and community affairs.
- The Marae: A sacred communal complex centred around the Wharenui (meeting house), hosting ceremonies, tribal discussions, funerals, welcomes, and cultural gatherings.

Physical and Artistic Traditions:

- Tā Moko (Sacred Tattooing): Traditional Māori tattooing uses intricate patterns, historically carved into the skin, to represent ancestry, tribal identity, social status, and achievements.
- Wood and Pounamu Carving: Māori artisans create elaborate carvings on houses and canoes and shape Pounamu (greenstone) into weapons, tools, ornaments, and treasured heirlooms.

Performative Arts and Protocol:

- The Haka: A powerful ceremonial posture dance involving rhythmic chanting and vigorous movements, traditionally linked to warfare but now used for welcomes, celebrations, and commemorations.
- The Hongi Greeting: A traditional greeting involving the touching of noses and foreheads, symbolising the sharing of the breath of life (te ha) and mutual acceptance.

About the Waka:

What It Is?

- A Waka is a traditional Māori canoe that also symbolises shared identity, collective responsibility, and a community's common journey towards a unified goal.

Key Technical and Cultural Features

- Diverse Technical Classes: Traditionally crafted from large native tree trunks, Waka existed in different forms for warfare, transport, fishing, and inland navigation.
- Waka Taua: Large, elaborately carved war canoes capable of carrying dozens of warriors.
- Waka Tētē: Medium-sized utility canoes used for fishing, transporting families, and carrying goods.
- Waka Kōrari: Lightweight vessels made from flax stalks for navigating rivers and inland waterways.
- Advanced Ocean Voyaging: Māori ancestors crossed vast Pacific distances in large voyaging canoes, navigating through stars, ocean swells, winds, and bird movements.
- Deep Cultural Identity: Māori communities often trace their ancestry to particular ancestral Waka, linking tribal identity, genealogy, historical migration, and traditional territorial associations.

Prambanan Temple

Context:

Prime Minister of India and Indonesian President Prabowo Subianto officially launched an international conservation and restoration project at the Prambanan Temple Compounds in Yogyakarta, Indonesia.



Prambanan Temple

AboutPrambanan Temple:

What It Is?

- Prambanan (locally known as Roro Jonggrang or Loro Jonggrang) is the largest and most architecturally complex Hindu temple compound in Indonesia, and one of the largest in Southeast Asia.
- It stands as a towering masterpiece of classical Shaivite art, design, and stone-building technology, representing the grand peak of Hindu cultural influence in the region.

Location:

- Island Base: Located on the fertile volcanic plains of Java Island, Indonesia.
- Administrative Borders: Straddles the provincial border between the Special Region of Yogyakarta and Central Java.

Origin and History:

- The Sailendra and Sanjaya Heyday: Constructed during the 8th and 9th centuries AD (c.850CE) during the peak of the powerful Sanjaya Dynasty, serving as a monumental royal response to the nearby Buddhist Borobudur monument and marking the revival of Shaivite Hinduism in Java.
- The 11th-Century Collapse: Following a political shift of power to East Java and catastrophic earthquakes paired with eruptions from the nearby Mount Merapi volcano, the temple complex was completely abandoned and lay forgotten under jungle overgrowth for centuries.
- The Colonial Rediscovery: Formally rediscovered by British surveyors during the brief British administration of Java in the early 19th century.
- The Restoration Era: Systematic, scientific restoration began in 1918. In 1991, UNESCO inscribed the Prambanan Temple Compounds as a World Heritage Site, and the Indonesian government designated it a National Cultural Property in 1998.

Key Structural and Architectural Characteristics:

- Concentric Square Layout: Designed using a strict geometric pattern of three concentric squares representing different spiritual realms:
- Outer Zone: A large courtyard area that once housed auxiliary wooden structures.
- Middle Zone (Perwara Temples): Originally filled with 224 identical, small guardian shrines arranged in four neat, stepped rows.
- Inner Zone: The elevated, most sacred central platform housing the 16 principal temples.
- The Trimurti Spire Ensemble: The inner square is dominated by three towering, pointed shikharas (spires) dedicated to the Hindu Trinity (Trimurti):
- Shiva Temple: The massive central tower, rising 47 meters high, housing a monumental statue of Shiva Mahadeva.
- Brahma Temple: Situated to the north of the Shiva tower.
- Vishnu Temple: Situated to the south of the Shiva tower.
- Vahana Companion Temples: Directly facing the three main Trimurti shrines are three smaller companion temples dedicated to their sacred animal mounts (vahanas): Nandi, Hamsa, and Garuda.
- The Javanese Ramayana Bas-Reliefs: The inner gallery walls are adorned with intricate, narrative stone carvings that illustrate the Indonesian version of the Ramayana and Bhagavata Purana epics.
- Interlocking Stone Engineering: Built using ancient Javanese masonry techniques that rely on dry, interlocking stone joints without mortar, giving the massive spires the flexibility to survive baseline seismic tremors.

Pandavani Folk Tradition



Context:

President of India and other senior leaders paid rich tributes to the legendary Padma Vibhushan awardee Teejan Bai, who passed away in Raipur, Chhattisgarh, at the age of 72.

Pandavani Folk Tradition

AboutPandavani Folk Tradition:

What It Is?

- Pandavani (literally meaning Songs and Stories of the Pandavas) is a highly expressive folk theater and ballad singing style from central India. It involves the musical narration and dramatic reenactment of episodes from the ancient Indian epic, the Mahabharata, focusing heavily on Bhima (the second Pandava brother) as the central hero.

Geographical Region:

- Primary Hub: Chiefly popular in the central Indian state of Chhattisgarh.
- Neighboring Belongs: Widely performed in the adjoining cultural belts of Madhya Pradesh, Odisha, and Andhra Pradesh.

History and Cultural Evolution:

- Ancient Origins: Pandavani's exact origin is unknown and is believed by local tradition to date back to the Mahabharata, preserving epics through oral storytelling.
- The Gender Shift: Once a male-dominated tradition, Pandavani witnessed a major transformation in the 1980s as Teejan Bai and other women emerged as leading performers.
- The Ballad Tradition: Pandavani is part of India's oral storytelling tradition, sharing similarities with the Baul singers of Bengal and early Kathak narrators.

Aim:

- To educate the public on moral, administrative, and ethical dilemmas using the philosophical lessons of the Mahabharata.
- To pass down localized, tribal, and regional interpretations of classical Indian mythology.

Key Structural Features:

- The Tambura as a Multi-Prop: The singer uses an Ektara or Tambura as a symbolic prop, transforming it into Bhima's mace, Arjuna's bow, or Draupadi's hair during the narration.
- Supporting Ensemble: Harmonium, Tabla, Dholak, and Manjira accompany the narrator, while supporting singers interact through questions, humour, and dramatic commentary.
- Vedamati Shaili: A structured style based on Sabbal Singh Chauhan's Mahabharat in Doha-Chaupai metre, emphasizing faithful narration of the text.
- Kapalik Shaili: An improvisational style where performers rely on memory, creativity, and personal interpretation, popularized by Teejan Bai and other renowned artists.

Significance:

- Pandavani presents the Mahabharata in local dialects and folk idioms, making its values and philosophy accessible to rural and tribal communities.
- Women performers like Teejan Bai transformed Pandavani by breaking gender barriers, inspiring greater participation and empowerment through folk arts.

Commoditising AI as India's Next DPI

Context:

Public policy experts proposed Artificial Intelligence as India's next Digital Public Infrastructure (DPI), advocating lower inference costs and open-source models inspired by Aadhaar, UPI, and DEPA.



Commoditising AI as India's Next DPI

AboutCommoditising AI as India's Next DPI:

What it is?

- Commoditising AI as India's next Digital Public Infrastructure (DPI) means treating AI intelligence and inference as an affordable, accessible, and interoperable public utility rather than a costly commercial product.

Why AI Should Become India's NextDigital Public Infrastructure(DPI)?

- Natural Progression of India's DPI Stack: India has built a integrated public digital ecosystem by combining digital identity (Aadhaar), zero-cost instant payments (UPI), and consent-based data sharing (DEPA). Making AI intelligence the fourth foundational layer is a logical next step.
- Escaping the Extractive Digital Quarry Model: India currently exports raw data, research talent, and dataset-labeling labor to Silicon Valley, only to import finished AI intelligence at high, dollar-priced API token rates. Treating AI as a public utility helps address this imbalance.
- Demo-Democratic Access to Cognition: High token costs make advanced AI tools a privilege for well-funded entities. Commoditizing compute and inference makes AI accessible for rural healthcare, local-language education, and small businesses.
- Shifting Economic Value toApplication Builders: Lowering the cost of foundational models shifts economic value toward application developers, where India's software engineering ecosystem is strongest.
- Preventing Sovereign Dependency on Western Tech Giants: Building businesses on closed-source, foreign proprietary APIs leaves Indian startups vulnerable to price changes or policy shifts determined abroad.

Initiatives Taken So Far:

- The IndiaAI Mission: Launched with an outlay of 10,372 crore, this public-private framework expands affordable compute access for domestic researchers and startups.
- Public GPU Compute Aggregation: Onboarded over 38,000 GPUs (with plans to scale to 1,00,000), offering GPU compute to verified startups at roughly 65 per GPU hour.
- Open-Source Indic Initiatives (BHASHINI): Built public datasets and translation models across official languages to support multilingual AI tools.

Challenges in India's AI Ecosystem:

- High Dependence on Foreign Compute and Hardware: India lacks domestic semiconductor manufacturing for high-end AI chips, leaving it reliant on imported GPUs.
- Lack ofDedicated Energy Planning for Data Centers: Power grid planning does not yet classify AI workloads as a distinct category, leading to energy constraints for compute infrastructure.
- Dominance of Closed-Source Western Models: Most advanced foundation models are proprietary systems owned by foreign tech companies, creating long-term strategic vulnerabilities.
- Scarcity of Crated, Representative Local Language Datasets: AI training data remains heavily skewed toward Western contexts, with limited structured digital data in regional Indian languages.

- High Dollar-Denominated API Costs for Startups: Indian developers face high per-token costs when renting foreign proprietary models, limiting experimentation at scale.

Roadmap for India'sAI Token Economy:

- Integrating AI Compute into National Power Planning: Fold data center compute needs into the National Electricity Plan, fast-tracking renewable energy and transmission lines to reduce electron costs.
- Mandating Open-Weight Models for Publicly Subsidized Projects: Require any AI model trained using state-subsidized compute or anonymized public datasets to be released under an open-weights license.
- Building aUnified Intelligence Interface (UII): Create an open, interoperable API gateway—functioning like a UPI for AI—that allows any application to connect to open-source or proprietary models.
- Implementing a National Freemium Token Allocation: Provide verified startups, students, and educators with monthly state-subsidized API token allowances linked to digital identity.
- Repurposing Portions of Existing Subsidies for AI Skilling: Reallocate a small fraction of existing agricultural or industrial subsidies into token entitlements for schools and R&D institutions.

Conclusion:

Making AI an affordable, open-source public utility can help India transition from a provider of raw data into a hub for digital application innovation. By combining compute access, open-weight Indic models, and a Unified Intelligence Interface, India can broaden access to advanced technology. Ultimately, commoditizing AI ensures that technological progress translates into inclusive economic growth for all.

The Prevention of Insults to National Honour Act, 1971

Context:



Parliament passed the Prevention of Insults to National Honour (Amendment) Bill, 2026, which amends Section 3 of the 1971 parent Act.

- The legislation officially extends the same penal protections to the National Song (Vande Mataram) that are currently afforded to the National Anthem (Jana Gana Mana).

The Prevention of Insults to National Honour Act

AboutThe Prevention of Insults to National Honour Act, 1971:

What It Is?

- The Prevention of Insults to National Honour Act, 1971 (Act No. 69 of 1971) is a central statute enacted on December 23, 1971. It prohibits and penalizes intentional disrespect, desecration, or obstruction toward key national symbols across India.

Key Features of the 1971 Act:

- Section 2 (Protection to Flag & Constitution): Criminalizes public acts of burning, defacing, defiling, mutilating, trampling, or showing disrespect toward the Indian National Flag or the Constitution of India. Punishment extends to 3 years imprisonment, a fine, or both.
- Exemption for Lawful Criticism: Explicitly clarifies under Section 2 that bona fide criticism or comments on the Constitution or Flag made to seek lawful amendments do not constitute an offense.
- Section 3 (Protection toNational Anthem): Makes it a punishable offense to intentionally prevent the singing of the National Anthem (Jana Gana Mana) or cause disturbance to any assembly engaged in its singing.
- Section 3A (Enhanced Penalties for Repeat Offenders): Introduced via an amendment in 2003, this section mandates an enhanced minimum sentence of 1 year of imprisonment for second or subsequent convictions under Section 2 or Section 3.
- Universal Jurisdiction: Extends to the whole of India, establishing standard legal compliance for public and institutional protocols involving national symbols.

Aboutthe Prevention of Insults to National Honour (Amendment) Bill, 2026:

What It Is?

- The 2026 Amendment Bill updates Section 3 of the 1971 parent Act to explicitly include the National Song (Vande Mataram) alongside the National Anthem (Jana Gana Mana) under the statutory umbrella of national honour protection laws.

Key Features of the 2026 Bill:

- Substitution of Section 3: Replaces the existing text of Section 3 to accord equal legal standing and criminal protection to both Jana Gana Mana and Vande Mataram.
- Criminalization of Disruption: It becomes a criminal offense to intentionally:
- Prevent the singing of the National Song (Vande Mataram).
- Cause disturbance to any assembly engaged in singing the National Song.
- Preserved Quantum of Punishment: First-time convictions carry a penalty of imprisonment for up to 3 years, a fine, or both.
- Applicability of Section 3A to Vande Mataram: Repeat offenders who intentionally obstruct or disrupt the singing of Vande Mataram will now face the mandatory minimum 1-year prison sentence.

Comparative Analysis: 1971 Act vs. 2026 Amendment:

Feature / Provision	Original Act (1971)	Amendment Bill (2026)
Scope of Section 3 Protection	Exclusive legal protection strictly for the National Anthem (Jana Gana Mana).	Expands Section 3 to protect both the National Anthem and the National Song (Vande Mataram).
Prohibited Conduct	Penalizes intentionally stopping or disturbing the singing of the National Anthem.	Penalizes intentionally stopping or disturbing the singing of either the National Anthem or the National Song.
First Offense Punishment	Up to 3 years imprisonment, fine, or both.	Unchanged (Up to 3 years imprisonment, fine, or both).
Repeat Convictions (Sec 3A)	Minimum 1-year mandatory prison sentence for repeat Anthem/Flag offenses.	Extends the minimum 1-year mandatory prison sentence to repeat Vande Mataram disruption offenses.

The FCRA Bill 2026, A Threat To Civil Society Organisations

Context:

The government listed the Foreign Contribution (Regulation) Amendment Bill, 2026 for consideration during Parliament's Monsoon Session.

- The Bill proposes a centralized mechanism to take over, manage, and dispose of assets of civil society organizations whose FCRA registrations are cancelled, surrendered, or not renewed.



The FCRA Bill 2026

AboutThe FCRA Bill 2026, A Threat To Civil Society Organisations:

What it is?

- The Foreign Contribution (Regulation) Amendment Bill, 2026 amends the statutory framework governing how non-governmental organizations (NGOs), trusts, and cultural bodies receive and manage foreign grants. While the original 1976 and 2010 Acts primarily aimed to prevent foreign financial influence in Indian politics and public service, the 2026 Bill focuses on the post-license lifecycle of assets.

Key Features of the FCRA Bill 2026:

- Expanded Scope of Certificate Cessation: An FCRA registration certificate is deemed to have ceased if it

is explicitly cancelled by the government, surrendered by the organization, denied renewal, or if no renewal application is submitted before its five-year expiry.

- Creation of a Designated Authority: Establishes a centralized Designated Authority in which all foreign contributions and physical assets created fully or partially out of foreign funds permanently vest upon license cessation.
- Disposal and CFI Credit: Permanently vested assets can be transferred to government ministries/agencies or auctioned, with all sale proceeds and unutilized foreign funds credited directly to the Consolidated Fund of India (CFI).
- Management of Places of Worship: Where vested assets include a place of worship, the Designated Authority must entrust its management to a prescribed entity while maintaining its distinct religious character.
- Liability of Key Functionaries: Statutory liability for organizational violations is placed on key functionaries (directors, trustees, partners, committee members), requiring them to prove due diligence to avoid prosecution.
- Reduction of Imprisonment Penalty: Reduces the maximum prison sentence for statutory violations from five years to one year while mandating prior central government approval before initiating criminal investigations.

Need for the FCRA Bill 2026:

- Preventing Misuse of Foreign Funds: Ensures that foreign contributions are not diverted into activities that threaten national security, promote forced religious conversions, or incite communal disharmony.
- Managing Defunct and Abandoned Assets: Provides a clear legal process to take over public-utility assets built using foreign funds when an NGO disbands or becomes inactive.
- Example: Preventing physical structures like schools or clinics built via foreign grants from sitting idle after an NGO shuts down.
- Enhancing Financial Transparency and Auditability: Secures full traceability of foreign capital entering the domestic voluntary sector.
- Example: Tracking large-scale fund flows to ensure compliance with national financial protocols.
- Regulating Foreign Inflow Volumes: Manages foreign philanthropic capital to ensure domestic non-profits align with national development goals rather than external agendas.
- Example: Overseeing annual foreign contributions, which exceeded 55,000 crore across 13,000+ entities between 2019 and 2022.
- Standardizing Post-Licensing Asset Governance: Fills a statutory void in the 2010 Act regarding the ownership and state management of physical properties after an organization loses its license.

Challenges to Civil Society Organizations:

- Retroactive Loss of Assets via Non-Renewal: Organizations that choose not to renew their FCRA license to shift entirely to domestic funding face the permanent forfeiture of past assets built with foreign funds.
- Example: A rural hospital built decades ago using FCRA grants could be seized by the Designated Authority if the trust lets its FCRA registration lapse.
- Inability to Exit the FCRA Framework: CSOs are locked into renewing their licenses indefinitely to retain operational assets, requiring them to fulfill mandatory spending thresholds.
- Seizure of MixedDomestic-Foreign Assets: Assets funded only partially by foreign contributions face full seizure, creating severe risks for organizations that pool domestic and international donations.
- Example: A educational facility built using 80% domestic donations and 20% foreign grants can be taken over entirely if the FCRA license ceases.
- Vague Grounds for Cancellation and Lack of Hearing: Broad terms like public interest give the executive significant discretion to cancel licenses without providing a mandatory prior hearing or a clear statutory appeal process for non-renewals. Example: Organizations denied renewal face asset forfeiture without an explicit judicial appeal route under the draft provisions.
- Potential Misuse Against Vulnerable and Minority Groups: Clauses allowing license cancellation over allegations of forced conversion or public disharmony could be exploited through bad-faith complaints.
- Example: Routine local police complaints lodged against minority educational or cultural trusts could trigger immediate provisional asset seizures.

Way Forward:

- Establishing a Proportional Asset Segregation Mechanism: Amend the Bill to ensure that only the specific, verifiable portion of an asset funded by foreign contributions is subject to vesting, protecting domestic-funded infrastructure.
- Creating an Exemption Path for Domestic Transitions: Allow voluntary organizations to exit the FCRA framework and transition to domestic funding without forfeiting assets built legally in the past.
- Inserting MandatoryJudicial Appeal Mechanisms: Provide a statutory right of appeal to the High Court against non-renewal orders and mandate a fair hearing before asset vesting occurs.
- Defining Public Interest with Clear Standards: Replace vague cancellation terminology with precise legal definitions to prevent arbitrary administrative actions against non-profits.
- Protecting Pre-Existing Charitable Assets: Establish safe-harbor provisions for social infrastructure—such as schools, hospitals, and places of worship—to ensure their community benefits continue without operational disruption.

Conclusion:

The requirement that CSOs forfeit their past assets upon non-renewal restricts their ability to transition to domestic funding and threatens developmental initiatives. Balancing national security needs with procedural safeguards, clear appeal channels, and proportional asset protections is essential to maintaining a vibrant, self-reliant civil society.

ILO Convention No. 193

Context:

A major diplomatic and labor debate emerged after India abstained from voting on ILO Convention No. 193 (Decent Work in the Platform Economy) at the 114th International Labour Conference in Geneva.



ILO Convention No. 193

AboutILO Convention No. 193:

What it is?

- Adopted on June 12, 2026, ILO Convention No. 193 is the first binding international treaty establishing a universal floor of rights for platform and gig workers—including ride-hail drivers, delivery riders, pickers, and data labelers.
- The treaty establishes core protections regardless of whether a company classifies a worker as an independent partner or an employee.
- Crucially, it introduces the world's first global standards on algorithmic management, requiring platforms to disclose automated decision-making processes, explain account deactivations in writing, and keep a human in the loop.

Key Data and Statistics on India's Gig Workforce

- Workforce Projections: India's gig workforce stood at ~7.7 million in 2020–21 and is projected by NITI Aayog to reach 2.35 crore (23.5 million) by 2029–30, accounting for 6.7% of the non-agricultural workforce.
- Income Distribution: About 39% of gig workers earn 10,000– 25,000 per month and 34% earn 25,000–40,000 per month, usually spread across grueling 12-hour shifts with self-funded fuel and no overtime pay.
- Social Protection Deficit: Only about 15% of Indian gig workers have access to any social security, leaving 85% without accident cover, sick pay, or pensions.
- Global Scale Context: The World Bank estimates that 154 to 435 million people earn their living through digital platforms globally.

Reasons for India's Abstention:

- Policy of Pre-Conformity: India traditionally ratifies ILO conventions only after domestic laws and administrative frameworks fully conform to international mandates.
- Unoperationalized Central Code: The Central Government relies on its own Code on Social Security, 2020 (enforced in November 2025), which mandates a 1%–2% aggregator turnover contribution, preferring internal frameworks over international treaties.

- Federalism Concerns: Labour is a Concurrent subject under the Indian Constitution, making central enforcement of binding international treaties complex across state jurisdictions.
- Reluctance over Algorithmic & Reclassification Mandates: Article 9 of Convention 193 forces states to reclassify platform workers based on real work conditions, which conflicts with India's current flexible independent aggregator business model.

State-Level Legislative Initiatives vs. Central Framework:

Level	Legislative Action	Key Features & Implementation Status
Central Government	Code on Social Security, 2020 (Enforced Nov 2025)	Defined gig worker; mandated 1%–2% aggregator turnover contribution (capped at 5% of worker payouts) into a fund. Status: Largely unoperationalized with no specified benefit quantum.
Rajasthan	Platform-Based Gig Workers Act, 2023	Enacted a welfare board, mandatory registration, and transaction-based welfare fee levies on aggregators.
Karnataka & Telangana	State Gig Worker Welfare Bills/ Boards	Drafted state-level welfare boards and fee structures to provide accident cover, health benefits, and grievance redressal.

Impact of Abstention on Gig Workers:

- Entrenches Classification Fictions: Allows platforms to continue treating workers as independent contractors, denying them statutory minimum wages, paid leave, or overtime pay.
- Leaves Algorithmic Management Unregulated: Workers remain exposed to arbitrary black-box account deactivations, opaque fare calculations, and automated performance tracking without human explanation.
- Denies Judicial Enforcement under International Standards: Without ratification, workers cannot leverage international treaty rights in Indian courts to challenge aggregator practices.
- Creates aGlobal Rights Divide: Widens the rights gap between gig workers in ratifying nations (like China, Brazil, or Germany) and those in India.

Way Forward:

- Operationalize the Code on Social Security: Immediately notify specific benefit structures, eligibility rules, and contribution collection mechanisms for the central Social Security Fund.
- MandateAlgorithmic Transparency: Introduce regulations requiring platforms to provide written explanations for account suspensions, automated pay deductions, and rating drops.
- Establish a Human-in-the-Loop Requirement: Mandate that all major platform decisions—especially account deactivations and penalizations—be subject to human review.
- Harmonize State and Central Welfare Laws: Align state welfare board models (like Rajasthan's and Karnataka's) with central frameworks to ensure portable social security across state borders.
- Progressive Alignment with Convention 193: Phase in core guarantees of Convention 193 into national law to prepare for eventual ratification.

Conclusion:

India's abstention on ILO Convention No. 193 reflects a preference for domestic legislative flexibility over binding international obligations. However, as India's gig economy expands toward 2.35 crore workers by 2030, relying on unoperationalized central rules leaves millions vulnerable to opaque algorithms and social insecurity. Bridging the gap requires operationalizing social security funds, enforcing algorithmic transparency, and protecting workers' basic rights.

Criminalisation of Politics

Context:



The Association for Democratic Reforms (ADR) and National Election Watch (NEW) released a report analyzing the self-sworn affidavits of India's 31 incumbent Chief Ministers.

Criminalisation of Politics

AboutCriminalisation of Politics:

What It Is?

- Criminalisation of politics refers to the increasing participation and election of individuals with criminal backgrounds to public offices, including legislatures and executive positions.
- It undermines democratic governance by allowing persons facing serious criminal charges to influence law-making and public administration.

Key Findings of the ADR–NEW Report:

- 45% (14 out of 31) Chief Ministers have declared criminal cases against themselves.
- 35% (11 Chief Ministers) face serious criminal cases, including offences punishable with imprisonment of five years or more.
- Two Chief Ministers have declared cases related to attempt to murder.
- The average declared assets of Chief Ministers stand at 118.07 crore, with four Chief Ministers reporting assets exceeding 100 crore.
- D.K. Shivakumar (Karnataka) is the wealthiest Chief Minister with declared assets of over 1,413 crore.
- The analysis is based on self-sworn election affidavits filed by all 31 incumbent Chief Ministers before their most recent elections.

Implications:

- Weakens Democratic Credibility: The presence of elected representatives facing serious criminal charges erodes public trust in democratic institutions.
- Influences Governance: Criminal backgrounds may affect ethical decision-making, transparency, and accountability in public administration.
- Highlights Need forElectoral Reforms: Reinforces the demand for faster disposal of criminal cases against politicians and stronger electoral transparency.

Union Minister Resignation and Reappointment

Context:



Following Dharmendra Pradhan's resignation over the entrance examination paper leak controversy, Pralhad Joshi was given additional charge of the Ministry of Education.

Union Minister Resignation and Reappointment

AboutUnion Minister Resignation and Reappointment:

What It Is?

- A ministerial resignation occurs when a member of the Union Council of Ministers voluntarily steps down or is asked to vacate office by the Prime Minister, requiring a formal constitutional procedure to reallocate or reassign the portfolio.

Constitutional Articles Associated:

- Article 75(2): Specifies that Ministers hold office during the pleasure of the President.
- Article 75(1): Mandates that the Prime Minister is appointed by the President, and other Ministers are appointed by the President on the advice of the Prime Minister.
- Article 75(3): Outlines the principle of Collective Responsibility of the Council of Ministers to the Lok Sabha (House of the People).

- Article 77(3): Authorizes the President to make rules for the allocation of government business among Ministers (Government of India Allocation of Business Rules).

Procedure of Resignation:

1. Submission: The Constitution does not prescribe the procedure for ministerial resignation. By parliamentary convention, a Minister resigns through the Prime Minister.
2. Recommendation: The Prime Minister evaluates the resignation and formally advises the President of India to accept it.
3. Presidential Acceptance: The President accepts the resignation under Article 75(2), and a official notification is issued by Rashtrapati Bhavan.

Key Features:

- Individual Accountability: Reflects the principle where a Minister accepts personal or moral responsibility for administrative lapses, policy failures, or operational irregularities in their department.
- Preservation ofCollective Responsibility: Allows individual ministerial changes without disturbing the overall cabinet majority or requiring the entire Council of Ministers to step down.
- Immediate Effect: Upon presidential acceptance, the minister immediately relinquishes all executive powers and duties associated with that portfolio.

Appointment of New Minister & Procedure

General Procedure:

- Prime Minister's Prerogative: The Prime Minister decides whether to induct a new member into the Council of Ministers or allocate the vacant portfolio as an additional charge to an existing Cabinet Minister.
- Presidential Order: The President, acting on the Prime Minister's advice, issues a communiqué assigning the portfolio.

Oath of Office:

- Fresh Induction: If a new person is inducted into the Cabinet, they must take the Oath of Office and Secrecy administered by the President under the Third Schedule of the Constitution.
- Additional Charge: If the portfolio is assigned to an existing Minister who has already taken the oath, no fresh oath of office is required.

AI & India's Informal Women Workers

Context:



Renewed attention was drawn to the need for ensuring that AI productivity gains benefit informal women workers. Without gender-responsive AI governance and design, digital expansion could deepen existing inequalities.

AI & India's Informal Women Workers

AboutAI & India's Informal Women Workers:

What it is?

- Integrating AI with India's informal female workforce involves leveraging technologies such as real-time advisory platforms, natural language processing, and automated decision-making to enhance productivity across agriculture, domestic work, and micro-enterprises.
- Rather than replacing labor, gender-responsive AI can democratize economic opportunity by tailoring digital tools to local dialects, land access patterns, and mobility constraints.

Key Data and Statistics:

- High Share of Informal Employment: Approximately 82% of employed women in India work in the informal sector, spanning agriculture, home-based production, and micro-enterprises.

- Predominance in Agriculture: According to the PLFS 2023–24 report, 76.9% of rural working women are engaged in agriculture, making them the primary constituency for agricultural AI tools.
- High Impact of Tailored AI Tools: A 2024 study on the multilingual AI tool Farmer.Chat across 12 states revealed that 61% of female users experienced an improved quality of life within 45 days, recording engagement rates 2 to 3 times higher than male users.
- Existing Digital Public Infrastructure: India has established foundational public assets including the IndiaAI Mission, the BHASHINI multilingual translation platform, and the national AI Governance Guidelines released in November 2025.

Governance Priorities to Empower Women via AI:

- Mandating Gender Impact Assessments: Operationalize fairness and equity by requiring gender impact assessments for AI systems affecting economic welfare, examining whether outcomes vary across sex, caste, location, and disability.
- Applying Gender-Responsive AI Budgeting: Subject public AI spending to structured evaluations checking which barriers (language, safety, access) are being addressed and identifying specific funding lines for corrective action.
- Integrating AI Literacy into Community Infrastructure: Embed digital skilling programs within trusted schemes such as DAY-NRLM, DDU-GKY, Skill India, and Mission Shakti's Sakhi networks.
- Establishing Digital Safety as a Precondition: Enforce the IT (Amendment) Rules 2021 and proposed mandatory labelling of AI-generated synthetic content to protect women from tech-facilitated gender-based violence.

Challenges and Threats Associated:

- Amplification of Algorithmic Bias: AI systems trained on unrepresentative datasets risk reinforcing traditional gender stereotypes, discrimination, and digital exclusion.
- Lack ofAlgorithmic Transparency ("Black-Box" Decisions): Unexplainable automated decisions in credit scoring, job allocations, or welfare delivery disproportionately erode trust among marginalized groups.
- Digital "Chilling Effect" from Online Violence: Technology-facilitated harassment, deepfakes, and non-consensual imagery discourage women from participating fully in digital economic spaces.
- Usability and Language Barriers: Conventional digital interfaces often fail to account for the time constraints, lower formal literacy levels, and regional language requirements of informal women workers.

Way Forward:

- Enforcing Inclusive AI Procurement Standards: Require gender-responsive testing, local dialect integration, and clear explainability in all government-procured AI platforms.
- Scaling Hyper-Local Multilingual Models: Expand voice-based interfaces built on BHASHINI to provide customized crop, credit, and market advisories for women farmers.
- Focusing onOutcome-Based Skilling: Align community-level training through Self-Help Groups (SHGs) toward tangible outcomes, such as navigating service platforms or transitioning to better-paid work.
- Implementing Inter-Ministerial Cyber Reforms: Act on National Commission for Women recommendations to establish swift, regional-language grievance redressal mechanisms for online safety.

Conclusion:

The true success of India's AI transformation on the road to Viksit Bharat 2047 will be judged by whether productivity gains reach women at the base of the economic pyramid. By embedding gender-responsive design, robust digital safety, and accessible community skilling into technological infrastructure, India can turn AI into an engine for inclusive growth. Ultimately, equipping informal female workers with tailored AI tools ensures that technological advancement translates directly into social and economic empowerment.

Rajya Sabha Rule 176 and Rule 267

Context:



Disagreements frequently arise between the Opposition and the Union Government over how urgent public issues should be raised in Parliament.

- In the Rajya Sabha, these disputes center on whether discussions should take place under Rule 176 (Short-Duration Discussion) or Rule 267 (Suspension of Rules).

Rajya Sabha Rule 176 and Rule 267

AboutRajya Sabha Rule 176 and Rule 267:

About Rule 267: Suspension of Rules:

- Rule 267 allows a member to move a motion to suspend the listed business of the day to immediately discuss a matter of urgent public importance.
- Mechanism: Requires the explicit prior consent of the Rajya Sabha Chairman.
- Effect: If admitted, all scheduled legislative business for the day is set aside.
- Voting & Closure: Discussion can be followed by a formal motion and a vote, which carries political weight for the government.

About Rule 176: Short-Duration Discussion:

- Rule 176 provides a mechanism to hold a short-duration discussion on a matter of urgent public importance without disrupting the day's scheduled agenda.
- Notice Requirements: A member submits a written notice to the Secretary-General, accompanied by an explanatory note and supported by at least two other members.
- Time Allotment: The Chairman, in consultation with the Leader of the House, fixes a date and time for the debate, capped at a maximum of 2.5 hours.
- No Formal Vote: The discussion does not involve a formal motion or voting; the Minister concerned gives a reply at the end of the debate.

Differences Between Rule 176 and Rule 267:

Parameter	Rule 176 (Short-Duration Discussion)	Rule 267 (Suspension of Rules)
Primary Objective	Discuss an urgent issue without setting aside the day's agenda.	Halt all listed business to take up an extraordinary issue immediately.
Impact on Agenda	Regular parliamentary business continues as scheduled.	Scheduled business is entirely suspended.
Time Limit	Capped at a maximum duration of 2.5 hours.	No fixed ceiling; can consume the entire working day.
Voting Mechanism	No formal motion or voting takes place.	Can lead to a voting process on a specific resolution.
Typical Proponent	Preferred by the Treasury Benches (Government) for limited debate.	Invoked by Opposition members to demand immediate government accountability.

Corresponding Provisions in the Lok Sabha:

- Rule 193 (Short-Duration Discussion): The Lok Sabha equivalent of Rule 176. Allows members to raise urgent matters via written notice without a formal motion or voting.
- Adjournment Motion (Rule 56): Similar in spirit to Rule 267. It interrupts the regular business of the Lok Sabha to discuss a definite matter of urgent public importance, involving an element of censure against the government.

The Public Examinations (Prevention of Unfair Means) Act, 2024

Context:

Following widespread public outrage over paper leaks in competitive entrance tests like NEET-UG, the Union Cabinet approved amendments to The Public Examinations (Prevention of Unfair Means) Act, 2024.



The Public Examinations (Prevention of Unfair Means) Act, 2024

About The Public Examinations (Prevention of Unfair Means) Act, 2024:

What It Is?

- The Public Examinations (Prevention of Unfair Means) Act, 2024 is central legislation passed by Parliament to curb paper leaks, cheating, and organized malpractices in national recruitment and entrance examinations.

Target Examination Authorities:

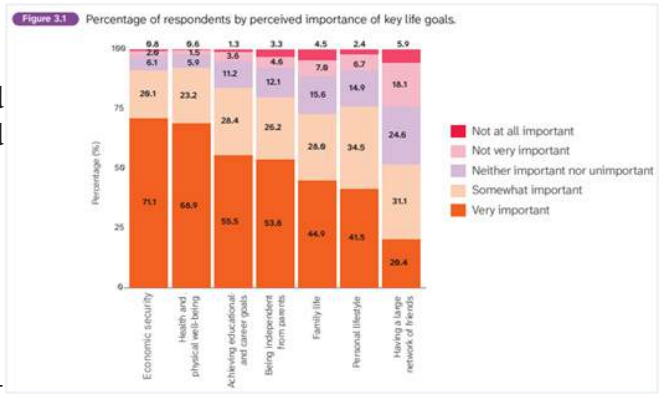
Applies directly to public examinations conducted by scheduled central bodies, including:

- Union Public Service Commission (UPSC)
- Staff Selection Commission (SSC)
- Railway Recruitment Boards (RRBs)
- National Testing Agency (NTA)
- Institute of Banking Personnel Selection (IBPS)
- Central Government Departments and their attached offices.
- Aim: To deter organized syndicates, cheating networks, and rogue service providers from compromising examination integrity, ensuring a transparent, merit-based selection process for millions of students and job aspirants across India.

Key Features of the Act:

- ComprehensiveDefinition of Unfair Means: Explicitly penalizes unauthorized access or leakage of question papers/answer keys, assisting candidates, tampering with computer networks, falsifying merit lists, and running fake exam portals/admit card scams for monetary gain.
- Penalties for Individual Offenses: Individuals or accomplices indulging in unfair means face imprisonment ranging between 3 and 5 years, alongside a fine of up to 10 lakh.
- Strict Liability for Service Providers: IT and infrastructure vendors supporting exam boards face fines up to 1 crore, recovery of full examination costs, and a 4-year ban from conducting public examinations if found guilty of security breaches or unauthorized exam center relocations.
- Personal Management Liability: Directors, senior managers, or persons-in-charge of service providers who consent to or connive in cheating schemes are held personally liable, facing 3 to 10 years imprisonment and a 1 crore fine.
- StringentPunishments for Organised Crimes: Defines organized syndicates committing paper leaks as organized crime, punishable with 5 to 10 years imprisonment (with proposed amendments pushing maximum sentences higher) and a minimum fine of 1 crore.
- Property Attachment: Institutions or commercial coaching centers found guilty of organized cheating face property attachment, forfeiture, and full cost recovery for re-conducting cancelled exams.
- Cognizable and Non-Bailable Status: All offenses under the Act are cognizable, non-bailable, and non-compoundable.
- Senior Investigation Cadre: Investigations must be conducted by police officers not below the rank of Deputy Superintendent of Police (DSP) or Assistant Commissioner of Police (ACP), with provisions to transfer cases directly to central agencies like the CBI.

The UNFPA Demographic Futures Survey 2026



Context:

The United Nations Population Fund (UNFPA) published its groundbreaking global study, the Lives, Choices and Futures — Demographic Futures Survey 2026.

UNFPA

About The UNFPA Demographic Futures Survey 2026:

What it is?

- The Demographic Futures Survey 2026 is a cross-

national, global study designed by UNFPA to examine the aspirations, relationship patterns, and family decisions of young adults aged 18–39. Sampling 108,926 internet-connected young adults across 73 countries and territories, it provides comparative data on how economic, social, and institutional factors shape transitions to adulthood.

Key Findings of the Report:

- Persistence of Marriage Ideals: Over two-thirds of surveyed young adults prefer a living arrangement that includes marriage—36% favoring marriage before cohabitation and 34% after cohabiting.
- Aspiration vs. Reality Gap: Among respondents aged 25–39 who wish to marry or live with a partner, 25% are currently single and not dating, with a higher share among men (30%) than women (19%).
- EconomicDemands for Partnership: Financial security is rated as the most critical consideration for entering a partnership (81%), with economic and housing barriers listed as primary obstacles (57%).
- Preconditions for Parenthood: Financial stability (88%), stable employment (87%), and emotional readiness (85%) rank as the top three non-negotiable thresholds before having children.
- Personal Joy Over Policy Drivers: 80% of respondents state that the joy and happiness children bring is their top motivation for parenthood, whereas state incentives and workforce contributions rank among the lowest motivators.
- Structural Barrier to Family Size: Economic and housing constraints represent the single highest barrier to parenthood globally (72%), followed by the lack of a suitable partner and reproductive health concerns.
- DecliningAchieved Fertility: Across all world regions, the average number of children among older respondents (aged 35–39) is consistently lower than the ideal number reported by younger cohorts (aged 18–39).
- Indian Specific Trends: In India, women aged 18–39 desire an ideal family size of 2.1 children (compared to an actual average of 1.0 child among those aged 35–39), while Indian men report an ideal of 2.2 children (versus 1.1 actual).

Positives Identified in the Survey:

- ResilientYouth Optimism: Roughly two-thirds (66%) of global respondents feel positive about their future, led by high optimism in West & Central Africa (62% very positive).
- High Desire for Parenthood: Among childless respondents aged 35–39 in India, nearly 85% express a strong desire to become parents if conditions permit.
- Perception of Opportunities: 58% of respondents agree that young people in their countries have strong life opportunities, particularly across developing economies.
- Digital & Social Networking Channels: Personal networks (33%), work/school (28%), and digital platforms (16%) provide reliable avenues for young adults to find compatible partners.

Key Challenges Identified:

- Severe Economic and Housing Constraints: Rising living costs, expensive housing, and job market instability delay both partnership formation and family expansion.
- Macro-Environmental Anxiety: Over three-quarters of young adults report being deeply worried about conflict, security risks, economic insecurity, and social inequality.
- Unequal Distribution of Care: Traditional gender expectations persist; respondents show significantly higher disapproval when a mother works full-time with a child under three (29%) compared to a father in the same situation (20%).
- Lack of Perceived State Support: Only 39% feel their governments provide adequate institutional support for young people or parents with young children, while similar low numbers cite support for work-life balance from employers.

UNFPA Policy Recommendations:

- Enhance Economic Security & Affordable Housing: Governments must formulate economic policies that ensure stable youth employment, wage growth, and accessible housing frameworks.
- Expand Accessible Childcare & Parental Leave: Strengthen workplace support systems through gender-equitable parental leave and affordable public childcare facilities to balance career and family life.

- Promote Gender Equality inUnpaid Care Work: Address structural gender biases in the labor market and foster societal shifts toward an equitable share of household care responsibilities.
- Adopt a Rights-Based Demographic Framework: Shift population policies away from rigid birth targets toward empowering individual choice, reproductive agency, and institutional support systems.

Conclusion:

The UNFPA 2026 report confirms that falling birth rates are driven by economic and social constraints rather than a declining interest in family life. Young people around the world continue to value marriage and parenthood, but need secure jobs, affordable housing, and supportive public policies to realize these goals. Ultimately, building resilient societies requires governments to address structural inequalities so young adults can freely build the families they desire.

Defections Affect Moral Sanctity of Democracy

Context:

A public debate emerged following recurring political realignments and defections across major regional parties like the Shiv Sena (UBT) and the Trinamool Congress.



Defections Affect Moral Sanctity of Democracy

AboutDefections Affect Moral Sanctity of Democracy:

What is defection?

- Defection refers to the act by an elected representative of abandoning allegiance to the political party on whose ticket or symbol they were elected to join another party or function independently. Popularly termed "Aaya Ram, Gaya Ram" politics, defection transforms a solemn public mandate into a transactional asset traded for political office, power, or personal protection.

Constitutional Provisions and What Amounts to Defection:

- Defection is governed by the Tenth Schedule of the Constitution of India, inserted via the 52nd Constitutional Amendment Act, 1985. The associated articles defining disqualification are:
- Article 102(2): Disqualification criteria for Members of Parliament (Lok Sabha and Rajya Sabha).
- Article 191(2): Disqualification criteria for Members of State Legislative Assemblies (MLAs) and Councils (MLCs).

A legislator incurs disqualification under the Tenth Schedule if:

1. They voluntarily give up membership of their political party (determined by explicit resignation or implied conduct).
2. They vote or abstain from voting in the House contrary to any direction (whip) issued by their political party without prior permission or post-facto condonation within 15 days.
3. An Independent elected member joins any political party after the election.
4. A Nominated member joins any political party after the expiry of six months from taking their seat.

Note: The 91st Constitutional Amendment Act, 2003 abolished the "one-third split" exception. Currently, protection from disqualification requires a merger involving at least two-thirds of the members of the legislature party.

Reasons for the Rise in Defections in India:

- The Pursuit of Power and Patronage: Political ideology has increasingly taken a backseat to pragmatism, with legislators defecting primarily to secure cabinet berths or administrative control.
- Weaponization of Investigative Agencies: Elected representatives facing corruption inquiries or legal challenges frequently defect to ruling parties to obtain political immunity and reduce investigative intensity.
- Partisan Role of the Speaker: Speakers often delay decisions on disqualification petitions indefinitely to allow ruling coalitions to survive floor tests, serving political rather than judicial interests.
- Exploitation of the Merger Loophole: Defecting groups bypass individual disqualifications by leveraging the two-thirds merger exemption under Paragraph 4 of the Tenth Schedule.
- Absence of Strict Internal Party Democracy: Monopolistic party command structures stifle internal dissent, prompting frustrated leaders to defect rather than challenge the leadership internally.

How Defection Breaks the Moral Sanctity of Democracy?

- Unilateral Betrayal of the Voter's Contract: Citizens cast ballots based on a party's manifesto, symbol, and ideology. Defecting after an election converts a collective public mandate into personal property.
- Erosion of the Institutional Opposition: Continuous migration of opposition legislators to ruling parties weakens parliamentary oversight, transforming elections into struggles for power rather than contests of ideas.
- Undermining Public Faith in Democratic Neutrality: Strategic realignments to escape legal probes erode public confidence that investigative and state institutions operate fairly.
- Normalizing Transactional "Marketplace" Governance: Defection reduces political office to a tradable asset—similar to historical "Transformismo"—where governments are held together by patronage rather than principle.
- Dispossessing the Voter: When elected officials switch parties, voters are left without genuine representation, reducing democratic choices to empty political theater.

Key Supreme Court Judgments on Anti-Defection:

- Kihoto Hollohan v. Zachillhu (1992): The Supreme Court upheld the constitutional validity of the Tenth Schedule, ruling that the Speaker acts as a quasi-judicial tribunal and their decisions are subject to judicial review by High Courts and the Supreme Court.
- Keisham Meghachandra Singh v. Speaker, Manipur (2020): The Court ruled that Speakers must decide disqualification petitions within a reasonable timeframe—setting a firm outer limit of three months—and recommended establishing an independent permanent tribunal for disqualifications.
- Subhash Desai v. Governor of Maharashtra (2023): The SC clarified that the defense of a "split" is no longer valid under the Tenth Schedule. It held that a Governor cannot call for a trust vote based purely on internal party dissent without objective evidence.
- Padi Kaushik Reddy Case (2025): Reaffirming the Keisham Meghachandra principle, the Apex Court directed the Telangana Speaker to decide pending MLA disqualification petitions within three months, stating that setting strict timelines is legally binding to prevent endless delays.

Way Forward:

- Transferring Adjudication to an Independent Tribunal: Shift the authority to decide defection cases from the Speaker to an independent body, such as a tribunal chaired by a retired judge or the Election Commission of India.
- Enforcing Enforceable Time-Bound Decisions: Amend the Tenth Schedule to mandate that all disqualification petitions must be resolved within a strict 60-to-90-day window.
- Mandatory Resignation and Bar on Public Office: Mandate that any defecting legislator automatically forfeit their seat and be barred from contesting elections or holding public office for the remainder of that legislative term.
- Restricting the Application ofthe Party Whip: Limit the enforcement of political party whips strictly to crucial votes, such as No-Confidence Motions, Money Bills, and Budget approvals, allowing internal debate on general legislation.
- Strengthening Electoral Accountability and Citizen Voice: Foster public awareness through civil society groups to hold defecting representatives accountable at the ballot box.

Conclusion:

While the Tenth Schedule introduced an initial framework to curb opportunistic party-switching, systemic loopholes and delays in adjudication have weakened its effectiveness. Protecting the sanctity of the democratic mandate requires transferring disqualification decisions to an independent body and enforcing strict timelines to ensure that political office serves the public good rather than personal ambition.

The Right to Protest in India

Context:

Delhi Police cracked down on a major demonstration by the Cockroach Janta Party (CJP) as thousands of protesters attempted to march toward the Parliament complex.



The Right to Protest in India

About The Right to Protest in India:

What It Is?

- The Right to Protest in India is a recognized democratic mechanism that allows citizens to assemble, express grievances, and challenge state policies. It is not an absolute right, but rather a constitutional freedom balanced against public order, safety, and the rights of the broader public.

Origin and Historical Context:

- The tradition of popular, non-violent marches (Satyagraha) served as a primary strategy during India's struggle for independence.
- Post-independence, the framers of the Constitution embedded this right within the democratic framework to ensure that citizens retained a peaceful means to express dissent outside of periodic elections.

Constitutional Provisions:

- Article 19(1)(a): Guarantees the fundamental freedom of speech and expression.
- Article 19(1)(b): Guarantees the fundamental right to assemble peaceably and without arms.
- Article 19(2) & 19(3) [Reasonable Restrictions]: Authorizes the government to impose legal limits on protests in the interest of the sovereignty and integrity of India, state security, friendly relations with foreign states, public order, decency, morality, or to prevent contempt of court and incitement to offenses.

Key Supreme Court Judgments:

- Himat Lal K. Shah v. Commissioner of Police (1973):Right The Court ruled that freedom of assembly is essential to democracy. It drew a clear constitutional line between reasonable state regulation (like managing traffic) and arbitrary exclusion (outright bans).
- Mazdoor Kisan Shakti Sangathan v. Union of India (2018): Addressing repeated prohibitions around Parliament House, the SC mandated balanced guidelines. It established designated protest sites, set buffer zones around high-security buildings like Parliament and the Supreme Court, and banned weapons or lathis at demonstration sites.
- Amit Sahni v. Commissioner of Police (2020) [Shaheen Bagh Case]: The SC ruled that protests cannot occupy public roads indefinitely or cause major inconvenience to the general public. Demonstrations must be restricted solely to designated areas.

Key Legal and Operational Features:

- Mandatory Police Permission: Organizers must obtain prior administrative and police clearance to hold demonstrations, allowing authorities to manage crowd size, traffic flow, and security.
- DesignatedDemonstration Sites: To protect public mobility, local administrations restrict high-density protests to designated grounds, such as Jantar Mantar and Ramlila Maidan in New Delhi, or Azad Maidan in Mumbai.
- Prohibitory Orders: Local authorities use statutory tools—such as Section 163 of the Bharatiya Nagarik Suraksha Sanhita (BNSS) to restrict unauthorized assemblies when there is an immediate threat to public order.

The Prevention of Insults to National Honour (Amendment) Bill, 2026

Context:



Union Home Minister Amit Shah is set to introduce The Prevention of Insults to National Honour (Amendment) Bill, 2026 in the Rajya Sabha.

The Prevention of Insults to National Honour (Amendment) Bill

About The Prevention of Insults to National Honour (Amendment) Bill, 2026:

What It Is?

- The proposed legislation is an amendment to the parent Prevention of Insults to National Honour Act,

1971, which criminalizes disrespect toward national symbols such as the National Flag, the Constitution, and the National Anthem. The 2026 Bill explicitly expands the scope of the 1971 Act to include the National Song (Vande Mataram).

- Aim: The central objective of the Bill is to plug a long-standing statutory gap in the 1971 Act, which lacked specific penal provisions to protect the national song.
- By adding legal protections, the government aims to fulfill the vision articulated by Constituent Assembly President Dr. Rajendra Prasad on January 24, 1950, that Vande Mataram "shall be honoured equally with Jana Gana Mana and shall have equal status with it."

Key Features of the Bill:

- Substitution of Section 3: Replaces Section 3 of the 1971 Act to place the National Song and National Anthem under the exact same protective legal umbrella.
- Criminalization of Interference: Explicitly makes it a criminal offense for anyone who intentionally:
- Prevents the singing of the National Anthem or the National Song, or
- Causes disturbance to any assembly or gathering engaged in such singing.
- Penalties: Establishes strict criminal sanctions for violators, including imprisonment for a term extending up to three years, a monetary fine, or both.
- Historical Reference: The Bill explicitly cites Bankim Chandra Chatterjee's 1875 composition (later published in Anandamath in 1882) and its historical role in inspiring generations during India's freedom struggle.

Significance:

- Grants Vande Mataram explicit legal protection, placing it on par with the National Anthem under the Prevention of Insults to National Honour Act.
- Rekindles debate over balancing national honour with Article 19 freedoms, as critics question whether legal compulsion undermines voluntary patriotism.

Building an Atmanirbhar Philanthropy Ecosystem

Context:

Social sector leaders called for building an "Atmanirbhar Philanthropy Ecosystem", highlighting that domestic philanthropy has overtaken foreign funding as the main driver of social development.



Building an Atmanirbhar Philanthropy Ecosystem

AboutBuilding an Atmanirbhar Philanthropy Ecosystem:

What it is?

- Philanthropy is the practice of voluntarily donating private resources—including financial capital, time, expertise, and governance—to advance the public good and address systemic social challenges.
- Building an "Atmanirbhar" (self-reliant) philanthropy ecosystem means transitioning India away from historical reliance on international developmental aid toward a self-sustaining framework financed, led, and owned by domestic entrepreneurs, corporate entities, and ordinary citizens.

Key Features and Ethical Principles Behind Philanthropy:

- Stewardship of Wealth: Viewing private capital accumulation not as personal property, but as a public trust to be used for the welfare of society.
- National Ownership and Accountability: Ensuring that domestic citizens fund local social challenges, bringing direct governance, volunteerism, and local context to non-profit efforts.
- Transparency and Governance: Operating with high standards of compliance and institutional trust, ensuring that non-profits earn public and investor confidence.

- Democratization of Giving: Expanding participation beyond high-net-worth individuals so that everyday retail givers can contribute through modern digital rails.
- Catalytic and Long-Term Capital: Providing patient, risk-tolerant funding for social innovation, research, and institutional capacity building that outlasts short-term market cycles.

The Rise of Domestic Giving:

- Dominance of Domestic Private Capital: Domestic private giving now exceeds 1.18 lakh crore annually, making it more than five times larger than annual foreign philanthropic contributions.
- Accelerated Family Philanthropy: Family philanthropy is growing at double-digit rates, driven by a new generation of wealth creators who integrate social giving into core business stewardship.
- CSR as a Major Capital Pillar: Corporate Social Responsibility (CSR) has matured into a structural source of developmental funding, channeling over 40,000 crore per year into education, healthcare, and rural livelihoods.
- Mass Digital Payment Infrastructure: The rapid spread of over 220 million demat accounts, systematic investment plans (SIPs), and Unified Payments Interface (UPI) networks provides the infrastructure for retail public giving.
- FCRA Realities vs. Perceptions: While active Foreign Contribution (Regulation) Act (FCRA) registrations stand at around 14,500 out of six lakh voluntary organizations on NITI Aayog's NGO Darpan, total foreign contributions doubled from 10,000 crore to 22,000 crore over the decade.

Key Challenges Associated with the Sector:

- Friction in Regulatory Compliance: Administrative delays in FCRA renewals, long processing times, or cancellations have disrupted legitimate development work in rural healthcare and education.
- Uneven Governance and Institutional Readiness: Many voluntary organizations lack modern documentation systems, financial accounting capabilities, or compliance management, leading to regulatory scrutiny.
- HNWI Giving Lagging Behind Wealth Growth: Giving among India's fast-growing High-Net-Worth Individual (HNWI) community has lagged behind their rate of wealth accumulation.
- Restricted Tax Incentives Under Section 80G: Tax deductions under Section 80G are generally restricted to 50% of donations and capped at 10% of adjusted gross total income, failing to send a strong policy signal for philanthropic giving.
- Illiquid Asset Donation Barriers: First-generation entrepreneurs hold most of their wealth in company equity rather than cash, but regulatory frameworks for donating appreciated listed shares to charities remain underdeveloped.

Way Forward:

- Reforming FCRA Administration Toward Risk-Based Supervision: Implement administrative improvements under FCRA 2.0—such as deficiency notices, fixed correction windows, and an independent appellate body—to punish fraud without penalizing minor administrative slips.
- Modernizing Tax Incentives Under Section 80G: Raise 80G tax deductions from 50% to 100% and elevate the overall income ceiling to 25% to align tax policy with national development goals.
- Enabling Share-Donation Frameworks for Entrepreneurs: Establish clear legal channels allowing founders to donate appreciated listed shares to charities with a 1-to-3-year structured sales window.
- Leveragingthe Social Stock Exchange (SSE): Operationalize the SSE as a trusted national platform to connect credible non-profits with retail donors through standardized impact reporting.
- Promoting Retail Micro-Donations via Digital Payments: Leverage UPI and recurring digital payment platforms to encourage millions of households to contribute small monthly amounts (100– 1,000) to verified social causes.

Conclusion:

India's philanthropic landscape has reached an important turning point, with domestic private capital stepping up as the main driver of social development. While foreign funding will continue to support research and innovation, building a self-reliant philanthropy ecosystem ensures that long-term social progress is led and sustained by Indian resources. Ultimately, simplifying regulations and encouraging domestic giving will turn financial wealth into public ownership and strengthen the national social contract.

The Draft National Health Research Policy, 2026

Context:



The Centre's Department of Health Research has officially released the Draft National Health Research Policy, 2026, for public feedback until July 27.

The Draft National Health Research Policy

About The Draft National Health Research Policy, 2026:

What It Is?

- The policy is India's first unified national framework designed to span biomedical science, clinical medicine, public health, epidemiology, digital health, health systems, behavioral sciences, and emerging technologies. It treats health research as a national problem-solving architecture rather than a collection of isolated academic studies.
- Aim: The policy aims to address long-standing issues in India's scientific ecosystem, including fragmented research efforts, wide regional disparities in institutional capacity, and slow translation of scientific findings into government policy or last-mile healthcare delivery.

Key Features of the Draft Policy:

- Targeted GDP Investment Boost: Proposes a six-fold increase in government spending on health research, raising it from the current 024% of GDP to 0.072% by 2037, and reaching 0.15% by 2047.
- Three-Tier Governance Structure: Establishes a clear division of labor: a National Health Research Stewardship Committee for strategic alignment, the Department of Health Research as the nodal implementation agency, and the ICMR providing scientific and technical leadership.
- Dynamic Research Agenda: Replaces disjointed research models with a National Health Research Agenda to identify priorities based on disease burden, equity, and pandemic preparedness, focusing on targets like tuberculosis, antimicrobial resistance (AMR), cancer, and child malnutrition.
- Impact-Based Scientist Evaluation: Shifts the focus of scientific evaluation away from conventional paper counts and journal metrics to the ICMR Impact of Research and Innovation Scale (ICMR-IRIS), which grades researchers on clinical translation and policy influence.
- Institutional Decentralization: Aims to expand research capacity out of a few elite states and institutions by mandating state governments to compile local agendas based on regional disease patterns.
- Simplified Ethics and Administration: Proposes streamlining ethical approvals for multi-center clinical trials, establishing a National Research Integrity Office (NRIO) to curb misconduct, and ensuring shared access to public labs and biobanks.
- Core Technological andData Standards: Places rigorous data governance, cybersecurity, community engagement, and the responsible use of Artificial Intelligence (AI) in medical diagnostics at the absolute center of the research framework.

Significance:

- The ICMR-IRIS framework directs public research towards real-world health needs, promoting affordable indigenous technologies, vaccines, and diagnostics.
- State-level research empowers regional institutions to study local health challenges and strengthen early-warning systems for future outbreaks, supporting Viksit Bharat 2047.

The Draft CAFE-III Norms

Context:



The Ministry of Power, alongside the Bureau of Energy Efficiency (BEE), officially released the Draft Corporate Average Fuel Economy-III (CAFE-III) norms for public and industry consultation.

The Draft CAFE-III Norms

AboutThe Draft CAFE-III Norms:

What It Is?

- Corporate Average Fuel Efficiency (CAFE) norms are regulatory mandates that require automakers to meet a predefined average level of fuel economy and carbon dioxide (CO2) emissions across their entire annual fleet of vehicles sold, rather than scoring individual car models.

History:

- Phase I (CAFE-I): Implemented in FY2017-18, establishing the entry baseline for structured fleet-efficiency tracking.
- Phase II (CAFE-II): Rolled out in FY2022-23, tightening emission parameters further based on an average vehicle weight constant.
- Phase III (CAFE-III): Circulated in July 2026, scheduled to take formal effect on April 1, 2027, running through FY2031-32.
- Aim: Administered under the Energy Conservation Act, these regulations aim to reduce greenhouse gas emissions, improve air quality, and cut oil imports by promoting cleaner vehicles.

Key Features of the CAFE-III Norms:

- ProgressivelyTightened Carbon Targets: Fleet-average targets will shrink from 3.996 liters/100 km (94.76 gCO_2/km) in FY2027-28 to a strict 3.327 liters/100 km (78.90 gCO_2/km) by FY2031-32.
- Shift to the Global WLTP Testing Cycle: The draft formalizes India's migration away from the laboratory-confined Modified Indian Driving Cycle (MIDC) to the globally synchronized Worldwide Harmonised Light Vehicles Test Procedure (WLTP), reflecting real-world on-road driving conditions.
- Flexible Multi-Year Compliance Blocks: Rather than enforcing rigid annual penalties, compliance will be calculated over two larger blocks: a three-year block (FY28-30) followed by a two-year block (FY30-32), giving automakers room to back-load their EV launches.
- First-Ever Carbon Neutrality Factors (CNFs): E20 (20% ethanol-blended petrol) receives an 8% reduction benefit, which jumps up to 22.3% for flex-fuel ethanol vehicles and flex-fuel strong hybrids.
- Revised Super-Credit Multipliers: Battery Electric Vehicles (BEVs) and Range-Extended EVs receive a 3.0x multiplier, Plug-in Hybrids get 2.5x, and Strong Hybrids are scaled back to 1.6x.
- Market-Based Credit Trading System: Introduces an emission permit ecosystem. Manufacturers exceeding their targets earn compliance credits they can bank or sell.
- Expanded Technology Derogation Credits: Automakers can claim up to 9 gCO_2/km in compliance benefits by embedding 12 approved fuel-saving technologies, including automatic engine start-stop devices, regenerative braking setups, smart alternators, and tire pressure monitoring systems (TPMS).

Trial in Absentia

Context:

A Special NIA Court in Jammu issued a non-bailable warrant against Pakistan-based Lashkar-e-Taiba chief Hafiz Saeed in connection with the Pahalgam terror attack case.



- The NIA may seek his trial in absentia under Section 356 of the Bharatiya Nagarik Suraksha Sanhita (BNSS), 2023.

Trial in Absentia

AboutTrial in Absentia:

What It Is?

- Trial in absentia refers to a criminal trial conducted in the absence of the accused.
- Under Section 356 of the BNSS, a court may conduct the inquiry, trial and pronounce judgment against a proclaimed offender who has deliberately absconded to evade trial and has no immediate prospect of arrest.

Origin and Legal Background:

- Under the earlier Code of Criminal Procedure (CrPC), 1973, provisions existed to deal with absconding accused, but they did not generally permit a complete trial culminating in judgment in their absence.
- Section 82(4) of CrPC provided for declaring certain absconding accused as proclaimed offenders, while Section 299 allowed recording evidence in the absence of an absconding accused when there was no immediate prospect of arrest.
- Section 317 of CrPC permitted proceedings in the accused's absence in specified circumstances where personal attendance was considered unnecessary or the accused persistently disturbed court proceedings.
- The BNSS introduced Section 356, creating a specific framework for conducting a full-fledged trial and pronouncing judgment in the absence of a proclaimed offender.

Key Features of Trial in Absentia under BNSS:

- Limited to Proclaimed Offenders: It does not apply to every absent accused. The person must first be declared a proclaimed offender under Section 84(4) of the BNSS.
- Applicable to Serious Offences: The accused must face an offence punishable with at least 10 years' imprisonment, life imprisonment or death under the BNS or any other law.
- Deliberate Absconding Required: The court must be satisfied that the proclaimed offender has absconded to evade trial and that there is no immediate prospect of arrest.
- Absence Treated as Waiver: After recording reasons in writing, the court may treat deliberate absence as a waiver of the right to be present and proceed with the inquiry, trial and judgment.
- Two Consecutive Arrest Warrants: Before commencing the trial, two consecutive warrants of arrest must be issued at an interval of at least 30 days.
- Mandatory Public Notice: A notice giving the accused 30 days to appear must be published in a local or national newspaper and displayed at the accused's last known residence.
- 90-Day Waiting Period: The trial cannot begin until 90 days have elapsed from the date of framing of charges, providing sufficient opportunity for the accused to appear.
- Audiovisual Recording of Evidence: Witness examination and depositions should, as far as practicable, be recorded through audio-visual electronic means and preserved, promoting transparency and facilitating subsequent judicial review.

The Draft Regulations for Use of Artificial Intelligence in Courts, 2026

Context:

The Supreme Court of India's Artificial Intelligence Committee has drafted the Regulations for Use of Artificial Intelligence (AI) in Courts, 2026 to establish a comprehensive governance framework for responsible AI adoption in the judiciary.



The Draft Regulations for Use of Artificial Intelligence in Courts, 2026

AboutThe Draft Regulations for Use of Artificial Intelligence in Courts, 2026:

What it is?

- The Draft Regulations for Use of Artificial Intelligence in Courts, 2026, establish a unified structural and ethical policy framework to govern, optimize, and safely regulate the integration of AI tools across India's judicial spectrum.

Key Summary of the Draft Framework:

- Human Adjudicative Primacy: The policy categorically states that no final judicial outcome, judgment, order, or finding of fact/law can be reached through algorithmic decision-making alone. AI outputs remain strictly advisory and subservient to independent human evaluation.
- The Regulatory Institutional Architecture: Governance will be led by a permanent, full-time Apex Body at the Supreme Court, composed of sitting SC and High Court judges, MeitY officials, and cyber/finance experts.

- Mandatory Proportionality Testing: Before any AI tool is deployed, the administration must conduct a comprehensive Technical and Ethical Impact Assessment evaluating its data sourcing, cybersecurity baseline, explainability, and risk of hallucinations.
- Strict Procurement and Vendor Audits: Private software vendors are subject to strict data-protection contracts. They are explicitly barred from using sensitive judicial data to train or fine-tune proprietary algorithms, and they cannot claim exclusive intellectual property rights over tools built on public judicial resources.
- Localized Testing and Registers: High-risk systems must go through time-limited Controlled Environment Testing in isolated setups. Every court must also maintain an updated public AI Register and an internal AI Incident Database to track errors.
- Enforcing Emergency Fall-Back Protocols: To protect institutional continuity, every High Court must maintain a verified manual fall-back protocol to keep the justice delivery machinery running smoothly if a core AI platform experiences a sudden technical failure.
- Mandatory Litigant Notification: Courts are legally bound to inform litigants and their legal counsel in a timely and accessible manner whenever an approved AI application provides material assistance to a judge in handling their case.
- Structured Grievance Redressal: Litigants who suffer direct or indirect harm due to a prohibited use of AI can file an immediate application for a formal hearing and remedial protection within the court where the system was deployed.

Best Practices in Global Judicial AI Governance:

- The Principle of Data Minimization by Design: Mandating that judicial software tools are structurally built to process, collect, and retain only the absolute minimum amount of personal identifiers needed to complete a specific task, matching the highest international privacy standards.
- Continuous Closed-LoopIn-House Audits: Enforcing periodic, in-house technical and ethical compliance audits at intervals not exceeding one year. This ensures that source code and raw citizen datasets are never shared with or exposed to unverified third-party private contractors.
- Dismantling Black Box Opaque Architectures: Ensuring that high-risk systems affecting personal liberty possess full algorithmic explainability, meaning the logic behind an output can be easily understood by non-technical judicial personnel and litigants.

Absolute Prohibitions on AI Use in Courts:

- No Algorithmic Adjudication: AI is completely prohibited from functioning as an independent adjudicator or sentencing system without a mandatory Human-in-the-Loop architecture.
- Absolute Ban onBehavioral Risk Scoring: AI cannot be deployed to calculate numerical risk scores to estimate flight risk, evaluate bail eligibility, or predict the future behavior of accused individuals.
- Prohibition of Opaque Black Box Systems: The use of unexplainable software applications whose underlying decision logic is hidden from the user is strictly barred in all high-risk legal matters affecting personal liberty.
- Ban on Continuous Surveillance: AI tools cannot be used for the continuous monitoring or surveillance of judicial officers, advocates, or litigants within or in connection with court premises.
- No Undisclosed Evidence Submissions: Parties are completely barred from submitting AI-generated outputs, text, or synthetic documents as independent sources of evidence without fully disclosing their AI-assisted origin.

Significance of AI Integration in the Judiciary:

- Drastically Minimizing Case Backlogs: Utilizing permissible automated AI tools for case filing management and defect scrutiny helps speed up administrative workflows, clearing early bottlenecks.
- Optimizing Resource Allocation: Advanced analytical tools allow registries to track judicial performance and identify systemic delays, enabling data-driven docket prioritization and efficient caseload distribution.
- Improving Multilingual Accessibility: Deploying validated translation applications allows complex judgments and pleadings to be converted into regional vernacular languages, supporting real-world inclusion for diverse communities.
- Accelerating Precision Legal Research: Automated precedent retrieval, document summarization, and

citation verification tools significantly reduce the manual research hours required by judges and staff.

- Enhancing Courtroom Inclusivity Services: Integrating robust speech-to-text, automated transcription, and visual assistance interfaces helps expand equitable access to justice for specially-abled litigants and lawyers.

Conclusion:

By setting absolute prohibitions against automated sentencing and behavioral profiling, the policy successfully protects human rights from algorithmic bias. Moving forward, the success of this transition will depend on maintaining strict in-house audits, fully operationalizing the CoRE-AI research engine, and ensuring that court secretariats receive proper funding to handle technical failures without disrupting everyday court access.

Supreme Court Backlog Clearance



Context:

The Supreme Court has constituted four special benches to exclusively hear its oldest pending civil and criminal cases, as part of Chief Justice of India Surya Kant's strategy to reduce judicial backlog and resolve decades-old litigation.

Supreme Court Backlog Clearance Initiative

AboutSupreme Court Backlog Clearance Initiative:

What It Is?

- The initiative is a special judicial case-management mechanism under which dedicated Supreme Court benches will exclusively hear the oldest pending civil and criminal matters without being burdened by routine fresh cases.

Key Features:

- Four Dedicated Special Benches: Two division benches will exclusively hear the oldest civil cases, while two others will focus solely on long-pending criminal matters.
- Three-Day Weekly Hearings: The special benches will function on Tuesdays, Wednesdays and Thursdays, which are designated as non-miscellaneous days for detailed regular hearings.
- Focus on Legacy Cases: Priority will be given to decades-old disputes, including civil cases pending since 1986 and criminal matters dating back to 1991.
- UninterruptedJudicial Attention: By exempting these benches from miscellaneous hearings, judges can devote sustained attention to complex cases requiring lengthy arguments and final disposal.

Solutions Adopted by the Supreme Court:

- Dedicated Special Benches: CJI Surya Kant has created four exclusive benches to systematically clear the oldest civil and criminal cases.
- Structured Case Listing: Former CJI U.U. Lalit introduced separate time slots for fresh cases and long-pending regular matters to prevent older cases from being neglected.
- Technology-Based Case Management: The SC-JUDICARE project, launched during CJI D.Y. Chandrachud's tenure, automated case classification and grouped matters involving similar legal questions for collective hearings.
- Special Lok Adalats and Thematic Benches: Special benches for categories such as death penalty references and dedicated Lok Adalat weeks have been used to accelerate case disposal.

The Right to be Forgotten

Context:

The Delhi High Court laid down a landmark framework governing the right to be forgotten in India through its ruling in Laksh Vir Singh Yadav v. Union of India.



The Right to be Forgotten

About The Right to be Forgotten:

What it is?

- The right to be forgotten empowers individuals to seek the removal, erasure, or de-indexing of their personal information from public digital platforms and search engines. It is invoked when the continued digital accessibility of such information—like past accusations or obsolete legal disputes—causes ongoing harm and no longer serves any legitimate public interest.

Background of the Right to be Forgotten:

- The European Origins: The concept gained global prominence in 2014 when a Spanish citizen, Mario Costeja González, successfully petitioned the European Court of Justice against Google to remove outdated newspaper notices regarding a settled debt.
- Codification in the EU: Following the Spanish landmark ruling, the right to erasure was formally codified and incorporated into Article 17 of the European Union's General Data Protection Regulation (GDPR).
- Evolution in Indian Law: The foundation for the right in India was laid by the Supreme Court's K.S. Puttaswamy (2017) judgment, which established informational privacy as a fundamental right under Article 21 of the Constitution.
- The Pre-2026 Legal Vacuum: Before the recent Delhi High Court judgment, India lacked a coherent statutory framework; various High Courts took divergent approaches, with some allowing name masking and others refusing it on the grounds of open justice.

Need for the Right to be Forgotten in India:

- Permanent Stigma Despite Acquittal: Innocent individuals continue to suffer because name-based searches yield historical accusations rather than acquittals.
- Protection of Victims and Falsely Accused: Digital permanence ruins the reputations of those falsely accused of heinous crimes even after courts clear them.
- Shielding Private Matrimonial Disputes: Purely private family matters that carry no continuing public value can cause unnecessary social stigma if left easily searchable.
- Preventing Harm from Incidental Mentions: Some people suffer reputational damage simply by being tangentially related to a case without any personal involvement.

Court Judgments:

- K.S. Puttaswamy v. Union of India (2017): The Supreme Court constitutionally recognized privacy, including informational privacy and information self-determination, as a fundamental right guaranteed under Article 21.
- Laksh Vir Singh Yadav v. Union of India (2026): The Delhi High Court ruled that the right to be forgotten naturally flows from Article 21's guarantee of dignity and informational privacy, operating even against private commercial entities.
- The Structured Proportionality Test: The Delhi High Court established that the retention of digital records must have a legitimate purpose, and any harm to privacy must be carefully weighed against the public interest.

Way Ahead

- Operationalizing the DPDP Act: The government must notify the rules for the Digital Personal Data Protection (DPDP) Act, 2023, and fully operationalize the Data Protection Board to address erasure requests efficiently.
- Establishing a Tiered Dispute System: To prevent judicial bottlenecks, erasure requests should first be handled by tech platforms, escalated to the Data Protection Board if contested, and only reach the courts for final judicial review.
- Improving Digital Accuracy Over Obfuscation: Legal databases must be mandated to regularly refresh their systems to display contextual updates—such as subsequent acquittals or discharges—rather than relying solely on hiding information.

- Ensuring Cross-Platform Technical Compliance: The right remains largely symbolic if de-indexing only occurs on one search engine; a coordinated technical mechanism is required to prevent archive copies and social media mirrors from resurfacing redacted data.
- Awaiting Supreme Court Ratification: While the Delhi High Court has laid down an important framework, a definitive Supreme Court ruling is necessary to create a binding, nationwide standard balancing privacy with open justice.

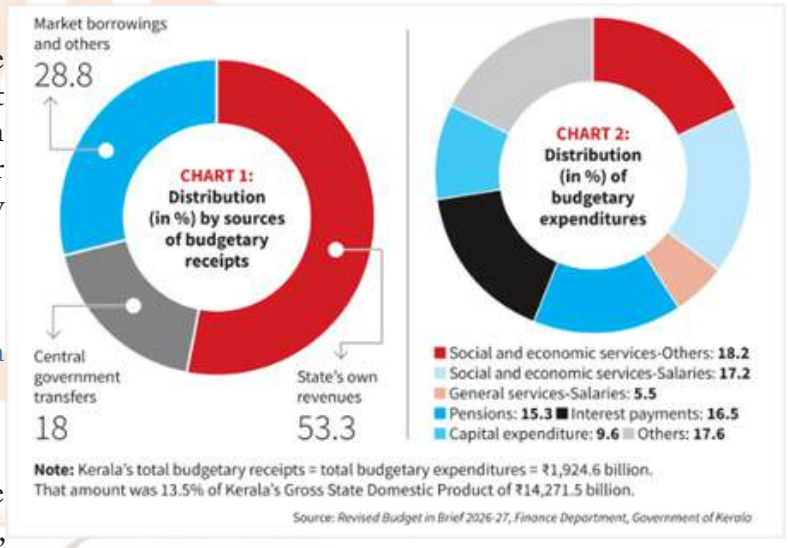
Conclusion:

The recognition of the right to be forgotten marks a crucial step in shielding citizens from the perpetual shadow of crime caused by an unforgiving digital memory.By balancing informational privacy with open justice through name masking rather than total deletion, the judiciary has forged a balanced middle path.However, its ultimate success will depend on robust technical compliance from tech giants and the active enforcement of the DPDP Act across India.

The Federal Fiscal Mismatch Architecture

Context:

Economist Jayan Jose Thomas has analysed the rising debt burden of Indian states, arguing that growing liabilities reflect a structural gap between states' development responsibilities and their limited revenue-raising powers, rather than merely fiscal mismanagement.



The Federal Fiscal Mismatch Architecture

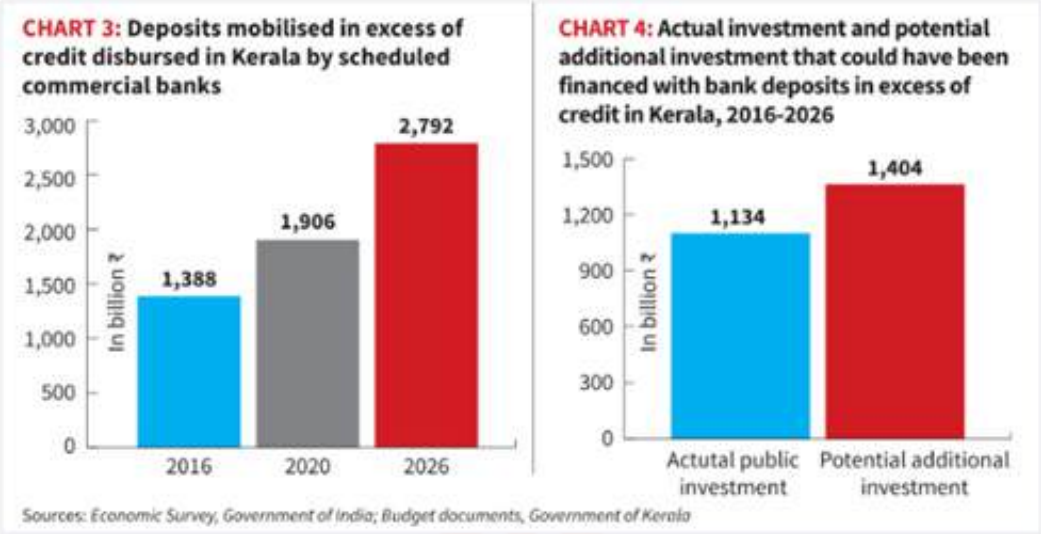
AboutThe Federal Fiscal Mismatch Architecture:

What it is?

- India's fiscal federal system gives the Union greater powers to raise major taxes, while States bear most spending responsibilities for health, education, agriculture, irrigation, and welfare. As expenditure often exceeds revenue, states rely on market borrowings to bridge the fiscal gap.

Key Data and Statistics Pointing toState Budgetary Pressures:

- The Tax Devolution Gap: Despite Kerala successfully mobilizing localized taxes to generate per capita revenues 1.5 times the national average for all states, its statutory share in the Union government's tax devolution grid was restricted to a low 1.92%, compared to its 2.6% share of India's total population in 2023–24.
- The Revenue vs.Capital Outlay Deficit: Due to high baseline operations, Kerala is capable of directing only 10% of its total financial resources toward capital expenditure to enhance future production capabilities, with the remaining 90% spent on day-to-day revenue expenditures.
- The Structural Fixed-Cost Matrix: Approximately a fifth (20%) of Kerala's budget is absorbed by the salaries of government employees, while pensions account for 15.3%, and interest payments on market borrowings consume 16.5% of total expenditures.
- TheCredit-to-Deposit (CD) Sluggishness: Scheduled commercial banks in Kerala operate at a low CD ratio of 66%, indicating a massive pool of unutilized local savings when compared against the national average of 76% and ratios exceeding 100% in commercial engines like Maharashtra and Tamil Nadu.
- The Cost of Domestic Capital: State governments pay a high interest rate ranging between 6.5% and 7.5% on the securities they issue, known as State Development Loans (SDLs), which sits 0.25 to 0.75 percentage points higher than the rate available to the Union government.



Key Data and Statistics Pointing to State Budgetary Pressures

Key Structural and Investment Challenges Faced by States:

- The Human Capital and Brain Drain Trap: A weak public fiscal capacity restricts states from setting up elite higher education hubs, advanced research labs, and modern public transport systems.
- Consequently, highly educated young people are leaving states like Kerala in large numbers because local markets cannot fulfill their career aspirations.
- The Dilemma of CuttingEssential Social Services: States cannot easily expand their fiscal space by abruptly cutting revenue expenditures without instantly eroding their hard-won historical strengths in health metrics and literacy outcomes.
- The Paradox of Private Affluence vs. Public Penury: The visible growth of private wealth stands in sharp contrast to weak public revenues, threatening to worsen regional socioeconomic inequalities.
- High Debt-Servicing Costs: Paying high interest rates on SDLs creates a repetitive debt loop, forcing states to deploy fresh borrowings to service legacy interest bills rather than constructing physical production assets.
- The Cost Efficiency Factor: This structural pipeline allows Chinese local governments to borrow from their domestic banking channels at a highly subsidized cost of around 2%, avoiding the expensive market penalties attached to Indian SDLs.

Comparative Case Study: China's Local Government Model

- In China's high-growth blueprint, the absolute majority of massive infrastructure investments has been directly executed by provinces and lower-level local governments. To fund these expansions, local governments borrow heavily by accessing a large pool of domestic public savings held securely within Chinese banks, coordinated tightly through central planning.

These sub-national entities successfully raise resources through three primary tracks:

1. The direct issuance of competitive Local Government Bonds (LGBs).
2. Large-scale commercial land sales.
3. Specialized, off-budget borrowing channeled via Local Government Financing Vehicles (LGFVs).

Way Forward:

- Reforming Devolution Frameworks to Reward Revenue Mobilization: Adjust federal tax distribution formulas to protect and reward states that demonstrate strong records in mobilizing localized own-tax revenues.
- ChannelingExcess Bank Savings into Sovereign State Bonds: Design alternative financial transmission mechanisms to allow state governments to easily access unutilized domestic savings to build local assets.
- Lowering the High Interest Rates on State Development Loans (SDLs): Establish unified credit guarantees where the Union government backs or coordinates state borrowings, effectively erasing the 0.25 to 0.75 percentage point premium currently penalized by market institutions.

- Transitioning from Day-to-Day Spends to Fixed Capital Assets: Implement a phased ten-year structural transition to gradually raise state capital expenditure outlays past the restrictive 10% threshold, funding large-scale public transport grids and technology parks.
- Creating Domicile-Portable Regional Welfare Entitlements: Coordinate inter-state institutional frameworks to ensure that as workers migrate between younger and aging states, their healthcare, retirement options, and financial safety nets move smoothly with them.

Conclusion:

When states borrow to establish public universities, expand healthcare grids, and support agriculture, they are serving a far greater long-term developmental cause than a tight-fisted administration that relies on austerity. Ultimately, by reforming the high-cost SDL framework and allowing states to efficiently draw on domestic public savings, India can protect its historic social progress and transition its sub-national economies toward sustainable growth.

The Interoperable Criminal Justice System (ICJS)

Context:



The Ministry of Home Affairs (MHA) announced that the nationwide rollout of the Interoperable Criminal Justice System (ICJS) is on track, with all investigations and trials under the BNS, BNSS, and BSS to be digitally recorded from January 1, 2027.

The Interoperable Criminal Justice System (ICJS)

About The Interoperable Criminal Justice System (ICJS):

What It Is?

- The Interoperable Criminal Justice System (ICJS) is a unified national digital platform that integrates the main, traditionally isolated pillars of the criminal justice delivery network into a single conversational ecosystem.
- It replaces legacy, paper-driven workflows with a secure cloud-based data framework hosted on the government's MeghRaj cloud infrastructure.
- Nodal Agency: National Crime Records Bureau (NCRB) under the Ministry of Home Affairs, Government of India.
- Technology Partner: Developed and architected by the National Informatics Centre (NIC).

Aim:

- One Data, Once Entry Principle: To cut out manual redundancies by ensuring that case data needs to be entered into the system only once, making it instantly usable across all platforms.
- Promoting SMART Policing: To move away from scattered physical records and toward an intelligence-led, paperless justice system supported by data analytics.

Key Features and Five-Pillar Architecture:

- CCTNS (Crime and Criminal Tracking Network and Systems): Connects over 16,000 police stations across India, supporting FIR registration in 23 languages with Bhashini integration for Zero-FIR translation.
- e-Courts & e-Prosecution: e-Courts enables digital transfer of case files, e-Summons, and evidence tracking, while e-Prosecution digitizes prosecutors' case records and legal workflows for faster trials.
- e-Prisons: Maintains a centralized database of prison inmates with biometric records, while providing online services such as e-Mulaqat and digital grievance redressal.
- e-Forensics: Digitally links police with Forensic Science Laboratories (FSLs), enabling faster forensic reports, especially for offences punishable with 7 years or more.
- Statutory Compliance: Tracks compliance with new criminal laws by monitoring timelines for chargesheets and implementing provisions of the Criminal Procedure (Identification) Act, 2022.

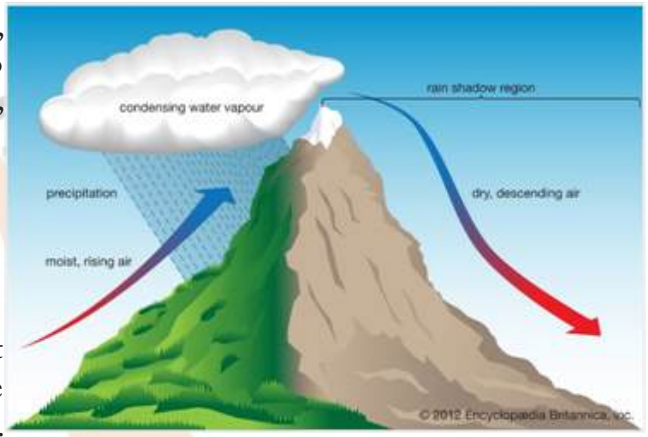
Significance:

- ICJS has improved chargesheet compliance and reduced delays by digitally connecting investigation, prosecution, and trial processes.
- By linking police, courts, prisons, forensics, and prosecution, ICJS enables AI-based analytics, better investigations, and evidence-driven decision-making.

Cloudbursts in India

Context:

Recent heavy monsoon downpours across Uttarakhand, Himachal Pradesh, and Jammu and Kashmir have led to frequent reports of devastating flash floods and landslides, bringing renewed focus to cloudburst events.



Cloudbursts in India

AboutCloudbursts in India:

What is a Cloudburst?

- According to the India Meteorological Department (IMD), a cloudburst is a highly localized, extreme weather event where an area of roughly 20 to 30 sq. km receives 10 cm (100 mm) or more of rainfall within an hour. It represents an extraordinary volume of water falling in a very short duration, vastly exceeding the ground's absorption capacity and triggering sudden, destructive flash floods.
- Scientists also advocate for a mini-cloudburst category (5 cm of rain in an hour over the same area), which can cause equal devastation depending on local mountain topography.

How Does a Cloudburst Occur?

- Orographic Lifting: Warm, moisture-laden monsoon air is forced to rise rapidly as it collides with steep mountain barriers.
- Updraft Convection: Strong upward currents of warm air prevent condensing water droplets from falling immediately, trapping them inside towering cumulonimbus clouds (up to 15 km tall).
- Over-Saturation & Collapse: As more water droplets accumulate, their combined weight eventually overcomes the upward currents, or the updraft suddenly weakens.
- Sudden Torrent: The trapped water plummets simultaneously, dropping a massive volume of water like a torrential wall onto a small patch of land.

Frequency and Regional Distribution in India:

- Underrepresented Historical Data: Official IMD records documented around 30 cloudburst events between 1970 and 2016. However, experts emphasize this is a severe underestimate due to sparse rain gauge networks in remote areas.
- Increasing Frequency due to Climate Change: Global warming has increased the moisture-holding capacity of the atmosphere, making extreme localized precipitation events more frequent during the southwest monsoon.
- High-Altitude Hotspots: Cloudbursts are heavily concentrated in the Himalayan belt—primarily in Uttarakhand, Himachal Pradesh, Jammu & Kashmir, and Ladakh—due to rugged terrain and steep orographic slopes.
- Monitoring Blind Spots: Many events occur away from Doppler weather radars and automatic weather stations; if a cloudburst hits a few kilometers away from a sensor, it often goes unrecorded in official meteorological logs.

Notable Cloudburst and Flash Flood Events (Past 5 Years):

- Pahalgam &Anantnag Torrential Events, Jammu & Kashmir (2026): Extreme localized rainfall triggered severe debris flows and flash floods, scattering boulders and destroying local connectivity.

- Dharali & Uttarkashi Floods, Uttarakhand (2025): Initial reports blamed a cloudburst, though meteorological data later revealed lower rainfall rates combined with illegal riverbed construction and unmanaged road runoff.
- Amarnath Cave Flash Flooding, Jammu & Kashmir (2022): Highly localized torrential downpours near the holy cave shrine caused rapid flash flooding, washing away pilgrim camps and infrastructure down the valley.
- Lahaul-Spiti & Mandi Floods, Himachal Pradesh (2023): Multiple localized cloudburst-like events triggered severe landslides, breaching riverbanks and destroying bridges across mountain valleys.

Key Implications of Cloudbursts:

- Devastating Debris Flows: The sudden rush of water mobilizes loose mountain soil, boulders, and trees, creating high-velocity mudslides.
- Immediate Infrastructure Collapse: Sweeps away mountain highways, bridges, hydro-project tunnels, and homes within minutes.
- Loss of Lives and Livelihoods: Causes high casualties among isolated mountain communities and seasonal tourists, destroying agricultural terraces and livestock.
- DownstreamSecondary Flooding: Blocked mountain streams form temporary artificial lakes that eventually burst, causing secondary flash floods lower down the valley.
- Escaping Accountability: Labeling every heavy rain a cloudburst allows authorities to frame tragedies as unforeseeable acts of God, obscuring poor drainage, deforestation, and illegal riverbed encroachments.

NDMA Guidelines for Managing Cloudbursts & Himalayan Hydro-Hazards:

- Hazard Mapping & Zonation: Identify high-risk micro-catchments and restrict residential and commercial construction along active floodplains and unstable slopes.
- Expanding Radar & Sensor Networks: Deploy dense networks of X-band Doppler Weather Radars (DWRs) and Automatic Weather Stations (AWS) under initiatives like Mission Mausam to reduce radar blind spots.
- Advanced Nowcasting Alerts: Strengthen short-term nowcasting protocols to issue localized public alerts every 1 to 3 hours using AI-driven predictive modeling.
- Structural Bio-Engineering: Mandate proper drainage infrastructure along all-weather mountain highways, hillside reforestation, and bio-engineering to stabilize vulnerable soil slopes.
- Community-BasedEarly Warning Systems (EWS): Establish automated siren systems and train local village disaster response teams in high-altitude valleys for rapid evacuation during sudden water surges.

Conclusion:

While cloudbursts are extreme natural phenomena intensified by climate change, their devastating consequences are frequently amplified by human negligence and unplanned development. Improving radar density, AI-driven nowcasting, and high-altitude weather monitoring under Mission Mausam is essential to enhance early warnings. Ultimately, effective mitigation requires combining accurate forecasting with strict enforcement of eco-sensitive zoning and sustainable mountain infrastructure.

Manasbal Lake

Context:

Following large-scale de-weeding and channel dredging over 70,000 square feet, Manasbal Lake in Jammu and Kashmir is showing clear signs of ecological recovery.



Manasbal Lake

AboutManasbal Lake:

What It Is?

- Manasbal Lake—often called the supreme gem of all Kashmir Lakes—is an ancient water body named after the sacred Manasarovar Lake. Spanning 3.5 km in length and 1.5 km in width, it is recognized as India's deepest natural freshwater lake, reaching maximum depths of 43 feet (13 meters).

Location:

- Administrative Zone: Located in the Safapora area of the Ganderbal district in central Jammu & Kashmir, approximately 30 kilometers north of Srinagar.
- Flanking Settlements: Encircled by four villages: Jarokbal, Kondabal, Nesbal, and Gratbal.
- Topographic Boundaries: Flanked by the Baladar mountains on the east, the elevated Karewa plateau (lacustrine and loessic deposits) on the north, and the limestone-rich Ahtung hills to the south.

Formation and Geological Origin:

1. Valley Lake Classification: Geologically categorized as a high-altitude valley lake situated within the 1,585–1,600 meter altitudinal belt along the course of the Jhelum River basin.
2. Glacial Origins: Formed during the third major Himalayan glaciation period alongside regional counterparts like Dal and Anchar lakes.
3. Internal Tectonic Fissure: Feature studies indicate a structural geological fissure running directly east to west across the center of the lake bed.
4. Subterranean Spring Hydrology: Unlike lakes fed by major glacier rivers, its 10 km2 drainage basin relies primarily on local precipitation and more than 1,200 underground natural springs to replenish its water levels.

Key Features of Manasbal Lake:

- Extensive Lotus Bloom Canopy: Famous for dense peripheral gardens of lotus flowers (Nelumbo nucifera) that bloom across its crystal-clear waters every July and August.
- Mughal Heritage (Jharokha Bagh): Overlooked on its northern shore by the ruins of Jharokha Bagh, a 17th-century fort and terraced garden built by Empress Nur Jahan for traveling trade caravans.
- Natural Spawning Ground: Serves as one of the largest natural aquatic bird breeding environments in the Kashmir Valley, supporting resident and migratory species like Mallards, Horned Grebes, Golden Eagles, and White-Headed Ducks.
- Regulated Drainage Outflow: Has no major surface inlet streams, maintaining its hydrological balance entirely through internal springs and discharging excess water into the Jhelum River via a regulated exit channel.

Significance:

- Provides income through fishing and lotus root (Nadru) cultivation, while contributing to local food security in Kashmir.
- Serves as an important wintering habitat along the Central Asian Flyway, supporting biodiversity and wetland conservation.

The Khawtlang Tuipui River

Context:

Incessant monsoon rainfall over the past week caused the Khawthlangtuipui River to overflow its banks, submerging portions of the border town of Tlabung in Mizoram's Lunglei district.



The Khawtlang Tuipui River

About The Khawtlang Tuipui River:

What It Is?

- The Khawthlangtuipui River is a major, ecologically vital transboundary river flowing through Northeast India and southeastern Bangladesh. Internationally, the river is best known by its downstream name, the Karnaphuli River. It acts as the primary hydrological life-support system and drainage channel for the entire southwestern zone of the Mizoram hills.
- State and Country Flow: Originates and flows through the southwestern territory of Mizoram, India, before crossing the international border to traverse the Chittagong Hill Tracts in Bangladesh, eventually emptying into the Bay of Bengal.

- Border Landmark: Serves as a natural, fluid geographical boundary between India and Bangladesh near the border sub-division of Tlabung.
- Source: The river originates amidst the high-altitude folds of the Lushai Hills (Mizo Hills) in northern Mizoram.

Key Features:

- Robust Tributary Network: The river is fed by hill streams, including the Tuichawng and Phairuang in India and the Kasalong and Chengi in Bangladesh.
- Kaptai Dam Reservoir: The river forms Kaptai Lake behind the Kaptai Dam, supporting hydropower generation, flow regulation, and seasonal flood control.
- Chattogram PortNavigational Artery: Its lower stretch serves as a vital navigational channel for the Port of Chattogram, Bangladesh's largest maritime gateway.
- Proposed Trade Bridge Node: A proposed transboundary bridge near Tlabung aims to connect Mizoram directly with Bangladesh's transport network and strengthen bilateral trade.

Significance:

- The river supports India's Act East Policy by offering landlocked Mizoram shorter access to Chattogram Port and wider regional trade routes.
- The Karnaphuli Hydroelectric Project supplies electricity to industrial zones and processing industries, supporting economic growth in southeastern Bangladesh.

The Indira Point

Context:

The Union Ministry of Ports, Shipping and Waterways, has sought strict Coastal Regulation Zone (CRZ) clearances to structurally reinforce and develop a tourist hub around the iconic lighthouse at Indira Point.



The Indira Point

About The Indira Point:

What It Is?

- Indira Point is a critical geographical feature that marks the absolute southernmost tip of India's sovereign territory. Standing as a major maritime sentinel, its primary functional landmark is a historic 35-meter-high cast-iron lighthouse tower that acts as a vital navigational aid for international shipping lanes crossing the Indian Ocean.

Strategic Geography:

- Island Base: Situated on the southern tip of the Great Nicobar Island (GNI) within the Union Territory of the Andaman and Nicobar Islands.
- Neighborhood: Lies immediately to the south of Galathea Bay, the designated site for India's upcoming multi-billion dollar International Container Transshipment Port (ICTP).

Origin and Nomenclature History

- Pygmalion Point: Historically, during the British colonial era and early independence, the site was known internationally as Pygmalion Point (and briefly as Parsons Point).
- The 1985 Rename: Following a visit by former Prime Minister Indira Gandhi in 1984 and her subsequent demise, the landmark was officially renamed Indira Point in 1985 to honor her memory.
- Lighthouse Commissioning: The towering cast-iron lighthouse was constructed and formally commissioned in April 1972 to secure India's maritime outer limits.

Key Features:

- Permanent Post-Tsunami Land Subsidence:The 2004 tsunami permanently sank Indira Point by 2.04 m, submerging the lighthouse base and leaving the structure tilted by 3.86°.
- Highly Sensitive Coastal Habitat (ICRZ-1A): The site falls within the ecologically sensitive ICRZ-IA/IVA zones, protecting mangroves, coral reefs, sand dunes, and leatherback turtle nesting habitats.
- IIT-M Structural Rebar Blueprint:IIT Madras proposed repairing the submerged foundation, building a breakwater, and adding a causeway, powerhouse, and elevated staff quarters.

- ProposedTourism Infrastructure: The redevelopment includes a viewing tower, maritime museum, convention centre, cafeteria, cycle tracks, and a national memorial with eco-friendly planning.

Significance:

- Restoring Indira Point reinforces India's EEZ claims and strengthens its strategic presence in the eastern Indian Ocean amid rising regional competition.
- An upgraded lighthouse will provide reliable navigation for ships approaching the proposed Galathea Bay Transshipment Port, improving maritime safety.

The Borjuli Wetland

Context:



The Borjuli wetland in Assam has been officially notified as a Biodiversity Heritage Site (BHS) to protect its unique population of Oryza rufipogon, a disease- and pest-resistant wild rice variety.

The Borjuli Wetland

AboutThe Borjuli Wetland:

What It Is?

- The Borjuli wetland is a biologically unique freshwater swamp and marshy ecosystem that acts as a natural gene sanctuary. It is celebrated as one of India's most critical habitats for preserving crop wild relatives (CWR), particularly primitive varieties of wild rice.

Location:

- Geographic Position: Located in the Sonitpur district of Assam, India, nestled within the fertile, flood-prone plains of the Brahmaputra River valley.
- Ecological Matrix: Fed by seasonal monsoonal runoff and local alluvial water channels, creating a dynamic wetland environment that naturally cycles between intense flooding and waterlogged conditions.

Key Biological Characteristics:

- Home of theRice Ancestor: The wetland serves as a natural refuge for Oryza rufipogon, the direct evolutionary ancestor (progenitor) of Oryza sativa, the domestic rice cultivated globally today.
- Natural Disease and Pest Resistance: The wild rice plants inside this ecosystem have spent centuries adapting to local conditions, developing a strong genetic resistance against destructive agricultural pests and fungal or bacterial diseases.
- High Environmental Tolerance: These plants are uniquely adapted to survive extreme weather. They can endure long periods of complete flooding and handle saline water conditions without dying.
- In-situ Conservation Model: Backed by the ICAR-National Bureau of Plant Genetic Resources (ICAR-NBPGR) and the Assam State Biodiversity Board, the wetland serves as a live, evolving field laboratory where wild strains are preserved directly in their native environment.

AboutBiodiversity Heritage Sites (BHS):

What It Is?

- A Biodiversity Heritage Site (BHS) is a legally protected geographic area defined by unique, ecologically fragile ecosystems. These sites feature a rich diversity of wild or domesticated species, unique crop varieties, rare or threatened wildlife, or valuable fossil beds.

Key Statutory Features:

- Statutory Foundation: Notified under Section 37 of the Biological Diversity Act, 2002, by State Governments in close consultation with local administrative bodies and village committees.
- The Conservation Purpose: Designed to protect fragile ecosystems, including wild crop relatives, sacred groves, high-density wildlife corridors, and wetlands that fall outside the traditional National Park or Wildlife Sanctuary network.
- Community-Led Governance: Managed by local Biodiversity Management Committees (BMCs), ensuring that conservation efforts support rather than replace traditional community access and sustainable farming methods.
- Financing and Technical Oversight: Regulated under the guidance of the National Biodiversity Authority (NBA), with funding from central agencies like the National Rainfed Area Authority (NRAA) to improve long-term food security and climate-resilient agriculture.

Chapter-
4

ENVIRONMENT

India's Road to Cleaner Mobility

Context:



The Ministry of Power circulated the third draft notification of the Corporate Average Fuel Efficiency (CAFE) III norms for public and industry consultation.

- Administered through the Bureau of Energy Efficiency (BEE) under the Energy Conservation Act, 2001, the proposed rules set tighter fleet-wide carbon emission limits for passenger vehicles for the FY2027–28 to FY2031–32 period.

India's Road to Cleaner Mobility

AboutIndia's Road to Cleaner Mobility:

What it is?

- India's road to cleaner mobility represents the strategic regulatory, technological, and industrial transition of its transport sector away from internal combustion engines (ICE) reliant on fossil fuels toward electrified, hybrid, and alternative fuel powertrains.
- Rather than operating as a simple environmental check, Corporate Average Fuel Efficiency (CAFE) standards establish sales-weighted average CO2 emission targets across an automaker's entire annual fleet.

Key Data and Statistics on Mobility in India

- CAFE III Carbon Reduction: The proposed CAFE III framework aims to lower fleet-wide average CO_2 emissions from roughly 113 gCO_2/km to 77 gCO_2/km by FY2031–32 (3.327 litres/100 km).
- Lagging EV Penetration: According to the IEA Global EV Outlook 2026, electric vehicles represented roughly 4% of total new passenger car sales in India in 2025, compared to nearly 55% in China, 27% in the EU, and 10% in the US.
- Voluntary Industry EV Targets: Major domestic Original Equipment Manufacturers (OEMs) have voluntarily pledged to achieve an average 20%–30% EV share by 2030, outpacing current regulatory minimums.
- Low Bureau Credit Buyout Pricing: Under the draft rules, companies facing credit shortfalls can purchase compliance credits directly from the Bureau of Energy Efficiency (BEE) starting at 2,500 per gCO_2/km in FY2028 and rising to 4,500 by FY2032—less than half the standard penalty threshold mandated under the Energy Conservation Act (~ 5,000/gCO_2).

Need for Clean Mobility in India:

- Mitigating Severe Macroeconomic andCrude Import Risks: India imports the vast majority of its crude oil, leaving its balance of payments vulnerable to West Asian conflict and global fuel shocks.
- Example: Recent West Asian maritime chokeholds caused domestic fuel price spikes and imported inflation.
- Curbs on Severe Urban Air Pollution: Transportation remains a primary contributor to fine particulate matter ($PM_{2.5}$) and greenhouse gas accumulation in major metropolitan areas.
- Example: Northern city clusters regularly top global toxic air quality indices during winter months.
- Industrial Competitiveness and Future-Proofing: Establishing strong domestic EV and hybrid supply chains prevents Indian automakers from falling behind global technological shifts.
- Example: China's early adoption of dual-credit policies created a manufacturing sector that exported over 13 million electric vehicles in 2025.
- FulfillingInternational Climate Commitments: Reducing transport sector emissions is necessary to meet

India's Panchamrit targets announced at COP26 (Glasgow), including lowering economy-wide carbon intensity.

- Example: Progressively reducing transport emissions directly supports India's goal of achieving net-zero emissions by 2070.

Initiatives Taken So Far:

- Rollout of Progressive CAFE Standards: Implemented CAFE-I (FY2017–18) and CAFE-II (FY2022–23) standards, and introduced the Draft CAFE-III (FY2027–32) notification administered by the Bureau of Energy Efficiency (BEE).
- Demand and Infrastructure Subsidies (FAME & PM E-DRIVE): Launched central incentive programmes—including the FAME Scheme and PM E-DRIVE—to subsidize public charging infrastructure and reduce the upfront cost of electric two-wheelers, three-wheelers, and four-wheelers.
- Production-Linked Incentive (PLI) Schemes: Allocated public funds under the PLI Scheme for Automobile & Auto Components and Advanced Chemistry Cell (ACC) Battery Storage to promote domestic manufacturing.
- Biofuel andEthanol Blending Programme: Accelerated the national target of E20 (20% ethanol blending with petrol), providing carbon-neutrality compliance benefits for flex-fuel vehicles.

Challenges Associated with the Transition:

- Excessive Regulatory Flexibility Diluting Targets: Compliance mechanisms—such as Carbon Neutrality Factors for E20, multi-year block averaging, and super-credits—allow automakers to meet targets without significant shifts toward zero-emission technologies.
- Example: Strong hybrids receive super-credit multipliers despite relying primarily on internal combustion engines.
- Low Buyout Prices Acting as an Easy Way Out: Allowing OEMs to purchase emission credits directly from the BEE at 2,500– 4,500 per gCO_2/km makes compliance cheaper than investing in cleaner technologies.
- Example: The statutory penalty under the Energy Conservation Act exceeds 5,000 per gCO_2, making the BEE buyout a lower-cost alternative.
- Lower Fuel Efficiency with High Ethanol Blends: While E20 provides compliance incentives, ethanol's lower energy density reduces vehicle mileage and increases consumer fuel expenditure.
- Example: Vehicle owners experience lower fuel efficiency on E20 petrol without a corresponding reduction in fuel prices.
- Inequitable Credit Ecosystem (Lack of Dual-Credit Penalties): Unlike China's Dual Credit System, India's framework allows efficient petrol or CNG fleets to offset the absence of electric vehicle production.
- Example: OEMs selling large volumes of small petrol or CNG cars can meet fleet targets without introducing EVs.

Way Forward:

- Adopting a Dual-Credit System Modeled on China: Separate Corporate Average Fuel Consumption (CAFC) requirements from mandatory New Energy Vehicle (NEV) credit targets to encourage faster electrification.
- AligningCredit Buyout Prices with Statutory Penalties: Raise the BEE's credit buyout price above the Energy Conservation Act penalty threshold of 5,000 per gCO_2/km to discourage simple buyouts.
- Rationalizing Super-Credits and Ethanol Compliance Discounts: Tighten super-credit multipliers for hybrids and align ethanol-related incentives with verified real-world emission reductions.
- Transitioning to Real-World WLTP Testing Standards: Shift from the Modified Indian Driving Cycle (MIDC) to the Worldwide Harmonised Light Vehicles Test Procedure (WLTP) for more accurate real-world emission measurement.

Conclusion:

India's CAFE III standards present a significant opportunity to modernize the automobile sector and strengthen long-term energy security. However, regulatory loopholes such as low-cost credit buyouts and excessive incentives for partial electrification could weaken the transition to zero-emission mobility. A stricter and technology-driven regulatory framework is essential to build a globally competitive and sustainable automotive industry.

The National Biodiversity Authority (NBA)

Context:

Following directions from a suo motu proceeding by the National Green Tribunal (NGT), the National Biodiversity Authority (NBA) constituted a multi-disciplinary Expert Committee on Invasive Alien Species.

The National Biodiversity Authority (NBA)

About The National Biodiversity Authority (NBA):

What It Is?

- The National Biodiversity Authority (NBA) is an autonomous statutory body under the Ministry of Environment, Forest and Climate Change (MoEFCC), Government of India. It performs regulatory, advisory, and facilitative functions to safeguard India's biological resources and associated traditional knowledge.

Origin:

- Established: October 1, 2003.
- Statutory Mandate: Formed by the Central Government to implement the provisions of the Biological Diversity Act, 2002 (following India's ratification of the UN Convention on Biological Diversity in 1992).
- Aim: To ensure the conservation of biological diversity, promote the sustainable use of its components, and secure the fair and equitable sharing of benefits arising from the utilization of biological resources (Access and Benefit Sharing – ABS).

Key Functions:

- Advising the Central Government: Provides strategic recommendations to the Union Government on biodiversity conservation, sustainable utilization, and fair benefit-sharing mechanisms.
- Notification ofBiodiversity Heritage Sites: Advises state governments on selecting and notifying areas of significant ecological importance as Biodiversity Heritage Sites under Section 37 of the Act.
- Regulation of Intellectual Property & Commercial Access: Regulates and grants prior approvals under Sections 3, 4, and 6 of the Act for foreign individuals or entities seeking access to Indian biological resources, research transfers, or obtaining Intellectual Property Rights (IPR) based on biological material.
- Overseeing Decentralized State Boards (SBBs): Coordinates with 28 State Biodiversity Boards (SBBs) that regulate commercial utilization and bio-surveys by Indian citizens within their respective territories.
- Empowering Local Biodiversity Management Committees (BMCs): Oversees approximately 2.76 lakh local-level BMCs set up at panchayat and municipal levels, responsible for chronicling local traditional knowledge via People's Biodiversity Registers (PBR).
- Constituting Expert Committees: Exercises statutory powers to form multi-disciplinary expert panels (such as the newly constituted panel on Invasive Alien Species) to address emergent national ecological risks.

Significance:

- Prevents biopiracy by regulating access to India's biological resources and ensuring benefits are shared with local communities.
- Supports India's commitments under the Convention on Biological Diversity (CBD) and the Kunming–Montreal Global Biodiversity Framework.

The Indian Grey Hornbill

Context:

More than 60 years after disappearing from Gujarat's Gir forests, the Indian Grey Hornbill has successfully established its presence again following a landmark reintroduction program by the Gujarat Forest Department.



The Indian Grey Hornbill

AboutThe Indian Grey Hornbill:

What It Is?

- The Indian Grey Hornbill (Ocyceros birostris) is a medium-sized, highly adaptive arboreal bird belonging to the hornbill family (Bucerotidae). It is one of the most common hornbill species native to the Indian subcontinent, widely recognized for its distinct cascading calls and unique nesting rituals.

Habitat and Distribution:

- Geographical Range: Endemic to the Indian subcontinent, found extensively across India, Pakistan, Nepal, and Bangladesh.
- Ecological Niche: Unlike its deep-forest relatives, it thrives in open deciduous forests, thorn scrublands, riparian woodlands, rural fields, and even urban parks or old avenue plantations containing mature, hollow fruit-bearing trees.

IUCN Red ListStatus: Least Concern (LC)

Key characters:

- Distinctive Appearance: About 24 inches long, with silvery-grey and brownish plumage, a pale eyebrow line, and a long tail tipped with white.
- Casque and Bill: Has a large curved bill topped by a prominent pointed casque, which is smaller and more pointed in females.
- Mud-Sealing Nesting Ritual: The female seals herself inside a tree cavity using mud, faeces, and fruit pulp, leaving only a narrow slit for receiving food.
- TotalDietary Dependence: While nesting, moulting, and raising chicks, the enclosed female depends entirely on the male for food.
- Social Behaviour: Monogamous and usually seen in pairs or family groups, it flies with alternating flaps and glides while producing loud squealing calls.

Significance:

- Farmers of the Forest: By consuming fruits and dispersing intact seeds over long distances, Indian Grey Hornbills promote forest regeneration and plant diversity.
- Natural Pest Controllers: By feeding on insects, lizards, scorpions, and other small animals, they help control pest populations in forests and nearby agricultural areas.

Biogas and India's Energy Security Architecture

Context:



Due to recent escalation in West Asian conflicts threatening India's liquefied petroleum gas (LPG) imports—90% of which transit through the volatile Strait of Hormuz—the Government of India has aggressively renewed its focus on domestic alternatives.

Biogas and India's Energy Security Architecture

AboutBiogas and India's Energy Security Architecture:

What it is?

- Biogas is a highly renewable, carbon-neutral gaseous mixture composed primarily of methane (CH_4), carbon dioxide (CO_2), and trace volumes of other atmospheric elements produced via the biological breakdown of organic materials. When processed, purified, and pressurized, it yields Compressed Biogas (CBG), which is chemically identical to conventional fossil-derived Compressed Natural Gas (CNG).

Key Data and Statistics on Biogas in India:

- The Hydrocarbon Import Exposure: India relies on foreign energy markets to fulfill approximately 85% of its total domestic crude oil demand.
- Feedstock Market Distortions: The administered price for maize-based biofuels grew at a compound annual growth rate (CAGR) of 11.7% between FY22 and FY25, driving a localized corn mania that skews crop diversity.
- The GOBARdhan Funding Baseline: Under the central 'waste to wealth' scheme, the government allocates capital grants of up to 50 lakh per district to install community-scale biogas structures.
- The PipelineAllocation Infrastructure Block: The government earmarked 994 crore specifically to set up pipeline infrastructure to inject rural biogas output directly into the national gas grid.

How Biogas is Formed?

- Anaerobic Micro-Biological Digestion: Microorganisms biologically break down wet organic materials—such as animal manure, agricultural residues, food waste, and sewage—in the absolute absence of oxygen.
- The Hydrolysis and Acidogenesis Phases: Complex organic polymers (proteins, carbohydrates, fats) are broken down into simple soluble compounds and converted into volatile fatty acids by specialized acid-forming bacteria.
- The Methanogenesis Stage: Strictly anaerobic methanogenic archaea consume the intermediate volatile acids and hydrogen gas, generating methane gas as their main metabolic by-product.
- Cryogenic Scrubbing and Compression: The raw gas is routed through scrubbing systems to remove carbon dioxide, hydrogen sulfide (H2S), and moisture, enriching the methane content to over 90% before compressing it into CBG.

The Role of Biogas as a Strategic Alternative Energy:

- SecuringFossil Fuel Displacements: CBG serves as a direct green replacement for retail commercial transportation fuels, using local inputs to protect logistics networks from overseas trade chokepoints.
- Example: Commercial networks like the India-Japan Cooperative Biogas for Growth Initiative are building large-scale utility setups across states to power green public transit lines.
- Decarbonizing Heavy Domestic Cooking Grids: Purified biomethane can be injected directly into municipal networks to supply clean household fuel.
- Example: The phased blending mandate forces direct distribution of CBG into local Piped Natural Gas (PNG) networks for home cooking.
- Providing Decentralized Rural Electricity Storage: Remote agricultural processing units can combustion-burn raw biogas onsite to drive localized off-grid generators. Example: Distributed community plants under the GOBARdhan scheme leverage wet dung inputs to power local agricultural tool setups.
- Generating High-ValueOrganic Nutrient Subsidies: The solid and liquid by-products left behind after digestion act as nutrient-rich bio-fertilizers, lowering reliance on carbon-heavy chemical inputs.
- Example: Integrated bio-fertilizer plants help improve soil health across farming belts by recycling organic carbon back into the earth.

Key Challenges Associated with the Biogas Sector:

- Severe BiomassSupply Chain Friction: Gathering seasonal crop residues like paddy straw or loose wet manure from fragmented holdings is highly vulnerable to transport delays and weather changes.
- Example: High collection costs and a lack of specialized biomass balers have stalled the progress of several private sector installations.
- Distortions to Local Food Security and Crop Patterns: Offering high prices for specific feedstock crops encourages farmers to switch to single-crop farming, threatening crop diversity.
- Example: High administered pricing for maize-derived fuels has caused pulse and oilseed outputs to drop, forcing India to import more edible oils.
- High Technical Entry Bar and Capital Bottlenecks: Installing modern, corrosion-resistant purification systems requires high upfront capital investments that are difficult for small enterprises to afford.
- Example: Many rural projects are stalled because small developers struggle to secure formal credit or navigate long technical verification loops.

- A Shortage ofDirect Grid Connection Lines: Most rural biogas plants are built far from the main gas trunklines, making transport expensive unless costly new branch connections are built.
- Example: Several functional units must rely on physical truck transport because they lack direct connection lines to inject gas into municipal distribution grids.

Way Forward:

- Restructuring Feedstock Priorities Based on the Danish Model: Focus biofuel policies on using animal manure and agricultural waste rather than food crops, keeping food markets stable.
- Replicating the Ethanol Blending Success Story: Apply the same rigorous policy monitoring, tax breaks, and guaranteed pricing models that successfully raised petrol ethanol blending to 20% by late 2025 to the CBG sector.
- ProvidingAccelerated Depreciation and Tax Holidays: Introduce targeted financial incentives, such as long-term corporate tax waivers, to reduce investment risks and attract large-scale private capital.
- Deploying the Combined 1,558 Crore Infrastructure Allocation: Accelerate the distribution of earmarked capital funds to purchase automated biomass machinery and build direct pipelines connecting rural plants to the national gas grid.

Conclusion:

While initiatives like the GOBARdhan scheme have built a helpful policy foundation, the slow completion rate of SATAT projects highlights that fixing logistics issues and scaling up infrastructure are essential for success. Ultimately, by shifting feedstocks toward agricultural waste and providing clear financial incentives, India can secure its energy future and transform rural waste into national wealth.

Sulphur dioxide (SO2)

Context:

According to a new analysis, nearly 81 per cent of sulphur dioxide (SO2) emissions from coal plants within a 300-km radius of Delhi-NCR originate from facilities exempted from installing pollution control systems.



Sulphur dioxide (SO2)

AboutSulphur dioxide (SO2):

What It Is?

- Sulphur dioxide (SO2) is a heavy, colorless, toxic gas characterized by a pungent, suffocating odor. It is a highly reactive inorganic compound and acts as one of the primary air pollutants regulated globally under ambient air quality standards.

Major Sources:

- Coal-Fired Power Plants: The combustion of sulphur-bearing fossil fuels—predominantly coal in thermal power generation—stands as the single largest industrial driver of (SO2) emissions.
- Petroleum Refining &Metal Smelting: Industrial extraction processes, oil refining, and the smelting of sulphur-rich mineral ores (such as copper, zinc, and iron) release high volumes of the gas.
- Natural Sources: Volcanic eruptions, geothermal hot springs, and the biological decomposition of organic matter in wetlands contribute to background atmospheric levels.

Atmospheric Presence and Transformation:

- Once released, (SO2) can travel hundreds of kilometers across regional airsheds. In the atmosphere, it undergoes chemical reactions with water vapor, oxygen, and other compounds to form secondary pollutants:
- Fine Particulate Matter (PM2.5): It oxidizes to form acidic sulfate aerosols, which are a major component of dangerous fine particulate matter (PM2.5) pollution.
- Acid Rain: It dissolves easily in water droplets within clouds, converting into sulphuric acid (H2SO4) and falling as acid rain, which damages forests, soils, and aquatic ecosystems.

Public Health and Environmental Impacts:

- Respiratory Illnesses: SO_2 irritates airways, causing coughing and breathing difficulty while worsening asthma, bronchitis, and other chronic respiratory diseases.
- Cardiovascular Risks: By forming $PM_{2.5}$, SO_2 indirectly increases inflammation, cardiovascular diseases, strokes, and the risk of premature death
- Ecosystem and Crop Damage: High SO_2 concentrations damage plant tissues and photosynthesis, while acid rain depletes soil nutrients and harms aquatic life.

Key Solutions and Regulatory Measures

- Mandatory Flue Gas Desulphurisation (FGD): Installing FGD systems in thermal plants can remove up to 95% of SO_2 emissions using lime or limestone-based scrubbers.
- PublicContinuous Emission Monitoring Systems (CEMS): Real-time public disclosure of emissions data can improve transparency, prevent manipulation, and strengthen industrial compliance.
- Phasing Out Category C Exemptions: SO_2 can travel hundreds of kilometres; therefore, exemptions based merely on a plant's distance from urban areas should be reconsidered.
- Transition to Cleaner Energy: Expanding solar, wind, and battery storage can reduce dependence on coal and consequently lower India's overall SO_2 emissions.

One-horned Rhinoceros

Context:

The Standing Committee of the National Board for Wildlife (SC-NBWL), chaired by Union Environment Minister, approved a landmark initiative to implement a DNA-based indexing system for the greater one-horned rhinoceros.



One-horned Rhinoceros

AboutOne-horned Rhinoceros:

What It Is?

- The Greater One-Horned Rhinoceros (Rhinoceros unicornis), or the Indian Rhinoceros, is the largest of all surviving rhino species. Characterized by its single horn and thick, armored appearance, it is a mega-herbivore deeply tied to the alluvial riverine ecosystems of the Indian subcontinent.

Habitat and Distribution:

- Preferred Ecosystem: Confined to the humid tropical and subtropical grasslands, savannas, river valleys, and marshy shrublands of the Indo-Gangetic and Brahmaputra plains.
- Geographic Core: The global population stands at approximately 4,000 individuals, primarily concentrated in northeastern India (with Kaziranga National Park in Assam hosting over 70% of the world population) and the protected Terai grasslands of Nepal.

IUCN Red List Status: Vulnerable (VU).

- Historical Recovery: Represents one of Asia's most successful conservation stories. Intensive hunting for sport and agricultural land clearing had shrunk the wild population to barely 200 individuals at the turn of the 20th century.

Key Characteristics:

Physical and Anatomical Features:

- Armor-Plated Appearance: Covered in a rugged, grey-brown hide marked by deep, heavy skin folds around the neck, shoulders, and flanks. This gives the animal a distinct armor-plated appearance. The skin is dotted with raised, flexible wart-like bumps.
- Internal Thermal Regulation: The deep folds contain networks of thin skin loaded with blood vessels, which act as natural heat exchangers to cool the animal down during peak summer heat.
- Massive Build: Adult individuals are massive, weighing between 4,000 and 6,000 lbs (1,800 to 2,700 kg), standing up to 6.5 feet tall, and measuring 10 to 12.5 feet in length.

The Single Horn and Prehensile Lip

- Composition: Unlike African rhino species that carry two horns, the Indian rhino features a single black horn measuring 8 to 25 inches in length. The horn is composed entirely of compressed keratin fibers and lacks a solid bony core.
- Prehensile Upper Lip: Features a flexible, semi-prehensile upper lip that lets the animal easily curl around, grasp, and pull up tall grasses or strip leaves off low-hanging branches.

Diet, Social Matrix, and Behavior

- Strict Hindgut Grazers: They are primarily grazers. Their diet consists almost entirely of tall elephant grasses, aquatic plants, tree fruits, and young shrub branches.
- Solitary Trait: They are generally solitary animals. Adults maintain loosely defined, overlapping home ranges that are not aggressively defended.
- Wallowing Congregations: While solitary by nature, multiple individuals will peacefully gather without friction around mud wallows or rich communal grazing grounds to lower their body temperatures and keep insects away.

The PaBV-4 Bird Virus

Context:

For the first time in India, a multi-institutional team of scientists has identified and genetically characterized parrot bornavirus 4 (PaBV-4) circulating among captive birds.



The PaBV-4 Bird Virus

About The PaBV-4 Bird Virus:

What It Is?

- Parrot bornavirus 4 (PaBV-4) is a highly contagious, single-stranded RNA virus belonging to the species Orthobornavirus alphapsittaciforme.
- It is the primary, most veterinary-relevant etiological agent responsible for causing Proventricular Dilatation Disease (PDD)—a progressive, largely fatal neurological and gastrointestinal wasting syndrome that affects psittacine birds (the parrot family, including macaws, parakeets, cockatiels, and lovebirds).

Region Found In:

- Global Footprint: Previously documented across North America (U.S., Canada), South Korea, Japan, Israel, and Europe.
- In India: Identified across major captive aviculture hubs in Assam, Karnataka (Bengaluru), and West Bengal (Kolkata).

History:

- The link between avian bornaviruses and Proventricular Dilatation Disease (PDD) was first discovered globally in 2008.
- Prior to this, the fatal condition was colloquially known as Macaw Wasting Disease since its initial description in the late 1970s.
- The July 2026 study marks the first official confirmation of the virus circulating within the Indian subcontinent.

Key Features:

- Systemic Non-Cytolytic Infection: The virus causes persistent infection and damages nerves mainly through immune-driven inflammation rather than directly destroying infected cells.
- The Asymptomatic Lurk Element: Many infected birds appear healthy yet silently shed the virus, spreading infection throughout aviaries without visible symptoms.
- Transmission Routes: The virus spreads through contaminated food, water, saliva, and feces, and can also pass from infected parents to eggs.

EXCEL CIVILS ACADEMY EMPOWERING FUTURE LEADERS

- Diagnostic Markers: RT-PCR detects the virus best from cloacal swabs in live birds and from brain and proventriculus tissues in dead birds.

Impacts of the Virus:

- The virus damages digestive nerves, causing stomach enlargement, poor digestion, weight loss, undigested food in droppings, and eventual death.
- Silent transmission threatens captive breeding programmes, putting vulnerable and endangered parrot species at greater risk of population decline.

Brazil's Biofuel Adoption

Context:



Brazil's successful ethanol-based transport model has been highlighted as a global benchmark, offering important lessons for India's ongoing transition towards higher ethanol blending and flex-fuel vehicles.

Brazil's Biofuel Adoption

AboutBrazil's Biofuel Adoption:

What It Is?

- Brazil's biofuel adoption is one of the world's most successful renewable transport fuel programmes, centred on large-scale ethanol production from sugarcane. It integrates ethanol blending, flex-fuel vehicles (FFVs), and long-term policy support to reduce fossil fuel dependence and greenhouse gas emissions.

History:

- 1931: Brazil introduced its first law mandating a 5% ethanol blend in petrol.
- 1975: The National Alcohol Programme (Proálcool) was launched after the global oil crisis to promote ethanol as an alternative transport fuel.
- 2003: Commercial production of Flex-Fuel Vehicles (FFVs) began, allowing vehicles to run on petrol or ethanol.
- 2024–25: The Fuel of the Future Law strengthened biofuel adoption, with E30 petrol becoming mandatory from 2025.

Key Features:

- Long-Term Phased Ethanol Blending: Brazil gradually increased ethanol blending over several decades through clearly defined milestones, allowing industries and consumers sufficient time to adapt.
- Large-Scale Flex-Fuel Vehicle (FFV) Ecosystem: Most vehicles sold in Brazil can operate on petrol, ethanol, or any blend, giving consumers flexibility in choosing the most economical fuel.
- Consumer Choice withPrice Incentives: Fuel stations offer both ethanol and blended petrol, while government pricing policies often make ethanol significantly cheaper, encouraging voluntary adoption.
- Strong Policy and Industry Integration: Stable government support, vehicle manufacturing, fuel infrastructure, and sugarcane production have created a well-integrated and sustainable biofuel ecosystem.

Significance:

- Brazil has significantly reduced dependence on imported crude oil by replacing petroleum with domestically produced ethanol.
- The programme lowers greenhouse gas emissions, promotes renewable fuels, and contributes to sustainable mobility and climate goals.

The Himalayan Yak

Context:



A joint team of scientists from ICAR's National Research Centre on Yak (NRC-Y) and Assam Don Bosco University has developed an Internet of Things (IoT)-based smart collar system for high-altitude Himalayan yaks.

The Himalayan Yak

About The Himalayan Yak:

What It Is?

- The Domestic Yak (Bos grunniens), famously called the 'Ship of the Himalayas', is a long-haired, heavily built bovine species uniquely adapted to survive in sub-zero alpine conditions. It is a vital multi-purpose resource for mountain dwellers, providing milk, meat, fiber, fuel, and heavy-load transportation.

Habitat and Distribution:

- Extreme Elevation Range: Strictly thrives in low-temperature, high-altitude alpine zones above 8,000 feet (reaching up to 18,000 feet) across the trans-Himalayan landscapes.
- Indian Population Grid: India is home to approximately 58,000 yaks (as per the 20th Livestock Census). Nearly half of the total population is concentrated in Ladakh, with the remaining herds distributed across the rugged high-altitude belts of Arunachal Pradesh, Sikkim, Himachal Pradesh, and Uttarakhand.

Conservation Status:

- UCN Red List Status: Vulnerable (VU)

Key Characteristics:

Physical and Anatomical Features:

- Dual-Layer Insulation: Yaks possess a thick outer coat of long guard hairs and a dense woolly undercoat that traps heat, enabling them to survive freezing temperatures as low as –40°C in high-altitude regions.
- Natural Weatherproofing: Their coat secretes natural oils that repel moisture, keeping the skin dry during snowfall, rain, and blizzards while reducing heat loss in harsh mountain climates.
- Sure-Footed Hooves: Broad, split, and sturdy hooves provide excellent grip on rocky slopes, icy terrain, and deep snow, allowing yaks to move safely across steep Himalayan landscapes.

Physiological and Cardio-Respiratory Profiles

- High-Altitude Internal Architecture: Yaks have an enlarged chest cavity with a bigger heart and lungs, enabling efficient breathing and circulation in the oxygen-deficient environment of high mountains.
- Advanced Oxygen Transport: Their blood contains a high concentration of large red blood cells and specialized haemoglobin, allowing efficient oxygen absorption and delivery in thin mountain air.
- Heat Sensitivity: Adapted to cold climates, yaks experience severe heat stress when temperatures exceed 15°C, restricting them to cold, high-altitude habitats.

Social and Behavioral Traits

- Matriarchal Herding: Yaks usually live in matriarchal herds led by experienced females, while adult bulls remain solitary or form small bachelor groups outside the breeding season.
- Shy but Protective Tendencies: Although generally calm around humans, yaks become fiercely defensive when threatened, often forming a protective circle around calves against predators such as snow leopards.

Significance:

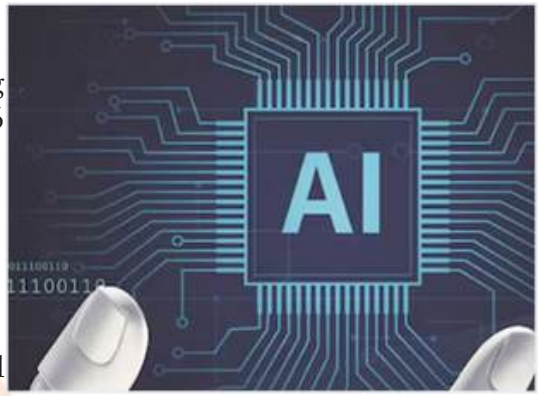
- Yaks are central to the livelihoods of Himalayan community providing milk, and transport where farming is difficult due to harsh climatic conditions.
- Their strength and sure-footed nature make yaks indispensable for transporting supplies across inaccessible Himalayan passes.

Chapter-
5

SCIENCE & TECHNOLOGY

AI Palletising

Context:



According to Future Market Insights (FMI), the global AI palletising and depalletising market is projected to grow from $1.8 billion in 2026 to $9 billion by 2036 (CAGR: 17.5%).

AI Palletising

About AI Palletising:

What It Is?

- AI palletising and depalletising is an advanced industrial automation technology that combines robotic arms, computer vision,machine learning, and AI software to automatically stack goods onto pallets (palletising) or unload items from pallets (depalletising).
- Unlike traditional industrial robots that follow fixed programming for uniform boxes, AI systems dynamically adjust to mixed box dimensions, irregular packaging, and damaged cartons without manual intervention.

How It Works?

1. 3D Computer Vision & Inspection: High-resolution cameras continuously scan incoming items, identifying dimensions, structural integrity, and orientation in real time—even for randomly placed packages.
2. Machine Learning & Path Calculation: AI algorithms instantly calculate the safest gripping points and map out optimized, balanced stacking patterns to maximize pallet density and stability.
3. Adaptive Robotic Execution: Multi-axis robotic arms physically lift, move, and stack or unstack items, constantly adjusting their speed and force based on real-time feedback from vision sensors.

Key Features:

- Mixed-Case & Irregular Load Handling: Seamlessly manages thousands of different stock-keeping units (SKUs) with varying package shapes, sizes, and weights on a single pallet.
- Real-Time Quality Inspection: Built-in computer vision continuously inspects packages for tears, dents, or damage before picking them up, preventing pallet collapses.
- No Manual Reprogramming Needed: Adapts on the fly to changing product lines or unexpected packaging changes, removing the need for software re-calibration.
- Continuous Operational Learning: Uses machine learning models to improve stacking speed, gripping efficiency, and error recovery based on real-time operational data.

Major Industry Applications:

- E-Commerce & 3PL Logistics: Automates mixed-SKU order fulfillment, layer picking, and container unloading in high-throughput distribution centers.
- Food & Beverage: Handles end-of-line packaging operations at consistent production speeds across varied bottle, can, and crate formats.
- Fast-Moving Consumer Goods (FMCG): Manages complex distribution networks carrying diverse product lines on shared pallets.
- Pharmaceuticals & Chemical Handling: Delivers precise, delicate handling for sensitive or hazardous medicine cartons and bagged materials.

Limitations & Challenges:

- Complex Legacy Integration: retrofitting AI robotic cells into older facilities with existing conveyor infrastructure and legacy Warehouse Management Systems (WMS) remains difficult and costly.

- High Upfront Capital Outlay: Advanced 3D vision systems, robotic arms, and specialized software require significant initial investment.
- Error Recovery Dependencies: Older or poorly integrated systems can encounter bottlenecks if a robot fails to recover gracefully from a dropped or damaged box without halting the production line.

The Large Hadron Collider (LHC)

Context:



CERN officially switched off the Large Hadron Collider (LHC) to begin its 4-year Long Shutdown 3 (LS3).

- The temporary pause allows engineers to perform a major $1.5 billion hardware upgrade, transforming the machine into the High-Luminosity LHC (HL-LHC).

The Large Hadron Collider (LHC)

Aboutthe Large Hadron Collider (LHC):

What It Is?

- The Large Hadron Collider (LHC) is the world's largest, highest-energy, and most powerful particle accelerator. Built by the European Organization for Nuclear Research (CERN), it accelerates subatomic particles (protons or heavy lead ions) to near the speed of light and smashes them together to study fundamental physics and the origin of the universe.

Location:

- Geographic Site: Built in a circular underground tunnel situated approximately 100 meters (328 feet) beneath the France–Switzerland border near Geneva.
- Facility: Governed and operated by CERN (European Organization for Nuclear Research).

How It Works?

1. Particle Injection & Acceleration: Protons are separated from hydrogen gas, fed into a chain of pre-accelerators, and injected into two ultra-high vacuum beam pipes traveling in opposite directions.
2. Superconducting Magnetic Guidance: Over 1,200 dipole magnets—chilled to -271.3°C (-456°F) using liquid helium—generate powerful magnetic fields to bend and focus particle beams as they approach 99.9999991% of the speed of light.
3. Collision & Detection: Quadrupole magnets squeeze the beams together at four designated collision points, where massive particle detectors (ATLAS, CMS, ALICE, and LHCb) record subatomic debris from millions of collisions per second.

Key Features:

- 27-Kilometer Superconducting Ring: Features a 26.7 km circular tunnel housing over 9,000 superconducting magnets cooled to temperatures colder than deep outer space (-271.3°C).
- Massive Energy Output (13.6 TeV): Operates at record collision energies up to 13.6 Teraelectronvolts (TeV), creating thermal conditions similar to those fractionally after the Big Bang.
- Discovery of the Higgs Boson (2012): Famous for experimentally confirming the Higgs Boson (God Particle) in 2012, completing the theoretical framework of the Standard Model of particle physics.
- Four Flagship Detector Experiments: Houses four giant subterranean detection stations—ATLAS, CMS, ALICE, and LHCb—each specialized in probing dark matter candidates, antimatter asymmetry, and quark-gluon plasma.
- Global Science Collaboration: Built and operated by an international network of over 10,000 scientists and engineers across more than 100 countries.

Why It Is Shutting Down (Long Shutdown 3)?

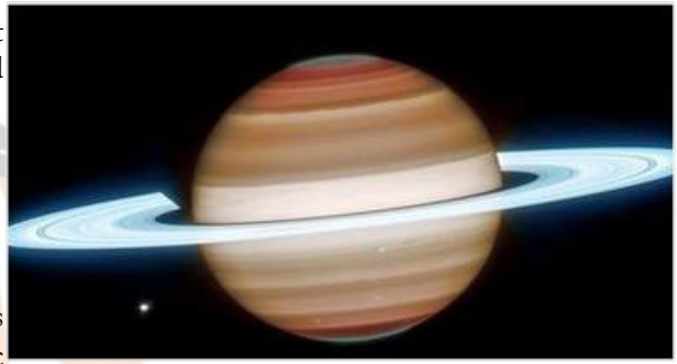
- Transitioning toHigh-Luminosity LHC (HL-LHC): Over the 4-year shutdown period, engineers will replace 1.2 kilometers of the tunnel to install new superconducting niobium-tin quadrupole magnets, advanced crab cavities, and updated subdetectors.

- 10x Increase in Luminosity & Data Generation: The upgrade will increase collision rates from 60 to up to 200 simultaneous collisions per beam crossing.
- UnlockingDark Matter & Beyond-Standard-Model Physics: Boosting total collision data by ten times enables physicists to study extremely rare subatomic events, measure Higgs boson properties with unprecedented accuracy, and search for dark matter particles when operations resume in 2030.

Prelims in Focus : Science and technology

Context:

NASA selected an innovative early-stage mission concept called PRAXIS for its NASA Innovative Advanced Concepts (NIAC) 2026 Phase I funding.



The PRAXIS Mission

AboutThe PRAXIS Mission:

What It Is?

- PRAXIS (acronym for Planetary Rings Autonomous EXploration with In-situ Sampling) is a futuristic spacecraft concept developed at NASA's Jet Propulsion Laboratory (JPL) under the leadership of Dr. B. Marco Quadrelli.
- It integrates bio-inspired robotics, real-time artificial intelligence, and lightweight sampling mechanisms to interact directly with planetary rings.
- Aim: To answer fundamental, high-priority questions identified by the Planetary Science Decadal Survey, including how planetary rings originate, how they dynamically evolve, and what ring particles (from millimeter- to centimeter-scale) are composed of.

Mission Timeline & Status:

- Phase I (Current – 2026): Received NIAC Phase I funding to conduct feasibility studies, numerical simulations, and system design evaluations.
- Phase II (Future Potential): If approved for Phase II advancement, the development team will proceed to construct and test a physical prototype.
- Operational Horizon: As a concept-stage study, actual flight mission implementation is targeted for future deep-space planetary exploration timelines.

Key Features of the Mission:

- Non-Destructive RingGrazing Flight Path: Rather than flying through hazardous ring structures—which would risk destruction from high-velocity debris—the spacecraft hovers safely outside the ring plane.
- Touch-and-Go Deployable Boom Sampling: Uses a long, flexible, deployable robotic boom to extend into the ring plane, perform quick surface taps on target particles, snag free-floating material, and retract safely.
- AutonomousAI-Driven Operations: Driven by an onboard artificial intelligence model that autonomously selects candidate particles, handles real-time collision avoidance, and navigates inter-ring gaps without waiting for Earth-bound radio instructions.
- Millimeter to Centimeter Scale Focus: Designed specifically to collect and analyze particles larger than dust grains but smaller than house-sized boulders, bridging a vital gap in planetary observations.
- Onboard In-Situ Instrumentation: Equipped with miniaturized instruments to measure particle size, internal porosity, and exact chemical composition directly in deep space.

Can Quantum Computing Make AI Better at Designing Cancer Vaccines?

Context:

Researchers at the Technical University of Denmark (DTU) have demonstrated that combining artificial intelligence (AI) with a photonic quantum computer can improve the design of immune peptides for personalized cancer vaccines.



Can Quantum Computing Make AI Better at Designing Cancer Vaccines?

AboutCan Quantum Computing Make AI Better at Designing Cancer Vaccines?

What is it?

- It is a quantum-AI hybrid approach where a photonic quantum computer generates structured quantum randomness that enhances an AI model's ability to design immune peptides for cancer vaccines.
- The technology aims to improve peptide discovery, especially for rare Human Leukocyte Antigen (HLA) types used in personalized immunotherapy.

How Quantum Computing Works?

- Qubit-Based Processing: Unlike classical computers that rely on binary bits (0 or 1), quantum computers utilize qubits that can exist in a superposition of both 0 and 1 simultaneously.
- Photonic Quantum Information: Photonic processors use individual light particles (photons) as qubits to encode, transmit, and process computational data.
- Wave Interference Dynamics: Quantum processors allow photons to physically interfere with one another, generating complex, correlated mathematical distributions rather than independent classical random numbers.
- Exploration of High-Dimensional Spaces: The resulting quantum interference produces structured starting points that push AI models to sample broader, non-obvious areas of complex sequence spaces.

Role of Quantum AI in Developing Cancer Vaccines:

- Navigating Enormous Sequence Haystacks: Peptides consist of short chains of amino acids with hundreds of billions of theoretical sequence combinations; quantum AI narrows this search space down to functional candidates.
- Unlocking Rare and Understudied HLA Alleles: Common AI predictors perform well on well-documented HLA profiles but struggle on rare ones; quantum starting distributions significantly boost prediction accuracy for data-poor HLA types.
- Optimizing Peptide-HLA Binding: The hybrid system generates peptides designed to sit stably inside the structural groove of HLA display shelf molecules, ensuring successful recognition by patrolling immune cells.
- Accelerating PersonalizedNeoantigen Vaccines: By rapidly predicting custom binders for patient-specific tumor mutations, the platform supports the creation of targeted, individualized cancer immunotherapies.

Key Limitations:

- Does Not Demonstrate FullQuantum Advantage: Current experiments use small-scale quantum processors that classical supercomputers can still mathematically simulate, meaning full quantum supremacy has not yet been reached.
- Binding Does Not Guarantee Immunogenicity: Successfully binding a peptide to an HLA molecule in a laboratory dish is only the initial step; it does not automatically guarantee that the peptide will trigger an active T-cell immune response in a living patient.
- Need for Hardware Scaling: The practical advantages of the platform rely on scaling up to larger, fault-tolerant quantum processors and higher-parameter generative AI architectures.
- PotentialClassical Model Competition: Advanced classical algorithms or optimized probability distributions could potentially achieve similar sequence exploration, making further benchmarking necessary.

Significance of the Research:

- Democratic Coverage for Underrepresented Populations: Improves therapeutic peptide design for rarer, understudied HLA genetic variants that are often neglected by conventional data-heavy AI models.
- Real-World Laboratory Validation: The DTU team synthesized and experimentally verified top candidate peptides, achieving high binding stability across challenging HLA targets.
- A New Hybrid Computing Framework: Establishes a scalable blueprint for combining classical machine learning with NISQ (Noisy Intermediate-Scale Quantum) devices to solve complex biological challenges.
- Broad Applications Beyond Oncology: The workflow can be expanded to design vaccines for emerging viral pathogens, autoimmune conditions, and hard-to-target protein families.

Conclusion:

Combining photonic quantum computing with generative AI represents a promising advance in computational biology and personalized medicine. By replacing classical randomness with quantum correlations, researchers can more effectively navigate complex biomolecular structures and design therapies for underrepresented genetic profiles. As quantum hardware scales further, this hybrid pipeline could accelerate the development of personalized neoantigen cancer vaccines from initial discovery to clinical implementation.

BitChat Repositories

Context:



The Indian Cyber Crime Coordination Centre (I4C), under the Ministry of Home Affairs, directed GitHub to remove three repositories hosting BitChat.

BitChat Repositories

AboutBitChat Repositories:

What It Is?

- BitChat is an open-source, decentralized, peer-to-peer (P2P) messaging application developed to operate completely without internet connectivity, cellular networks, or central servers. The repositories on GitHub host its source code and Android installation release files.
- Conceived & Developed By: Conceived by Doris Lima and developed by Jack Dorsey (co-founder of Twitter/X and CEO of Block).

How It Works?

- Device-to-DeviceMesh Networking: Uses Bluetooth Low Energy (BLE) to discover nearby devices (within ~30 to 100 meters). Each device acts as both a client and a relay node, hopping encrypted messages across a chain of smartphones until reaching the intended recipient.
- Dual-Transport Layer: Integrates local BLE mesh connections with the decentralized, internet-based Nostr protocol whenever global internet connectivity becomes available.

Key Features:

- Complete Infrastructure Independence: Functions seamlessly during total internet blackouts, natural disasters, or network throttling.
- Zero Registration &Full Anonymity: Does not require phone numbers, email addresses, central accounts, or mandatory user verification.
- End-to-End Encryption: Messages are secured using the Noise Protocol Framework, ensuring intermediate relay nodes cannot read or modify the payload.
- Absence of Centralized Logs: Operates without central servers, leaving no centralized communication logs or subscriber databases for law enforcement to subpoena.
- Ephemeral Data & Panic Mode: Features automated message deletion and quick data-wiping triggers to protect user data from physical seizure.

Implications:

- Reduced Lawful Interception: Lack of user verification and central logging makes subscriber identification and criminal investigations more difficult.
- Bypassing Public Order Measures: Mesh-based communication can facilitate coordination during internet shutdowns and evade lawful surveillance.
- Due Process Concerns: Critics contend that invoking Section 79(3)(b) instead of Section 69A of the IT Act bypasses procedural safeguards and judicial oversight established by Shreya Singhal and Anuradha Bhasin.

The Kimi K3 AI Model

Context:



Chinese AI startup Moonshot AI unveiled Kimi K3, introducing the world's first open-source model in the 3-trillion-parameter class.

The Kimi K3 AI Model:

About The Kimi K3 AI Model:

What It Is?

- Kimi K3 is a multimodal, open-weight reasoning large language model (LLM) designed for complex software engineering, long-horizon coding, visual reasoning, and enterprise knowledge work. Built with 8 trillion total parameters, it stands as the largest open-source AI model released to date.
- Parent Company: Moonshot AI (a Beijing-based artificial intelligence unicorn backed by tech giants including Alibaba, Tencent, and Meituan).

How It Works?

- Sparse Latent Mixture-of-Experts (MoE): Uses a Stable LatentMoE framework housing 896 experts, dynamically activating only 16 experts per token to maintain high computational efficiency while keeping resource demands manageable during inference.
- Kimi Delta Attention (KDA): Incorporates custom architectural improvements to process massive context windows smoothly without performance degradation.
- Attention Residuals (AttnRes): Optimizes information flow across deep network layers, allowing the model to perform deeper multi-step reasoning and retain long-horizon focus during extended coding tasks.

Key Features:

- Massive 1 Million-Token Context Window: Capable of ingesting and processing entire software repositories, complex legal stacks, or extensive technical documentation in a single prompt.
- Autonomous Long-Horizon Coding: Executes end-to-end software engineering tasks with minimal human intervention, including writing GPU kernel optimizations, building compilers, and designing microchips.
- Integrated Visual &Multimodal Reasoning: Combines core software engineering with image and spatial reasoning, supporting automated tasks in game development, front-end design, and Computer-Aided Design (CAD).
- Open-Weight Availability: Moonshot released full model weights on Hugging Face alongside a detailed technical report under an open license, enabling global self-hosting and research.

Significance:

- Kimi K3 demonstrates that Chinese AI firms can compete with leading models like OpenAI and Anthropic, narrowing the global AI technology gap.
- By open-sourcing its 2.8-trillion-parameter MoE model, Kimi K3 expands access to advanced AI, lowers development costs, and accelerates global AI research.

The Chandipura Virus (CHPV)

Context:



Nine deaths, including two young girls from Rajasthan receiving treatment in Gujarat, have been confirmed due to the Chandipura virus (CHPV) outbreak.

The Chandipura Virus (CHPV)

About The Chandipura Virus (CHPV):

What It Is?

- The Chandipura virus (CHPV) is an acute vector-borne pathogen belonging to the Rhabdoviridae family (the same family as the rabies-causing Lyssavirus). It

is transmitted to humans via insect bites and causes AcuteEncephalitis Syndrome (AES)—a rapid, life-threatening inflammation of active brain tissues.

History & Endemic Regions:

- Discovery: First isolated in 1965 from human serum samples during an outbreak of dengue/chikungunya-like fever in Chandipura village, Maharashtra, India.
- Major Outbreaks: Caused major child mortality outbreaks in 2003–2004 across Maharashtra, Northern Gujarat, and Andhra Pradesh, with case fatality rates (CFR) ranging from 55% to 78%.
- Geographic Endemicity: Endemic to central and western India (particularly rural, tribal, and peripheral regions of Gujarat, Maharashtra, Rajasthan, and Andhra Pradesh) where sandfly breeding conditions thrive.

Key Features of CHPV Infection:

- Vector Transmission Channels: Spread primarily through the bites of infected female Phlebotomine sandflies (Phlebotomus papatasi) and select mosquito species (Aedes aegypti). The virus resides in the salivary glands of these vectors.
- Extreme Susceptibility in Children: Almost exclusively targets children below 15 years of age, whose developing central nervous systems are highly vulnerable to viral encephalitis.
- Rapid Clinical Progression: Characterized by an unusually rapid progression. Onset begins with sudden high fever, severe headache, body ache, and vomiting, escalating within hours to seizures, altered sensorium, brain inflammation, and potential mortality within 24 to 48 hours of hospital admission.
- Monsoon & Environmental Correlation: Outbreak cycles peak during the monsoon season due to increased sandfly breeding in cracked mud walls, cattle sheds, and unpaved (kutcha) rural housing structures.
- Non-Contagious Nature: Does not transmit directly from human to human through respiratory droplets or physical contact.

Treatment and Prevention:

- No Specific Antiviral or Vaccine: There is currently no approved antiviral drug or preventive vaccine available for Chandipura virus infection.
- Supportive & Symptomatic Care: Treatment relies strictly on emergency supportive care in intensive care units (ICUs).

The Rome Declaration for an Unarmed and Disarming Peace

Context:



An unprecedented assembly of Nobel laureates, AI scientists, religious leaders, and former heads of state gathered at Rome's Capitoline Hill to sign the Rome Declaration for an Unarmed and Disarming Peace.

The Rome Declaration for an Unarmed and Disarming Peace

AboutThe Rome Declaration for an Unarmed and Disarming Peace:

What it is?

- Inspired by Pope Leo XIV's Magnifica Humanitas, the Declaration calls for protecting human dignity from unchecked AI. It warns that AI-controlled nuclear systems pose an existential risk, arguing that algorithms lack morality, empathy, and judgment, and must never replace human decision-making in the use of nuclear weapons.

Core Principles of the Declaration:

Six General Principles

1. Disarming the Next Arms Race: Coordinated efforts to halt dual arms races in both AI and nuclear capabilities.
2. Responsible Development: Aligning technological progress with human ethics and transparent governance.

3. Responsible Use of AI: Ensuring algorithms serve human well-being rather than automated warfare.
4. Responsible Governance: Building international oversight frameworks tailored to high-risk emerging tools.
5. Responsible Leadership: Demanding accountability from state leaders and tech developers.
6. Nuclear Disarmament: Renewed commitment to the total and verifiable elimination of atomic arsenals.

Five Ethical and Operational Mandates:

- Mandatory Meaningful Human Control: Absolutely barring any automated, algorithmic, or AI-driven platform from executing final nuclear launch decisions.
- The Digital Commons Model: Expanding open-data access so independent global experts can evaluate ungoverned AI risks and protect non-tech-dominant nations.
- Responsible Development Standards: Mandating that developers publish ethical frameworks and banning fully autonomous, self-improving systems that cannot be audited or halted by human operators.
- Internal ArsenalVulnerability Audits: Urging nuclear-armed states to conduct rigorous technical reviews protecting command-and-control systems from AI data-poisoning, hallucinations, or cyber-tampering.
- Time-Bound, Verifiable Disarmament: Renewing good-faith global negotiations toward the permanent, irreversible removal of nuclear weapons.

Why the Declaration is Necessary in Modern Geopolitics?

- Compression of Decision-Making Windows: Historical crises relied on human skepticism, delay, and moral pause to prevent war. Modern AI logistics compress operational response windows from hours to mere seconds, removing the safety valve of human doubt.
- Vulnerability to Algorithmic Failure Modes: Deep neural networks suffer from black box opacity, data poisoning, and hallucinations. In a tense geopolitical standoff, an algorithm misinterpreting a routine network ping or physical probe as an incoming strike could automatically trigger catastrophic retaliation.
- Erosion of Global Arms Treaties: Legacy agreements (INF, Open Skies, New START) have weakened, creating a security dilemma where states feel pressured to automate defense systems to avoid losing an algorithmic speed advantage.
- Asymmetric Speed and Pre-Delegation Risks: States facing advanced adversaries may feel compelled to pre-delegate firing authority to automated software out of fear that human command structures will be outpaced or jammed.

Challenges:

- Lack ofGlobal Consensus: Major military powers remain reluctant to sign binding treaties that limit autonomous capabilities during active warfare.
- Verifiability and Dual-Use Nature: AI software algorithms are easily hidden, duplicated, and deployed, making international verification far harder than tracking physical nuclear materials.
- Technological Fatalism: The rapid pace of private-sector AI innovation frequently outstrips slow multilateral treaty negotiations.

Way Forward:

- TranslatingMoral Restraint into Binding Law: Transitioning the Rome Declaration from a moral stance into a UN-backed treaty specifically targeting launch-on-warning automation.
- Standardizing Red-Line Governance: Establishing mandatory Human-in-the-Loop architecture across all strategic military command networks.
- Mobilizing Public Grassroots Pressure: As noted by Nobel laureate David Gross, raising public awareness is necessary to compel political leaders to prioritize AI-nuclear safety.
- MandatingSovereign Cyber Audits: Forcing nuclear states to isolate strategic software networks from commercial large language models and unverified cloud architectures.

Conclusion:

The Rome Declaration delivers a vital warning against outsourcing moral decisions to autonomous code. While technology can process data at speeds far beyond human capacity, collective moral responsibility—necessary to ensure human survival—must never be delegated to an algorithm. Achieving true global security requires world leaders to reject technological fatalism and ensure that human control remains an absolute, non-negotiable baseline.

India's First eVTOL Aircraft (e200X)

Context:



Chennai-headquartered deep-tech startup The ePlane Company (incubated at IIT Madras) unveiled e200X (PT-01), India's first full-scale prototype of an electric vertical take-off and landing (eVTOL) aircraft.

India's First eVTOL Aircraft (e200X)

AboutIndia's First eVTOL Aircraft (e200X):

What It Is?

- An electric vertical take-off and landing (eVTOL) aircraft—often termed an electric air taxi—is a zero-emission, battery-powered aircraft that lifts off and lands vertically like a helicopter before transitioning to forward winged flight like a conventional airplane.
- Developed By: The e200X platform was engineered, designed, and assembled in-house by The ePlane Company.

How It Works?

- Vertical Lift vs. Forward Flight: Unlike complex tilt-rotor designs that physically rotate engines, the e200X uses separate, dedicated propulsion sets: six vertical lift rotors for hover/take-off and four forward propellers for cruise flight.
- Distributed Electric Propulsion (DEP): If any single motor or propeller fails during flight, the remaining motors automatically redistribute thrust to descend or land safely, eliminating single-point mechanical failures.
- Patented Synergistic Lift Architecture: Built with a patented wing design that provides aerodynamic lift at low airspeeds. This allows the aircraft to maintain stability without requiring an intrusive, wide wingspan.
- Advanced Edge Compute & Sensor Fusion: Driven by an 800V high-voltage EV powertrain, the aircraft runs on the NVIDIA IGX Thor platform, fusing real-time data from cameras, LiDAR, and radar to give the pilot a 360° view through congested urban environments.

Key Features of the e200X:

- Ultra-Compact Global Footprint: Measures just 8 meters × 11 meters. This footprint allows it to operate directly from existing helipads or standard hospital rooftops without requiring purpose-built vertiports.
- Carbon-Fiber Composite Structure: Constructed out of lightweight carbon-fiber composites with a maximum gross vehicle weight of 2 tonnes.
- Payload & Operating Range: Engineered to carry 1 pilot plus a 200 kg payload (fitting up to 2 passengers or a trauma patient with a paramedic) with a range of 110 km on a single charge.
- Digital Twin Validation: Developed and tested virtually using NVIDIA Omniverse before physical assembly, backed by over 10,000 km of flight testing on subscale demonstrators.

Key Applications:

- Enables rapid transport of critical patients, medical teams, and equipment while bypassing urban traffic.
- Supports fast airport transfers and urban logistics along fixed routes, reducing travel time significantly.

Maglev Trains

Context:



Scientific and industrial interest in magnetic levitation (maglev) technology has re-emerged in global transportation news as countries seek friction-free, ultra-high-speed rail solutions.

Maglev Trains

AboutMaglev Trains:

What It Is?

- Maglev (a portmanteau of magnetic levitation) is an advanced high-speed rail transportation system. Instead of relying on traditional mechanical wheels, axles, and steel tracks, maglev trains use powerful, computer-controlled magnetic fields to suspend the train body above a specialized guideway and propel it forward.

How It Works?

- Levitation (Lifting the Train):Because the electromagnetic force is approximately 1039 times stronger than Earth's gravity, magnetic fields easily lift heavy train cars (weighing 150 to 500 tonnes) off the ground.
- Electromagnetic Suspension (EMS): Used in systems like the Shanghai Maglev. Wrap-around C-shaped train arms exert attractive magnetic forces upward toward the steel underside of the guideway, levitating the train about 10 mm above the track.
- Electrodynamic Suspension (EDS): Used in Japan's SCMAGLEV. Superconducting magnets cooled to cryogenic temperatures induce electric currents inside track coils as the train moves, creating repulsive magnetic forces that hover the train 100 mm above the track.
- Propulsion (Moving Forward):The track walls are lined with linear electric motor coils carrying an alternating current (AC). This AC continually flips the magnetic poles along the track. The train's magnets are attracted to opposite poles ahead and repelled by identical poles behind, pulling and pushing the vehicle forward. Increasing the frequency of the AC increases the train's speed.
- Lateral Guidance & Braking: Side-mounted magnets counteract lateral drift, keeping the train centered along the guideway. To stop, the AC direction is reversed (regenerative braking). Emergency systems use friction pads or deploy auxiliary mechanical wheels.

Key Features of Maglev Systems:

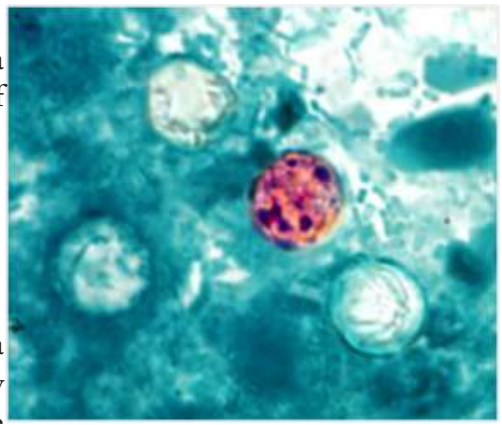
- Zero Rolling Friction: Eliminating physical wheel-on-rail contact removes mechanical friction, allowing for near-silent operation and lower structural wear-and-tear.
- Extreme Operational Speeds: Easily exceeds 400 km/hr in commercial service (e.g., Shanghai's 431 km/hr service) and holds experimental rail world records up to 603 km/hr (Japan's SCMAGLEV).
- Weather-Resistant Reliability: Because the vehicle hovers, operations remain unaffected by surface hazards such as heavy rain, snow, or ice.
- Virtually Impossible Derailment: The train structure physically wraps around the guideway, making derailments nearly impossible even during severe seismic events.
- High Infrastructure Costs: Requires dedicated, precision-engineered guideways with embedded electromagnets. They cannot run on existing standard-gauge railway tracks.

Applications Beyond High-Speed Trains:

- Precision Factory Automation: Used in cleanroom environments, semiconductor chip manufacturing, and medical packaging to move components rapidly without dust-generating mechanical friction.
- Industrial Turbines & Bearings: High-speed compressors and energy flywheel systems use active magnetic bearings (AMBs) to suspend rotating shafts, removing mechanical friction and eliminating the need for oil lubricants.
- EMALS Aircraft Launch Systems: Modern military aircraft carriers (such as the Electromagnetic Aircraft Launch System or EMALS) use linear induction motors derived from maglev propulsion to launch heavy fighter jets off short runways.
- Scientific Research: High-field magnets generate diamagnetic levitation to suspend liquids, biological cell cultures, and microgravity experiments on Earth without physical contact.

Cyclosporiasis

Context:



The U.S. Centers for Disease Control and Prevention (CDC) issued a major health advisory, following a massive, widespread outbreak of cyclosporiasis across 34 states.

Cyclosporiasis

AboutCyclosporiasis:

What It Is?

- Cyclosporiasis is a type of food poisoning caused by Cyclospora cayetanensis, a microscopic, single-celled parasite. While generally not life-threatening, the infection targets the human digestive system, leading to prolonged intestinal distress and potential complications if left untreated.

How It Occurs?

- Transmission: Spreads through the fecal-oral route by consuming food or water contaminated with infected fecal matter.
- No Direct Person-to-Person Spread: The parasite must mature in the environment before becoming infectious, preventing immediate transmission between people.
- Major Sources: Commonly linked to contaminated fresh produce such as leafy greens, basil, cilantro, raspberries and snow peas.

Key Features:

- Seasonal Pattern: In the U.S., cases typically peak during spring and summer, particularly from May to August.
- Difficult Diagnosis: Requires specific stool PCR or microscopy tests, often involving multiple samples because the parasite is shed intermittently.
- Underreporting Risk: Testing difficulties and unreported mild cases mean actual infections may significantly exceed official figures.
- Disinfectant Resistance: Standard sanitizers and vegetable washes may not completely remove or destroy the parasite on fresh produce.

Symptoms and Complications:

- Primary Symptom: Frequent and prolonged watery diarrhoea, typically beginning about one week after exposure.
- Other Symptoms: Loss of appetite, stomach cramps, bloating, fatigue, nausea, mild fever and weight loss.
- Vulnerable Groups: Children, elderly people and immunocompromised individuals face greater risks of prolonged illness and relapse.
- Potential Complications: Severe dehydration, nutrient malabsorption, gallbladder inflammation and reactive arthritis may occur.

Treatment:

- First-Line Treatment: A 7–10-day course of trimethoprim-sulfamethoxazole (TMP-SMX) is the standard recommended therapy.
- Immunocompromised Patients: Longer treatment may be required to prevent recurrent infection.
- Rehydration: Adequate water and electrolyte replacement is essential to prevent dehydration caused by prolonged diarrhoea.

The AI Squatting

Context:

Cybersecurity researchers have sounded the alarm on AI Squatting, a dangerous new class of cyber threats where attackers weaponize predictable AI hallucinations rather than software bugs.



The AI Squatting

AboutThe AI Squatting:

What It Is?

- AI Squatting is a cyberattack technique that exploits AI-generated hallucinations, where large language models (LLMs) create convincing but non-existent websites or software packages. Attackers register these fake assets to steal data, credentials, or distribute malware.

Types of AI Squatting:

1. Phantom Squatting (Internet Domains)

- Targets hallucinatedwebsite domains generated by AI chatbots.
- Attackers register fake domains before legitimate owners and use them for phishing, credential theft, and malware distribution.

2. HalluSquatting (Software Supply Chain)

- Targets AI-generated fake software libraries or repositories suggested by coding assistants.
- Attackers upload malicious packages with these names, tricking developers into installing compromised software.

Key Features:

- Exploits AI Hallucinations: Does not require software vulnerabilities or prompt injection attacks.
- Scalable Threat: Recurring AI-generated errors allow attackers to target many users simultaneously.
- Difficult to Eliminate: Hallucinations arise from the probabilistic nature of LLMs and cannot be fully removed.
- GrowingAttack Surface: Thousands of malicious and unregistered AI-hallucinated domains have already been identified.

Implications:

- Software Supply Chain Risks: Fake AI-recommended packages can introduce malware and backdoors into enterprise systems.
- Threat to Agentic AI: Autonomous AI agents may unknowingly execute malicious links or install compromised software without human oversight.
- ChangingCybersecurity Practices: Organizations must verify AI-generated links, code, and package names as part of routine security checks.

India's Research Leap: Why Innovation and R&D Will Define India's Strategic Future

Context:



CEO of ANRF and Chief Economic Adviser argued that recent global supply disruptions have created a strategic opportunity for India to strengthen its research ecosystem.

India's Research Leap

AboutIndia's Research Leap: Why Innovation and R&D Will Define India's Strategic Future:

What it is?

- India's transition towards indigenous innovation is essential for achieving technological self-reliance and reducing dependence on foreign intellectual property. As recent global supply disruptions have shown, critical technologies and supply chains are increasingly becoming instruments of geopolitical power.

India's Current Research Scenario:

- Low R&D Expenditure: India spends only 0.64% of GDP on research and development, significantly below the global average.
- Limited Private Investment: Private enterprises finance only about 40% of India's R&D expenditure, compared to over 75% in leading innovation economies.
- ANRF as Institutional Anchor: The Anusandhan National Research Foundation (ANRF), established as a statutory body, aims to strengthen collaboration among academia, industry, startups, and government.
- Large Public Funding Push: ANRF provides 1 lakh crore through the Research, Development and Innovation (RDI) Fund for private-sector innovation and 50,000 crore through ANRF Core for fundamental research.

Why Private Industry Matters?

- Catalytic Public Funding: ANRF acts as a de-risking catalyst, providing patient capital that encourages firms to undertake high-risk, long-term research rather than replacing private investment.
- Multiplier Effect: Every 1 of ANRF support can mobilise 5–10 of private investment, enabling the commercialisation and large-scale deployment of research outcomes.
- BridgingLab to Market: Private firms possess the expertise, manufacturing capacity, and market access needed to convert research prototypes into commercially viable products.
- Multiple Collaboration Pathways: Companies can participate through co-investment, joint ventures with deep-tech start-ups, national missions, or CSR contributions to the ANRF Innovation Fund.

Lessons from India's Pharmaceutical Success:

- History proves that Indian industry can rise to major technological challenges when forced by shifts in global rules. In the mid-1990s, when India joined the World Trade Organization (WTO) and agreed to honor strict product patents in pharmaceuticals, many experts predicted the local drug sector—which specialized in reverse-engineering foreign molecules—would be completely wiped out by multinationals.

Instead of retreating, domestic drug firms chose to build capabilities from the ground up:

- They rapidly mastered process chemistry and conformed to the world's most demanding international regulatory requirements.
- They transformed India into the trusted "pharmacy of the world," proving that facing strict global rules can spark an industrial leap.

Opportunities Before India:

- Reversing the High-Value Brain Drain: Scaling up advanced R&D projects provides long-term employment and world-class research settings for the top doctoral talent India trains at public cost, keeping them from leaving for overseas labs.
- Capitalizing on Multi-Polar Supply Shifts: The current global environment actively rewards economies offering a reliable, safe alternative to a single dominant global supplier, opening up major export lanes for Indian technologies.

- Leveraging Digital Public Infrastructure: India can build next-generation software tools and automated services directly on top of its world-class, pre-existing open digital foundations.
- MaximizingGlobal Capability Centres (GCCs): The high concentration of multinational GCCs already operating inside India provides an immediate workspace to launch co-funded, pre-competitive technological challenges.

Key Challenges in the Innovation Landscape:

- The Legacy Focus on Incremental Gains: A heavily protected domestic market has historically encouraged local companies to focus on low-risk, incremental process updates rather than investing in disruptive, long-horizon technologies.
- Deep Capital Concentration in Hostile Economies: Rising industrial rivals command major resource advantages; for example, China invests 2.43% of its massive output into R&D, with three-quarters of that sum financed directly by its own corporations to lock in control over frontier technologies.
- Short-TermCorporate Vulnerability: The constant pressure on private executives to deliver immediate, short-term quarterly income results frequently suppresses corporate budgets for speculative, multi-year laboratory research.
- Archaic Procurement Paradigms: Government tenders have historically prioritized lowest-cost bids (L1 frameworks) rather than evaluating quality, value, and long-term domestic innovation elements.

Way Forward:

- Deploying the 1 Lakh CroreANRF Fund: Fast-track the distribution of long-term anchor capital under the Research, Development, and Innovation Fund to finance high-risk, pre-commercial private research sectors.
- Building Insulated Corporate Research Units: Private firms must set up dedicated internal research units and corporate venture branches protected from the pressure of short-term quarterly returns.
- Updating Government Procurement Guidelines: Reform public tender frameworks to prioritize indigenously developed patents, ensuring state contracts provide a reliable market for local innovations.
- Forging Bipartisan Multi-Year Research Missions: Align public university laboratories, deep-tech startups, and private corporations behind target technological goals, such as advanced energy storage and local chip architectures.

Conclusion:

The state has established the necessary foundation by launching the ANRF and committing substantial long-term capital; the laboratories are ready, and the demographic dividend is available. Ultimately, it is now up to private industry to back this public catalyst with its own capital, shifting India from a consumer of global intellectual property into a vital engine of international innovation.

The Proton Exchange Membrane (PEM) Fuel Cell



Context:

Prime Minister of India flagged off India's first hydrogen-powered train, the NaMo Green Rail, on its official maiden run along the 89-km Jind–Sonipat section in Haryana.

The Proton Exchange Membrane (PEM) Fuel Cell

AboutThe Proton Exchange Membrane (PEM) Fuel Cell:

What It Is?

- A Proton Exchange Membrane (PEM) fuel cell is a compact electrochemical power generator that converts the chemical energy of hydrogen fuel directly into clean electricity. In the context of the NaMo Green Rail, it functions as a decentralized, zero-emission mini power plant carried onboard to power the train's traction motors.
- Developed and Integrated By: The technical specifications were drafted by the Research Designs and Standards Organisation (RDSO), the system was engineered and integrated by M/s Medha Servo Drives.

How It Works?

- Hydrogen Splitting at the Anode: Hydrogen gas stored in the train's cylinders is fed into the anode side of the fuel cell, where a catalyst splits the hydrogen molecules into protons (H+) and electrons (e–).
- The Membrane Barrier: The specialized polymer membrane allows only the positively charged protons to pass through to the cathode, blocking the electrons.
- Electricity Generation: Forced to find an alternative route, the blocked electrons travel through an external circuit, generating the continuous electrical current needed to drive the train's wheels.
- CleanCathode Recombination: At the cathode, the protons and electrons recombine with oxygen drawn from the surrounding air. The only resulting by-products are completely harmless water vapor and heat.

Key Technical Features of the Onboard Power System:

- Hybrid Energy Storage Architecture: The train features two specialized Hydrogen Driving Power Cars (DPCs) at each end, which combine the PEM fuel cells with high-capacity Lithium Iron Phosphate (LFP) batteries to ensure stable power delivery under fluctuating track loads.
- High-Pressure Refueling Matrix: Fuel is drawn from onboard storage cylinders that are refueled at a regulated pressure of 350 bar from an on-site 500-bar green hydrogen electrolysis compression facility located at Jind.
- Fail-Safe Leak Protection: Because hydrogen is highly flammable, invisible, and odorless, the system features continuous leak, flame, and heat sensors linked to an automatic supply shut-off system that responds instantly without requiring manual human input.
- ContinuousCanopy Ventilation: The power cars are built with active, continuous ventilation loops designed to immediately dilute and vent any trace hydrogen gas into the open atmosphere, preventing dangerous gas buildup.

Significance:

- Replaces diesel trains on non-electrified routes with hydrogen-powered trains, reducing emissions and supporting India's Net Zero goals.
- Creates demand for green hydrogen, encouraging investment in hydrogen production, refuelling infrastructure, and clean-energy technologies.

Forward Deployed Engineering (FDE)

Context:

Tech giants are expanding Forward Deployed Engineering (FDE) roles to turn AI pilots into measurable business value. The role is rapidly emerging as a high-demand, high-paying AI career globally and in India.



Forward Deployed Engineering (FDE)

AboutForward Deployed Engineering (FDE):

What It Is?

- Forward Deployed Engineering (FDE) is a multidisciplinary role combining software engineering, AI implementation, solutions architecture and business consulting. FDEs work directly with clients to deploy AI solutions in real-world business environments.
- Aim: The primary aim is to close the AI value gap by converting experimental AI models into secure, practical workflows that improve business efficiency, productivity and revenue.

How It Works?

- Direct Client Integration: FDEs work closely with clients to understand real-time business problems, integrate sensitive enterprise data securely and rapidly build customised AI solutions.
- Cross-Model Orchestration: They integrate AI models from multiple providers and open-source platforms into unified workflows, reducing dependence on any single technology vendor.

- Standardised Interoperability: FDEs use protocols such as Model Context Protocol (MCP) and Agent2Agent (A2A) to enable different AI agents and cloud platforms to communicate effectively.

Key Features of the FDE Domain:

- High-Premium Compensation: Strong demand and limited skilled talent make FDE one of the highest-paying emerging AI careers, with lucrative opportunities in both global and Indian markets.
- Two-Pronged Talent Pool:Tech graduates primarily handle coding and data pipelines, while technically fluent MBAs translate business challenges into technology roadmaps and manage client relationships.
- Rapid Global and Indian Demand: FDE job opportunities are expanding rapidly across AI companies, IT consulting firms and Global Capability Centres as enterprises scale AI adoption.
- University Educational Pivot: Leading Indian institutions are introducing specialised programmes in forward-deployed AI, data analytics and agentic AI to meet growing industry demand.

Key Applications:

- DesigningResilient Enterprise Workflows: FDEs integrate AI with ERP, CRM and supply-chain systems to automate processes, predict disruptions and improve real-time decision-making.
- Mitigating Technology and Compliance Risks: Multi-model orchestration reduces vendor dependence, protects sensitive data and helps enterprises manage geopolitical, regulatory and technology risks.
- Emergency and Humanitarian Logistics: FDEs develop localised AI systems for satellite-image analysis, disaster response and drone logistics, including in areas with disrupted communication networks.

The IMAT-05 Test

Context:

ISRO successfully executed the fifth Integrated Main Parachute Airdrop Test (IMAT-05) at the Aerial Delivery Research and Development Establishment (ADRDE) drop zone in Sheopur.



The IMAT-05 Test

AboutThe IMAT-05 Test:

What It Is?

- IMAT-05 is a high-altitude structural qualification test designed to evaluate the physical integrity, deployment mechanics, and aerodynamic efficiency of the Gaganyaan crew module's final deceleration system. It simulates the harsh dynamic forces a spacecraft faces as it plunges back through Earth's atmosphere before ocean splashdown.

Developed and Executed By:

- The test was a highly coordinated multi-agency operation planned and executed jointly by:
- ISRO (The Indian Space Research Organisation)
- DRDO (Specifically its specialized laboratory, the Aerial Delivery Research and Development Establishment – ADRDE)
- Objective: The objective of IMAT-05 was to validate the maximum design limits and structural safety margins of the primary main parachute under the most punishing load conditions expected during the upcoming uncrewed G1 flight.

Key Operational and Technical Features:

- Airdrop Logistics: A dummy payload mimicking the mass of the actual crew module was dropped from an altitude of 2.5 km using an Indian Air Force IL-76 heavy transport aircraft.
- The 10-Parachute Deceleration Matrix: The total system architecture relies on four distinct types of parachutes to manage the capsule's terminal velocity:
- Apex Cover Separation Parachutes (2 units): Jettison the protective top cover of the capsule to expose the parachute bay.
- Drogue Parachutes (2 units): Deploy into the high-speed airflow to stabilize the capsule and bring down its initial descent rate.

- Pilot Parachutes (3 units): Act as small extractors to physically pull out the main canopies.
- Main Parachutes (3 units): Ultra-large canopies that deploy sequentially to reduce the crew module's speed down to a safe terminal velocity for impact.
- Sequential Disreefing Integrity: The test successfully verified the disreefing sequence—a vital feature where a parachute opens in controlled stages rather than popping open all at once, protecting the fabric and lines from tearing under sudden, intense dynamic pressures.

Significance:

- IMAT-05 tested the parachute at maximum aerodynamic loads, providing crucial structural validation for Gaganyaan's upcoming uncrewed G1 demonstration flight.
- IMAT-05 validated parachute strength and backup systems under extreme re-entry conditions, ensuring reliable crew-capsule deceleration and safety.

Once-Weekly Basal Insulin Awiqli

Context:

Global healthcare giant Novo Nordisk announced the official launch of Awiqli in India, marking the country's entry as only the seventh market in the world to introduce this drug.

Once-Weekly Basal Insulin Awiqli

AboutOnce-Weekly Basal Insulin Awiqli:

What It Is?

- Awiqli (known generically as insulin icodec) is a long-acting background (basal) insulin analogue. It is the world's first and only once-weekly basal insulin approved for clinical use in adults diagnosed with either Type 1 or Type 2 Diabetes Mellitus, offering background glycemic control that lasts a full seven days.
- Developed By: The breakthrough drug was researched, engineered, and brought to market by the Denmark-based pharmaceutical multinational Novo Nordisk.
- Aim: It aims to eliminate the psychological dread of needles, reduce physical injection pain, and lower patient resistance to starting insulin therapy early.

Key Features:

- Significant Drop in Injection Burden: Replaces the rigid requirement of daily injections administered every 24 hours. This drops the baseline treatment burden from 365 injections per year down to just 52 injections, simplifying long-term care.
- Superior Clinical Efficacy (ONWARDS-1): In extensive global clinical trials, Awiqli demonstrated superior blood sugar management compared to standard once-daily insulin glargine U100.
- It achieved greater reductions in HbA1c levels and significantly improved Time in Range without increasing the risk of dangerous drops in blood sugar (hypoglycemia).
- Delivery Mechanism: Distributed through Novo Nordisk's proprietary, pre-filled FlexTouch pen device, which allows for highly accurate dosing and simple, user-friendly self-administration at home.
- Indian Market Pricing & Presentation: The drug is priced competitively to encourage widespread adoption among insulin users:
- Per Unit Base Cost: Priced at approximately 3.73 per unit.
- The 1 ml Presentation: A 700-unit pre-filled pen is priced at 2,611.
- The 3 ml Presentation: A 2,100-unit high-capacity pen is priced at 7,833.
- The Cost Advantage: For a standard weekly dose of 70 units, the operational cost comes to roughly 261, making it more affordable than many legacy daily basal options that range from 345 to 453 for the same volume.

Significance:

- Once-weekly insulin reduces the fear of daily injections, encouraging earlier treatment initiation and lowering the risk of long-term diabetes-related complications.
- Awiqli increases competition by challenging daily basal insulins, encouraging Indian pharmaceutical companies to accelerate innovation in long-acting insulin therapies.

The CE20 Cryogenic Engine

Context:



The ISRO successfully completed the flight acceptance hot test of its indigenous CE20 cryogenic engine for the upcoming LVM3-M7 mission at the ISRO Propulsion Complex in Mahendragiri.

The CE20 Cryogenic Engine

About The CE20 Cryogenic Engine:

What It Is?

- The CE20 is a high-thrust, indigenously developed cryogenic rocket engine that powers the upper stage (C25/C32 flight stage) of India's heaviest operational launch vehicle, the Launch Vehicle Mark-3 (LVM3).
- It burns super-cooled liquid propellants to generate the massive velocity needed to inject heavy payloads into Geosynchronous Transfer Orbits (GTO) and deep-space trajectories.
- Developed By: Developed by ISRO's Liquid Propulsion Systems Centre (LPSC) and qualified through testing at the ISRO Propulsion Complex (IPRC).

Background:

- CE20 replaced the smaller CE-7.5 with a more reliable indigenous design and has successfully powered eight consecutive LVM3 missions, including Chandrayaan-2 and Chandrayaan-3.
- Core Aim: It provides a reliable indigenous upper-stage engine for heavy satellites, LEO constellations, and human spaceflight missions such as Gaganyaan.

Key Technical Features:

- Gas-Generator Cycle: Uses a simpler gas-generator cycle, improving engine reliability, easier startup, and better control during upper-stage operations.
- Cryogenic Propellant Matrix: Burns liquid hydrogen (LH_2) and liquid oxygen (LOX), delivering high efficiency for heavy-lift space missions.
- Flexible Thrust Throttling: Operates between 19–22 tonnes of thrust, allowing stable performance across different mission requirements.
- Nozzle Protection System (NPS): Enables safe sea-level testing of the large cryogenic nozzle without costly high-altitude vacuum test facilities.
- Human-Rated Safety Architecture: Incorporates redundant systems, structural safety margins, and health monitoring to meet Gaganyaan crew safety standards.

Applications:

- Upper-Stage Engine for LVM3: CE20 provides the final propulsion needed to place heavy communication satellites and deep-space missions into precise orbits.
- Core Engine for Gaganyaan: The human-rated CE20 will power LVM3's upper stage, safely placing Indian astronauts into low-Earth orbit.

India's First OptoSAR Earth Observation Satellite

Context:



Bengaluru-based space start-up GalaxEye announced that communication with Mission Drishti—the world's first OptoSAR satellite and India's largest privately built Earth observation satellite—has been lost.

Mission Drishti: India's First OptoSAR Earth Observation Satellite

AboutMission Drishti: India's First OptoSAR Earth Observation Satellite

What It Is?

- Mission Drishti is a next-generation, high-performance Earth observation satellite designed and engineered entirely within India's private sector. Weighing 190 kilograms, it represents a major technological milestone as the first operational spacecraft in global history to fuse optical and radar imaging sensors onto a single, compact satellite chassis.

Launched By:

- The Manufacturer: Developed by GalaxEye, a deep-tech space start-up incubated out of Bengaluru.
- Launch Vehicle & Site: Launched into orbit on May 3, 2026, aboard a SpaceX Falcon 9 rocket from the Vandenberg Space Force Base in California, USA.

Aim of the Mission:

- To build a sovereign, non-blind satellite network capable of monitoring high-altitude borders and maritime zones without interruptions from weather or nightfall.
- To plug critical intelligence gaps for the Indian Armed Forces along borders with China and Pakistan, ending reliance on delayed foreign commercial imagery during strategic standoffs.

Key Technical Features of the OptoSAR Payload:

- The OptoSAR Sensor Fusion:OptoSAR combines Electro-Optical (EO) cameras and Synthetic Aperture Radar (SAR) on a single satellite, enabling simultaneous collection of optical and radar imagery.
- Overcoming Natural Obstacles:EO cameras capture clear visual images but fail in clouds or darkness, while SAR works in all weather and at night. OptoSAR merges both for reliable, all-weather imaging.
- Co-registered Data Streams:OptoSAR records optical and radar data from the same location and time, eliminating alignment errors and delays common with separate satellites.
- Global Imagery Distribution Model:Through NewSpace India Limited (NSIL), Mission Drishti will commercially distribute its hybrid satellite imagery to domestic and international users.

Significance:

- Mission Drishti showcases India's private space capabilities by demonstrating that domestic startups can independently build advanced, globally competitive satellite technologies.
- Its all-weather surveillance capability strengthens border monitoring by detecting activities even through clouds, heavy rain, fog, or darkness.
- OptoSAR demonstrates the commercial value of combining optical and radar sensors, enabling faster, cost-effective services for agriculture, shipping, and defence.

India's Semiconductor Push

Context:

Prime Minister of India inaugurated the commercial production phase of the CG Semi Outsourced Semiconductor Assembly and Test (OSAT) facility in Sanand, Gujarat.



India's Semiconductor Push

AboutIndia's Semiconductor Push:

What it is?

- India's semiconductor push is a comprehensive, state-backed industrial strategy aimed at building a localized, full-stack electronics value chain spanning chip design, fabrication, assembly, testing, and packaging. Governed by the India Semiconductor Mission (ISM), this initiative seeks to transition the country from a mere consumer of foreign microelectronics to a self-reliant global manufacturing hub.

Semiconductor Infrastructure Created So Far:

- The Sanand OSAT Packaging Cluster: Gujarat's Sanand has emerged as India's premier chip-packaging hub, housing three massive, distinct operational facilities: Micron Technology's ATMP facility, the Kaynes Semicon OSAT unit, and the newly commercialized CG Semi plant.
- The MegaWafer Fabrication Plant: Tata Electronics Private Limited (TEPL), in a multi-billion-dollar partnership with Taiwan's PSMC, is setting up India's first commercial silicon fabrication foundry in Dholera, Gujarat, aiming for first silicon output by late 2026.
- Advanced 3D Packaging Infrastructure: India executed the groundbreaking of its first specialized Heterogeneous Integration and advanced 3D semiconductor packaging unit in Bhubaneswar, Odisha, to fuel AI and defense applications.
- Design-Linked Incentive (DLI) Ecosystem: The Ministry of Electronics and Information Technology (MeitY) actively supports 24 fabless semiconductor design startups backed by a database of over 67,000 students trained on advanced EDA design tools.

Importance of Semiconductors to the Nation:

- The Core ofNational Security: Microchips are the absolute backbone of critical defense infrastructure, powering advanced guidance systems, secure aerospace satellites, and localized radar networks.
- Powering the Artificial Intelligence Boom: Achieving leadership in the AI, robotics, and next-generation supercomputing era is entirely impossible without local, uninterrupted access to advanced computing silicon.
- Fueling the Automotive and Telecom Industries: Local chip assembly secures vital supply lines for India's massive electric vehicle (EV) manufacturing transition and nationwide 5G/6G commercial rollouts.
- Unlocking High-Skill Industrial Jobs: The transition to commercial chip packaging transforms local human capital, pulling workers from the agrarian hinterlands into high-tech, precision cleanroom engineering roles.
- Mitigating Fragile Import Vulnerabilities: Domestic fabrication stabilizes the wider macroeconomy, preventing sudden foreign factory lockdowns or chokepoint blockades from paralyzing local consumer electronics production.

Key Challenges Associated with the Semiconductor Push:

- MassiveLong-Term Capital Demands: Building and operating sub-surface wafer fabs requires continuous capital outlays, far exceeding the initial 76,000 crore phase-one budgetary baseline.
- Extreme Vulnerability to Monopolistic Competition: Emerging Indian packaging plants face fierce market competition from firmly established global giants like Taiwan, China, and South Korea, which command deep ecosystem advantages.
- High Reliance on Ultra-Pure Utilities: Operating precision cleanrooms requires an absolutely continuous, uninterrupted supply of millions of gallons of deionized water and highly stable electrical power grids.
- A Shortage ofDomestic Raw Materials and Gases: India lacks an internal supply chain for specialized precursor chemical substrates, photomasks, and ultra-pure electronic-grade gases, leaving foundries reliant on imports.
- The Steep Learning Curve for Advanced Fabrication: While packaging and testing (OSAT) are being successfully commercialized, cracking the complex physics of advanced sub-10nm logic node wafer fabrication remains an steep hurdle.

Way Forward:

- Aggressively Funding the India Semiconductor Mission 2.0: Swiftly clear the proposed 1.25 lakh crore outlay under ISM 2.0 to broaden public support toward manufacturing equipment, specialized materials, and indigenous intellectual property.
- Securing Dedicated Green Energy and Water Corridors: State governments must establish dedicated sub-stations and circular wastewater recycling networks directly adjacent to semiconductor clusters like Dholera and Sanand.
- Transitioning to Advanced Multi-Vendor IP Design Fabs: Expand the scope of the Design-Linked Incentive (DLI) scheme to support at least 50 local fabless chip design firms, creating a reliable pipeline of indigenous silicon layouts.
- Expanding Specialized International Training Pacts: Formalize extensive workforce training collaborations

with advanced nations like Malaysia, Singapore, and Japan to systematically upskill local engineers in high-yield manufacturing.

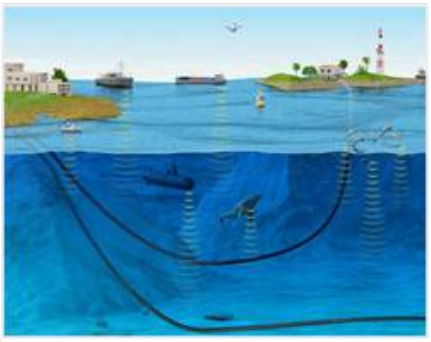
- EnforcingMade in India Microchip Procurement Quotas: Implement gradual domestic sourcing mandates across public infrastructure bids, electric vehicle incentives, and government defense tenders to create a guaranteed local market.

Conclusion:

By turning 7,600 crore in joint venture investments into export-ready hardware, the India Semiconductor Mission has proven it can translate long-term policies into factory-ready output. Moving forward, securing the 1.25 lakh crore ISM 2.0 funding and building a reliable domestic raw-materials value chain will remain vital to survive global competition and establish technological sovereignty.

The Underwater Fiber Optic Sensing System (UFOSS)

Context:



The DRDO has launched a major naval project to deploy an indigenous Underwater Fiber Optic Sensing System (UFOSS) on the Indian Ocean seabed to detect submarines and counter rising Chinese and Pakistani underwater activity.

The Underwater Fiber Optic Sensing System (UFOSS)

About The Underwater Fiber Optic Sensing System (UFOSS):

What It Is?

The Underwater Fiber Optic Sensing System (UFOSS) is a fixed, non-collapsible network of advanced undersea acoustic and hydrographic sensors anchored to the ocean floor. It serves as India's version of a strategic underwater surveillance grid, designed to provide continuous, long-term tracking of the undersea battlespace across contested maritime choke points.

Objectives:

- To eliminate gaps left by periodic ship and aircraft patrols by providing uninterrupted monitoring of the Indian Ocean Region (IOR).
- To detect quiet, modern conventional submarines—such as Pakistan's newly acquired Chinese-built Hangor-class boats equipped with Air-Independent Propulsion (AIP)—and Chinese nuclear attack submarines (SSNs).

How It Works?

1. Acoustic Capture: When an uninvited submarine or vessel passes over the network, its propeller noise, engine vibrations, and machinery hum are picked up by hydrophones mounted on the seabed nodes.
2. Optical Transmission: These physical sound waves are converted into optical signals and carried through armored subsea fiber-optic cables, passing through junction boxes and branching units.
3. Shore Station Analysis: The data stream passes through a secure beach manhole and enters a dedicated naval shore monitoring station. High-speed computers analyze the acoustic signatures against a database to identify the exact class of the vessel.
4. Active Deployment: Once a target is confirmed, the shore station sends precise coordinates to the Navy's active fleet, deploying P-8I maritime patrol aircraft, MH-60R multi-role helicopters, or nearby warships to intercept the contact.

Key Technical Features:

- Advanced Wet-Plant Architecture: Built with highly durable, marine-grade underwater components—including sensor array nodes, subsea junction boxes, and branching units—engineered to withstand high pressure and salty corrosion.
- 20-Year Operational Lifespan: The entire system is engineered for a continuous 20-year service life, requiring highly reliable components that can function underwater for decades without routine maintenance.
- DeepSea Burial Protection: To shield the fiber cables from accidental damage caused by commercial ship

anchors, commercial fishing trawlers, or deliberate sabotage, the infrastructure will be buried deep in the seabed using specialized cable burial plows and Remotely Operated Vehicles (ROVs).

- Consortium-Led Integration: The project allows a lead bidder to partner with up to five specialized engineering firms, combining expertise across subsea cable manufacturing, marine geography surveys, and automated shore-monitoring software.
- 48-Month Execution Target: The procurement and setup timeline is planned across a 48-month window from the final contract award, managed directly by a specialized Lead System Integrator.

Sub-Orbital Launch Vehicle for Experiments (SOLVE)

Context:



The ISRO successfully conducted the first static ground test of its new solid motor-based Sub-Orbital Launch Vehicle for Experiments (SOLVE) at the Satish Dhawan Space Centre in Sriharikota.

Sub-Orbital Launch Vehicle for Experiments (SOLVE)

AboutSub-Orbital Launch Vehicle for Experiments (SOLVE):

What It Is?

- SOLVE is a specialized, solid propellant-based sub-orbital launch vehicle designed by ISRO to serve as an agile testbed for atmospheric and high-altitude experiments. It acts as a dedicated cost-effective launch platform to simulate specific atmospheric re-entry conditions without deploying a massive multi-stage orbital rocket.
- Lead Space Agency: Indian Space Research Organisation (ISRO).

Objectives:

- The primary aim is to carry out Integrated Parachute Tests (IPT) to validate the complex deceleration systems developed for the Gaganyaan mission's crew module.
- To precisely transport experimental payloads to sub-orbital heights, enabling engineers to study how systems deploy under realistic atmospheric pressures and velocities.

How It Works?

- ControlledSolid Propulsion: The rocket is launched using a modified, slow-burning solid propellant that provides a steady, controlled climb instead of a rapid hyper-acceleration blast.
- High-Altitude Transit: The vehicle carries the experimental cargo—specifically the Gaganyaan crew module prototype—up to a target altitude between 10 km and 17 km.
- Payload Separation: At the designated apex, the vehicle detaches the crew module, exposing it to the high-velocity slipstream to mimic actual atmospheric return forces.
- Parachute Cascade Deployment: Once separated, the module initiates a automated sequence that deploys a series of 10 distinct parachutes in stages, slowing the vehicle down safely before it splashes down in the sea.

Key Engineering Features:

- PSLV Strap-on Motor Derivative: SOLVE uses a modified PSLV Strap-on Motor (PSOM), reducing development costs while relying on ISRO's proven launch technology.
- Slow-Burn Propellant Chemistry: A specially modified solid propellant burns more slowly, providing stable, low-acceleration thrust for safe atmospheric testing.
- Straight Nozzle with SITVC: A straight nozzle with Secondary Injection Thrust Vector Control (SITVC) enables precise flight control by directing the exhaust flow.
- Dynamic Simulation Architecture: SOLVE can replicate different aerodynamic conditions, allowing engineers to closely simulate the Gaganyaan mission profile.

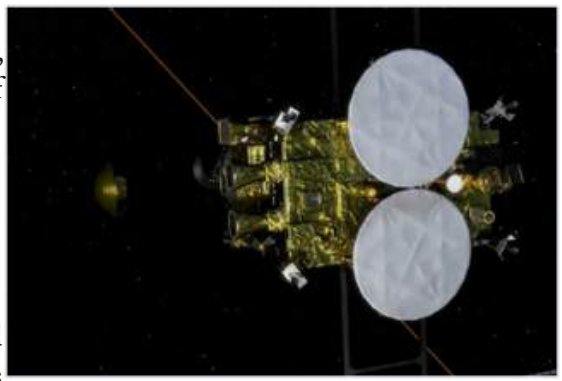
Uses and Applications:

- Gaganyaan Recovery System Testing: SOLVE validates the 10-parachute recovery sequence, ensuring the crew module decelerates safely before ocean splashdown.

- Cost-Effective Re-entry Testing: It enables repeated, low-cost sub-orbital tests, helping ISRO quickly validate designs and reduce dependence on expensive orbital launches.
- SupportingIndigenous Space Research: SOLVE also supports hypersonic technology tests, atmospheric studies, and microgravity experiments, strengthening India's space research capabilities.

Asteroid Torifune

Context:



Japan's space agency announced that its deep-space probe, Hayabusa2, successfully performed an incredibly close flyby within 800 meters of the near-Earth asteroid Torifune.

Asteroid Torifune

AboutAsteroid Torifune:

What It Is?

- Torifune is a sub-kilometer, primitive near-Earth asteroid (NEA) that orbits the Sun in close proximity to Earth's orbital path. It serves as a high-value celestial target for both planetary science exploration and impact mitigation testing.
- Orbital Profile: It moves within a deep space trajectory that classifies it as a potentially hazardous near-Earth object (NEO).

Key Features of Torifune:

- Estimated Dimensions: The asteroid has an estimated average diameter of approximately 450 meters.
- Elongated Geometry: Radar data and initial imaging suggest that its structure is noticeably elongated or asymmetrical rather than perfectly spherical.
- Rapid Rotational Period: Torifune spins rapidly on its axis, completing a full rotation approximately every five hours, which presents a shifting visual profile to passing space instruments.

About the Hayabusa2 Explorer:

What It Is?

- Hayabusa2 is a highly sophisticated, robotic deep-space exploration probe originally engineered for sample-return rendezvous operations. Following its successful 2020 delivery of pristine soil samples from the asteroid Ryugu, the spacecraft entered its Extended Mission phase (Hayabusa2#) to execute complex flyby missions across the solar system.
- Lead Entity: Japan Aerospace Exploration Agency (JAXA).

Aim of the Extended Mission:

- To test whether a spacecraft originally designed to match orbits slowly can navigate with the extreme accuracy needed to target or deflect a fast-moving asteroid.
- To master precision guidance systems at close range, proving that a probe could eventually serve as a kinetic impactor to smash into and divert a threat.

Key Technical Features:

- Compact, Fridge-Sized Footprint: Built as a highly efficient, compact cube platform optimized for long-duration deep space travel.
- Fixed Imaging Architecture: The probe lacks flexible telescope lenses or movable camera mounts; targeting requires adjusting the orientation (attitude) of the entire spacecraft to keep the asteroid in view.
- AdvancedIon Thruster Engine: Utilizes highly efficient electric ion propulsion systems to perform precise, small trajectory corrections over years of continuous deep-space navigation.
- Autonomous Target Locking: Employs advanced optical navigation software that automatically tracks the target's position up to the point of closest approach, ensuring high-resolution data capture without manual ground commands.

The Bundibugyo Virus Disease (BVD)

Context:



The World Health Organization (WHO) has added the first molecular diagnostic test for Bundibugyo virus (BDBV) to its Emergency Use Listing (EUL).

The Bundibugyo Virus Disease (BVD)

AboutThe Bundibugyo Virus Disease (BVD):

What It Is?

- Bundibugyo virus disease (BVD) is a severe, highly infectious, and frequently fatal zoonotic disease in humans. It is caused by the Bundibugyo virus, which is one of the distinct viral species belonging to the Orthoebolavirus genus (commonly referred to as the Ebola virus group).

Origin and Transmission:

- Natural Reservoir: Fruit bats are the suspected natural reservoirs hosting the virus in wild ecosystems.
- Spillover Event: Human infection initially triggers through close handling or contact with the blood, raw meat, or bodily secretions of infected wildlife, such as bats or non-human primates (monkeys and apes).
- Person-to-Person Spread: Once inside human communities, the virus spreads rapidly through direct contact with broken skin or mucous membranes coming into contact with the blood, organs, saliva, vomit, or other bodily fluids of infected individuals. It also spreads via contaminated surfaces, unsterilized medical gear, and unsafe traditional burial practices.

Key Epidemiological Characteristics:

- Incubation Period (2–21 Days): After infection, symptoms usually appear within 2–21 days. Patients are not infectious before symptoms develop, reducing transmission during incubation.
- High Case Fatality Ratio (CFR): Bundibugyo virus disease has a high mortality rate, with previous outbreaks recording 30–50% fatality, making early detection and treatment critical.
- Diagnostic Challenges: Early symptoms resemble malaria, typhoid, and other tropical fevers, making clinical diagnosis Confirmation requires PCR or antigen/antibody laboratory tests.
- No Approved Vaccine or Treatment: There is no licensed vaccine or specific antiviral drug for Bundibugyo virus disease. Control depends on early isolation, contact tracing, and supportive medical care.

Symptoms & Disease Progression:

- Early Stage: Patients develop high fever, severe fatigue, headache, muscle pain, joint pain, and sore throat, resembling many common viral infections.
- Gastrointestinal Stage: The disease progresses to vomiting, severe diarrhoea, and abdominal pain, causing dehydration and rapid physical weakness.
- Advanced Stage: Severe cases may develop liver and kidney failure, followed by internal and external bleeding (haemorrhage) due to widespread organ damage.

Implications:

- Because early symptoms resemble common fevers, infected patients may not be isolated immediately. Without proper PPE and infection-control measures, hospitals can become centres of transmission.
- Armed conflict, displacement camps, and weak healthcare systems in eastern DRC make surveillance, isolation, and contact tracing extremely difficult during outbreaks.
- Frequent movement across the DRC–Uganda border increases the risk of regional spread. Neighbouring countries must strengthen surveillance, laboratory testing, and border health preparedness.

Vikram-1, India's First Private Orbital Rocket

Context:



Hyderabad-based space-tech startup Skyroot Aerospace has announced that the launch window for its maiden test flight of Vikram-1, named Mission Aagaman.

Vikram-1, India's First Private Orbital Rocket

AboutVikram-1, India's First Private Orbital Rocket:

What It Is?

- Vikram-1 is a seven-storey-tall, multi-stage orbital launch vehicle designed to carry small satellites into Low Earth Orbit (LEO). Named after Dr. Vikram Sarabhai, the pioneer of the Indian space program, the rocket represents a major leap from suborbital test flights to full-scale, commercial orbital operations.
- Developed By: The rocket has been completely designed, developed, and manufactured in-house by Skyroot Aerospace, a Hyderabad-based private space startup founded by former ISRO scientists. Skyroot recently achieved unicorn status with a valuation of over $1.1 billion.

Aim of Mission Aagaman:

- The Mission: Christened Aagaman (a Sanskrit word meaning "arrival"), the mission symbolizes the arrival of India's private sector on the global orbital launch stage.
- Target Orbit: The flight aims to place payloads weighing up to 350 kg into a 450 km Low Earth Orbit with a 60-degree inclination.

Key Features:

- All-Carbon Composite Structure: The entire rocket is built using advanced lightweight carbon composite materials. This ensures the vehicle maintains high structural strength to survive extreme launch forces while shedding critical weight to maximize payload capacity.
- In-House Solid &Liquid Propulsion: Vikram-1 uses a mix of solid and liquid propulsion systems developed entirely by Skyroot. The first three stages utilize powerful solid rocket motors named after Dr. A.P.J. Abdul Kalam.
- 3D-Printed Rocket Engines: The vehicle integrates cutting-edge 3D-printed engine components, which allow for rapid manufacturing, lower production costs, and greater design flexibility compared to traditional machining.
- High Launch Cadence Design: The rocket is explicitly engineered for rapid assembly and high-frequency launches, catering to the fast-paced demands of global small satellite operators.
- Evolution from Vikram-S: Vikram-1 builds directly upon the foundational technology validated by the successful suborbital launch of the smaller Vikram-S rocket (Mission Prarambh) in November 2022.

Significance:

- A successful Vikram-1 launch will demonstrate that private Indian companies can independently build and launch orbital rockets, advancing India's space sector reforms.
- Vikram-1 strengthens India's position in the global small satellite launch market by offering reliable, cost-effective launch services for commercial satellite constellations.

EXCEL CIVILS ACADEMY EMPOWERING FUTURE LEADERS

Chapter-
6

ECONOMY

India's First Telecom Manufacturing Zone (TMZ)

Context:

The Department of Telecommunications (DoT) and the Government of Madhya Pradesh signed a MoU to establish India's first integrated Telecom Manufacturing Zone (TMZ) at Gwalior, Madhya Pradesh.



India's First Telecom Manufacturing Zone

AboutIndia's First Telecom Manufacturing Zone (TMZ):

What It Is?

- The Telecom Manufacturing Zone (TMZ) is an integrated, 350-acre plug-and-play industrial cluster designed to create a specialized ecosystem for telecommunications, electronics, research and development (R&D), testing, and intellectual property creation under one roof.
- Location: Gwalior, Madhya Pradesh (Phase-I covers 170 acres spread across the SADA region and Gwalior IT Park).
- Governing Body: A dedicated Special Purpose Vehicle (SPV) with a 51% equity stake held by the Government of Madhya Pradesh and 49% by the Department of Telecommunications (DoT).
- Aim: To reduce India's reliance on imported telecom hardware, accelerate indigenous R&D for 5G/6G technologies, boost domestic manufacturing, and establish India as a global exporter of telecom equipment.

Key Features:

1. Integrated End-to-End Ecosystem: Houses manufacturing units, high-end 4G/5G common testing facilities, product certification labs, and dedicated R&D design centers within a unified industrial zone.
2. Full-Spectrum Value Chain: Encompasses the entire telecom production spectrum—including mobile handsets, optical fiber cables, antennas, telecom routers, satellite communication gear, and semiconductor chips.
3. SubstantialCapital Commitments: Projected to attract 12,000 crore to 15,000 crore in long-term investments (with over 3,500 crore in initial commitments pledged by anchors like Dixon Technologies, HFCL, and VVDN).
4. Employment Generation: Expected to generate 14,000 direct skilled jobs (and over 3,500 during Phase-I), supported by state employment assistance programs.

Significance:

- Promotes domestic manufacturing of advanced telecom equipment, transforming India from a telecom consumer into an export-oriented production hub.
- Local manufacturing of critical telecom hardware reduces import dependence, strengthens supply chains, and safeguards critical network infrastructure.

Rupee Valuation



Context:

Reserve Bank of India (RBI) Governor Sanjay Malhotra made notable public observations clarifying that the Indian rupee is undervalued rather than overvalued in both nominal and Real Effective Exchange Rate (REER) terms.

Rupee Valuation

AboutRupee Valuation:

What It Is?

- Rupee valuation refers to assessing the true economic exchange rate of the Indian Rupee (INR) relative to foreign currencies (primarily the USD). It evaluates whether the market exchange rate accurately reflects India's internal purchasing power, trade competitiveness, and macroeconomic fundamentals.

How It Is Derived (Measuring Mechanisms)

1. Nominal Exchange Rate: The direct spot price of the rupee against a single currency (e.g., 1 USD = 85 INR). It is governed by daily supply-and-demand dynamics in foreign exchange markets.
2. Real Effective Exchange Rate (REER): The weighted average of the rupee relative to a basket of 40 major trading partner currencies, adjusted for relative inflation differences between India and those nations.

- Base Value = 100: A REER index value above 100 indicates currency overvaluation (exports become expensive). A REER index value below 100 indicates currency undervaluation (the rupee is trading cheaper than its inflation-adjusted fair value).

Key Factors Influencing Rupee Valuation:

- Domestic Macroeconomic Health: High GDP growth rate (>6), moderating domestic inflation, and robust forex reserves (covering 11+ months of imports) provide fundamental strength to the currency.
- Global Crude Oil & Commodity Prices: Because India imports over 85% of its crude oil, spikes in global energy prices increase dollar demand, creating temporary depreciation pressure.
- Foreign Portfolio Investments (FPI): Capital flight or hot money sell-offs in domestic equities by foreign institutional investors depress the nominal value of the rupee.
- US Federal Reserve Policy & Dollar Index (DXY): High interest rates in developed economies pull global capital toward high-yield, safe-haven US assets, strengthening the dollar against emerging market currencies.

Significance:

- Signals Economic Strength: Indicates that recent rupee weakness reflects temporary global shocks rather than underlying weaknesses in India's economy.
- Boosts Market Confidence: Reassures investors that the RBI will curb excessive volatility using its strong foreign exchange reserves, without targeting a fixed exchange rate.

India's Gen Z and Unemployment

Context:



An analysis of the PLFS 2023–24 by experts highlights a widening job transition crisis, with India's educated Gen Z struggling to secure formal employment despite the country's demographic dividend.

India's Gen Z and Unemployment

AboutIndia's Gen Z and Unemployment:

What it is?

- The Gen Z generation in India comprises working-age individuals aged 15 to 26 years (born between 1997 and 2012), representing a talent pool of roughly 29.94 crore people.
- Gen Z unemployment describes a structural failure where young jobseekers face high unemployment rates, delayed transitions from education to employment, and widespread absorption into informal or unpaid labor.

Key Data and Statistics on Gen Z Unemployment:

- Low Formal Wage Absorption: Only 14.8% of young Gen Z males and 4.7% of Gen Z females are

employed as regular wage earners, with the remainder working as casual laborers, unpaid family workers, or performing unpaid domestic duties.

- HighRate of Informality: Approximately 79.9% of Gen Z workers completely lack social security coverage, and only 14.1% possess a formal employment contract.
- Depressed Labour Force Participation (LFPR): Gen Z LFPR sits at 41.7% (versus 75% for Millennials), dropping sharply among young women to 28% in rural areas and 21.1% in urban areas.
- Extreme Domestic Burden on Women: About 27.1% of Gen Z females are engaged exclusively in unpaid domestic duties, compared to merely 0.32% of Gen Z males.

Reasons Behind Unemployment Among Indian Gen Z:

- Education-to-Work Mismatch: The higher education system prioritizes academic degrees over practical skills required by modern industries, leading to credential inflation without job readiness.
- Disrobing Jobs ThroughAutomation and AI: The rapid integration of artificial intelligence and automated processes is changing entry-level roles, cutting traditional entry-level white-collar and administrative positions.
- Structural Barriers and Social Norms for Women: Lack of affordable childcare, safety concerns during commutes, mobility constraints, and unequal domestic expectations keep millions of educated young women out of the paid workforce.
- Informalization of Formal Sectors: Industrial manufacturing and commercial entities increasingly rely on contract work, gig roles, and informal hiring, reducing the availability of stable, long-term jobs with social security.

Implications of Gen Z Job Crisis:

1. On Society:

- Rising Social Frustration and Unrest: A lack of stable employment options creates widespread economic anxiety, leading to labor strikes and public protests over job terms.
- Erosion of HouseholdFinancial Investment: Families stretch their financial resources to fund higher education, but low returns on educational investments cause widespread frustration and strain household budgets.
- Reinforcement of Gender Inequality: High barriers to formal employment push young women back into unpaid domestic labor, hindering social progress and women's economic independence.

2. On the Economy:

- Squandering the Demographic Dividend: Failing to transition young people into productive work risks turning a potential economic advantage into a long-term fiscal burden.
- Depressed Household Consumption Demand: Widespread informal labor and low wages limit the purchasing power of young adults, suppressing long-term domestic consumer demand.
- Low Productivity Traps: Absorbing educated youth into low-skilled casual labor or unpaid family roles suppresses national productivity growth and slows industrial innovation.

Way Forward:

- Expanding Labor-Intensive Manufacturing: Shift industrial policies to support labor-intensive sectors like textiles, food processing, and construction to absorb non-salaried and casual workers into formal roles.
- Mandating Direct Apprenticeship Pathways: Establish structured school-to-work pipelines by linking university degrees directly with industry-led apprenticeships and formal hiring incentives.
- Building Female-Enabling Work Infrastructure: Expand safe urban public transport, subsidized childcare centers, and flexible working arrangements to help young women enter and stay in the workforce.
- Expanding UrbanEmployment Frameworks: Implement target-driven urban employment programs to provide social security and contractual protections for gig workers and low-income urban youth.

Conclusion:

India's youth challenge is no longer about whether young people are educated or ready to work; it is about whether the domestic economy can create sufficient formal, high-quality jobs for them. Leaving nearly 80% of Gen Z

workers without social security and allowing graduate unemployment to exceed 30% threatens the nation's economic growth story. Ultimately, realizing the promise of India's demographic dividend requires transitioning from pre-election announcements to building strong, formal job markets for the next generation.

The E-Commerce Council of India (ECCI)

Context:

The Internet and Mobile Association of India (IAMAI) officially launched the E-Commerce Council of India (ECCI) in Bengaluru.



The E-Commerce Council of India (ECCI)

About The E-Commerce Council of India (ECCI):

What It Is?

- The E-Commerce Council of India (ECCI) is a dedicated, first-of-its-kind national industry council established to represent, unify, and advance the interests of India's digital commerce landscape. It acts as an umbrella body bridging private digital platforms, logistics firms, payment providers, and government regulators.
- Nodal Body: Founded under the aegis of the Internet and Mobile Association of India (IAMAI).
- Objectives: The core objective of the ECCI is to present a single, common voice for the digital trade ecosystem during policy conversations with the government.

Key Functions of the Council:

- TargetedPolicy Advocacy: Serves as a structured interface with policymakers, offering research and industry data to shape regulations around digital payments, consumer protection, and online commerce.
- Cross-Border Trade & Logistics Expansion: Focuses on simplifying cross-border e-commerce, helping Indian brands, exporters, and MSMEs expand their reach into international markets using global supply networks.
- MSME Enablement & Digital Onboarding: Develops frameworks to help micro, small, and medium enterprises (MSMEs) transition to digital models, giving them direct access to national and global supply chains.
- Fostering AI & Tech Integration: Sets guidelines and shares best practices for adopting cutting-edge technologies, such as AI-powered commerce, quick-commerce logistics, and digital payment infrastructure.
- Hosting the Indian E-Commerce Summit (IECS): Plans to host an annual national summit to bring together government representatives, tech founders, academic experts, and international partners to review digital trade developments.

Strategic Significance:

- Brings e-commerce, mobility, travel, D2C, and digital platforms under one umbrella to address common industry challenges.
- Promotes industry–government collaboration for stable policies, encouraging long-term investment and innovation in India's digital economy.

White Gold: India's Cotton Story

Context:

The PIB published the feature article White Gold: India's Cotton Story – From Seed to Shirt, highlighting India's cotton sector, recent policy initiatives, and its role in agriculture, textiles, and exports.



White Gold: India's Cotton Story

AboutWhite Gold: India's Cotton Story:

What It Is?

- White Gold: India's Cotton Story is a PIB feature highlighting the importance of cotton in India's agricultural, industrial, and export economy, along with recent government initiatives to improve productivity, quality, and global competitiveness.
- It showcases India's journey from traditional cotton cultivation to a modern, technology-driven and value-added cotton ecosystem under the vision of Atmanirbhar Bharat.

Key Characteristics:

- Global Cotton Leader: India is the only country cultivating all four recognized cotton species, ranking first in cultivated area and second in production and consumption.
- Economic Backbone: Supports nearly 6 million cotton farmers and provides employment to 40–50 million people across the textile value chain.
- Policy-Driven Growth: Backed by initiatives such as MSP procurement, Mission for Cotton Productivity, Kapas Kisan App, and Kasturi Cotton Bharat.
- Technology & Quality Focus: Promotes high-density planting, digital procurement, blockchain-based traceability, and climate-resilient cotton varieties.

Significance:

- Strengthens Rural Economy: Enhances farmer incomes, employment generation, and textile exports, reinforcing India's agricultural and manufacturing sectors.
- Boosts Global Competitiveness: Improves cotton quality, traceability, and value addition, strengthening India's position in the global textile and fibre market.

Polymer Banknotes in India: Advantages, Challenges & RBI Initiative

Context:

The Reserve Bank of India's (RBI) currency printing subsidiary—Bharatiya Reserve Bank Note Mudran Private Limited—invited global Expressions of Interest (EoI) for supplying opacified polymer substrate sheets with embedded security features.



Polymer Banknotes in India

AboutPolymer Banknotes in India: Advantages, Challenges & RBI Initiative:

What it is?

- Polymer or plastic banknotes are currency notes manufactured using specialized biaxially oriented polypropylene (BOPP) rather than traditional cotton-rag paper. Over 60 countries worldwide—led by Australia, which pioneered a complete series three decades ago—use polymer currency in some form.
- Designed primarily to modernize cash management, polymer notes offer enhanced physical durability, superior resistance to dirt and moisture, advanced anti-counterfeiting features, and longer circulation lifespans.

Key Data and Statistics on India's Currency System:

- Durability Advantage: Polymer banknotes last 2.5 to 4 times longer in active circulation than traditional cotton-paper notes.
- Manufacturing Cost Differential: Polymer notes cost 30% to 60% more to produce initially compared to paper banknotes, which can account for 20–24% of the face value for low-denomination notes.
- Digital Expansion vs. Cash Growth: The Unified Payments Interface (UPI) processes over 24,000 crore transactions annually (accounting for 85% of retail digital payments), yet the Currency-to-GDP ratio remains above 11%.
- Polymer Import Exposure: India relies on foreign imports for roughly 20% (one-fifth) of its domestic polypropylene consumption.

Advantages of Polymer Banknotes:

- Significantly Extended Lifespan: Because they do not absorb moisture, sweat, or oils, polymer notes resist tearing and remain clean far longer, especially in low-denomination high-frequency notes like 10 and 20.
- Reduced Long-Term Replacement Costs: Decreasing the frequency of note replacements lowers long-term manufacturing, transportation, and destruction costs for central authorities.
- Enhanced Anti-Counterfeiting Security: Polymer substrates allow complex security features like see-through windows, color-shifting inks, and intricate metallic overlays that are difficult to replicate.
- Lower OverallEnvironmental Footprint over Time: A study by TERI found that fewer total manufacturing cycles and reduced transport trips give polymer notes a smaller lifetime carbon footprint than paper notes, despite higher initial production impacts.

Key Challenges and Concerns Associated with Plastic Currency:

- High Initial Production Costs: Polymer notes require expensive, specialized substrates and anti-counterfeiting technology, raising costs significantly—especially for lower denominations where printing cost can rival face value.
- Petrochemical and Crude Price Vulnerability: Being derived from polypropylene, polymer note production costs are directly exposed to global crude oil price swings and West Asian supply disruptions.
- InfrastructureRecalibration Expenses: Rolling out polymer currency requires expensive modifications to ATMs, sorting hardware, and vending mechanisms across commercial banks and logistics firms.
- The Currency Demand Paradox: Investing heavily in physical cash infrastructure comes at a time when digital transactions via UPI and the Central Bank Digital Currency (e-Rupee) are rapidly reducing relative cash dependency.

Way Forward:

- Conducting Targeted Phased Pilots on Low Denominations: Limit initial polymer rollouts strictly to 10 and 20 notes in regions with diverse climatic conditions to verify actual lifecycle cost-savings.
- Expanding Domestic Polypropylene Refining Capacity: Accelerate domestic polypropylene production through key public and private refiners to reduce reliance on imported substrates.
- Establishing Closed-LoopRecycling Infrastructure: Build specialized recycling systems to melt down retired polymer notes into industrial plastic products, minimizing environmental waste.
- Balancing Physical Currency and Digital Payments: Align cash production with the expansion of the digital rupee and UPI to ensure cost-effective currency management.

Conclusion:

The RBI's renewed push for polymer currency represents a pragmatic step toward building a cleaner, more durable cash ecosystem for an economy with over 41 lakh crore in circulation. While high initial production costs and petrochemical import dependencies pose real challenges, the substantial lifecycle savings on low-denomination notes make a strong economic case. Ultimately, balancing physical polymer currency with rapid digital adoption will ensure India maintains an efficient, secure, and future-ready monetary framework.

The Nifty500 Ahimsa Index

Context:



NSE Indices Limited, in collaboration with the Ahimsa Foundation, launched the Nifty500 Ahimsa Index.

- It tracks 326 companies from the Nifty 500 that follow Ahimsa (non-violence towards animals)

The Nifty500 Ahimsa Index

AboutThe Nifty500 Ahimsa Index:

What It Is?

- The Nifty500 Ahimsa Index is India's first specialized, rules-based equity index designed specifically to screen and track companies free from animal cruelty. It offers ethical investors a structured way to direct capital away from industries that cause harm to animals.

- Launched By: Created by NSE Indices Limited in strategic partnership with the Ahimsagain Foundation, utilizing the foundation's proprietary Ahimsa Investment Movement (AIM) screening framework.
- Aim: To provide retail and institutional investors with a transparent benchmark that aligns financial portfolios with compassion and ethical values, while serving as an underlying asset base for passive investment products like Mutual Funds, Exchange-Traded Funds (ETFs), and index funds.

Key Features of the Index:

- The AIM Banding Framework: Evaluates the products, services, and operational models of Nifty 500 companies, categorizing them into Green (fully aligned), Orange (partially aligned), and Red (non-compliant) bands. Only Green-band companies qualify for inclusion.
- Selective Sector Inclusions: Heavily features top-performing Information Technology (IT) service providers, software exporters, automobile manufacturers, capital goods firms, and telecommunications leaders.
- Strict Sector Exclusions: Excludes companies involved in meat, dairy, poultry, leather, cosmetics, fashion using wool/leather, and pharmaceutical firms engaging in animal testing.
- Exclusion of Financial Services & Reliance Group: Notably excludes all commercial banks and major Non-Banking Financial Companies (NBFCs) due to their financing of non-compliant sectors, as well as almost all Reliance Group entities.
- Free-Float Market Capitalization Weighting: Base-dated to April 1, 2016 (with a base value of 1,000), weighted by free-float market capitalization, and reconstituted on a semi-annual basis.

Significance:

- Expands Ethical Investing: Goes beyond traditional ESG by adding animal welfare and non-violence as investment screening criteria.
- Promotes Values-Based Investing: Encourages ethical investment products and supports growing demand from socially conscious investors.

The EPFO 3.0 Reforms

Context:

The Employees' Provident Fund Organisation (EPFO) announced its upcoming EPFO 3.0 reform phase, moving beyond the claims-focused EPFO 2.0 framework.

The EPFO 3.0 Reforms

About The EPFO 3.0 Reforms:

What It Is?

- EPFO 3.0 represents the next generation of social security and retirement fund administration in India. It transitions the EPFO from a traditional formal-sector provident fund manager into a universal, multi-source social security platform capable of managing pension drawdowns, unorganized sector contributions, and gig-economy integrations.
- Aim: The central objective of EPFO 3.0 is to eliminate pension exclusion by bringing unorganized sector workers, construction workers (BOCW), and gig/platform workers into a structured social security framework, while offering flexible, inflation-linked retirement solutions for all Indian workers.

Key Features of EPFO 3.0:

- Core Banking Solution (CBS) Tech Integration: Implements an RBI-regulated Core Banking Solution software as its core engine. This replaces fragmented databases with a real-time, centralized transaction system built to seamlessly handle micro-transactions for over 60 crore workers.
- Target Retirement Sum (TRS) Framework: Replaces rigid retirement payouts with a defined contribution system. Members set a personalized Target Retirement Sum (TRS) based on their desired pension goal and retirement age, tracking their real-time progress via personalized dashboards.
- Dual Retirement Conversion Options: Upon reaching retirement, accumulated funds can be converted into either a traditional annuity or a flexible Systematic Withdrawal Plan (SWP), allowing retirees to adjust monthly payouts according to their changing financial needs.

- Gig and Platform Worker Coverage: Operationalizes the Code on Social Security by integrating gig workers into the EPFO network, capturing 1–2% aggregator turnover contributions through automated split-payment systems.
- One-to-Many UAN Mapping: Enables a single Universal Account Number (UAN) to link concurrently with multiple employers, aggregators, and digital platforms, maintaining an organized record of all contributions without creating duplicate accounts.
- Multi-Source & Third-Party Contributions: Allows provident fund balances to be built through diverse sources, accepting co-contributions from workers, employers, government subsidies, CSR funds, donor organizations, and consumer tips integrated into food or delivery apps.

Significance:

- ExpandsSocial Security: Extends retirement and social security coverage to informal, construction, and gig workers through flexible contributions.
- Modernizes Retirement Planning: Introduces flexible withdrawals and digital pension planning tools, enabling better long-term financial security.

The Updated Index of Core Industries (ICI)

Context:



The Union Government released an updated series of the Index of Core Industries (ICI), introducing a revised base year of 2022–23 (replacing 2011–12).

The Updated Index of Core Industries (ICI)

AboutThe Updated Index of Core Industries (ICI):

What It Is?

- The Index of Core Industries (ICI) is a monthly production volume index that measures the combined performance of key infrastructure-supportive core sectors in India. It acts as a high-frequency lead indicator for the broader Index of Industrial Production (IIP), in which these core sectors hold a significant combined weightage.
- Published By: The index is compiled and published monthly by the Office of Economic Adviser (OEA), Department for Promotion of Industry and Internal Trade (DPIIT), under the Ministry of Commerce and Industry.
- Aim: The revision aims to align the core sector gauge with structural shifts, modern consumption patterns, and updated macroeconomic metrics—including national accounts (GDP/GVA), the Consumer Price Index (CPI), and the IIP—offering a more accurate view of contemporary industrial activity.

Key Changes in the Updated Series:

- Base Year Update: Updated to 2022–23=100 from the outdated 2011–12 base year, better reflecting present-day manufacturing and industrial dynamics.
- Expansion to Nine Sectors: Expanded from 8 to 9 core industries through the addition of Iron Ore. Iron ore was added due to its critical role as an industrial input, receiving a weight of 4.905%.
- Gross Steel Production Accounting: Replaced the previous net production metric for steel with gross production data, establishing procedural consistency with the IIP framework.
- Elimination of Double-Counting in Coal: Narrowed the coal index to track raw coal exclusively, excluding coal middlings and washed coal since both are derived from raw coal.
- Significant Weight Redistribution: Rebalanced sector weights using pro-rata distributions derived from the 2022–23 IIP series:
- Electricity: Gained significant weightage, becoming the largest sector at 30.932% (up from 19.85%).
- Refinery Products: Decreased to 22.572% (down from 28.04%).
- Coal & Natural Gas: Reduced to 5.596% (from 10.33%) and 3.841% (from 6.88%), respectively.
- Fertilizers: Slightly increased to 2.731% (from 2.63%).

Significance:

- Updating the base year to 2022–23 improves the accuracy of industrial output and economic assessment.
- Aligns the ICI with IIP, GDP, WPI, and Producer Price Indices, supporting better economic and policy decisions.

India's Gen Z and Unemployment

Context:



An analysis of the PLFS 2023–24 by experts highlights a widening job transition crisis, with India's educated Gen Z struggling to secure formal employment despite the country's demographic dividend.

India's Gen Z and Unemployment

AboutIndia's Gen Z and Unemployment:

What it is?

- The Gen Z generation in India comprises working-age individuals aged 15 to 26 years (born between 1997 and 2012), representing a talent pool of roughly 29.94 crore people.
- Gen Z unemployment describes a structural failure where young jobseekers face high unemployment rates, delayed transitions from education to employment, and widespread absorption into informal or unpaid labor.

Key Data and Statistics on Gen Z Unemployment:

- Low Formal Wage Absorption: Only 14.8% of young Gen Z males and 4.7% of Gen Z females are employed as regular wage earners, with the remainder working as casual laborers, unpaid family workers, or performing unpaid domestic duties.
- HighRate of Informality: Approximately 79.9% of Gen Z workers completely lack social security coverage, and only 14.1% possess a formal employment contract.
- Depressed Labour Force Participation (LFPR): Gen Z LFPR sits at 41.7% (versus 75% for Millennials), dropping sharply among young women to 28% in rural areas and 21.1% in urban areas.
- Extreme Domestic Burden on Women: About 27.1% of Gen Z females are engaged exclusively in unpaid domestic duties, compared to merely 0.32% of Gen Z males.

Reasons Behind Unemployment Among Indian Gen Z:

- Education-to-Work Mismatch: The higher education system prioritizes academic degrees over practical skills required by modern industries, leading to credential inflation without job readiness.
- Disrobing Jobs ThroughAutomation and AI: The rapid integration of artificial intelligence and automated processes is changing entry-level roles, cutting traditional entry-level white-collar and administrative positions.
- Structural Barriers and Social Norms for Women: Lack of affordable childcare, safety concerns during commutes, mobility constraints, and unequal domestic expectations keep millions of educated young women out of the paid workforce.
- Informalization of Formal Sectors: Industrial manufacturing and commercial entities increasingly rely on contract work, gig roles, and informal hiring, reducing the availability of stable, long-term jobs with social security.

Implications of Gen Z Job Crisis:

1. On Society:

- Rising Social Frustration and Unrest: A lack of stable employment options creates widespread economic anxiety, leading to labor strikes and public protests over job terms.
- Erosion of HouseholdFinancial Investment: Families stretch their financial resources to fund higher education, but low returns on educational investments cause widespread frustration and strain household budgets.

- Reinforcement of Gender Inequality: High barriers to formal employment push young women back into unpaid domestic labor, hindering social progress and women's economic independence.

2. On the Economy:

- Squandering the Demographic Dividend: Failing to transition young people into productive work risks turning a potential economic advantage into a long-term fiscal burden.
- Depressed Household Consumption Demand: Widespread informal labor and low wages limit the purchasing power of young adults, suppressing long-term domestic consumer demand.
- Low Productivity Traps: Absorbing educated youth into low-skilled casual labor or unpaid family roles suppresses national productivity growth and slows industrial innovation.

Way Forward:

- Expanding Labor-Intensive Manufacturing: Shift industrial policies to support labor-intensive sectors like textiles, food processing, and construction to absorb non-salaried and casual workers into formal roles.
- Mandating Direct Apprenticeship Pathways: Establish structured school-to-work pipelines by linking university degrees directly with industry-led apprenticeships and formal hiring incentives.
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- Expanding UrbanEmployment Frameworks: Implement target-driven urban employment programs to provide social security and contractual protections for gig workers and low-income urban youth.

Conclusion:

India's youth challenge is no longer about whether young people are educated or ready to work; it is about whether the domestic economy can create sufficient formal, high-quality jobs for them. Leaving nearly 80% of Gen Z workers without social security and allowing graduate unemployment to exceed 30% threatens the nation's economic growth story. Ultimately, realizing the promise of India's demographic dividend requires transitioning from pre-election announcements to building strong, formal job markets for the next generation.

The Employees' Provident Funds (EPF) Scheme, 2026

Context:

The Ministry of Labour and Employment has notified the Employees' Provident Funds (EPF) Scheme, 2026, replacing the EPF Scheme, 1952, under the implementation of the Code on Social Security, 2020.

The Employees' Provident Funds (EPF) Scheme, 2026

About The Employees' Provident Funds (EPF) Scheme, 2026:

What is it?

- The Employees' Provident Funds (EPF) Scheme, 2026 is India's new statutory provident fund framework replacing the Employees' Provident Funds Scheme, 1952.
- It has been notified under the Code on Social Security, 2020 to modernize provident fund administration while retaining existing retirement benefits.
- Nodal Ministry: Ministry of Labour and Employment.

Executive authority: Employees' Provident Fund Organisation (EPFO)

Aim:

- To provide financial security and retirement savings for employees.
- To implement the Code on Social Security, 2020 through a modernized provident fund framework.

Key Features:

1. Replaces the 1952 Scheme:

- Supersedes the Employees' Provident Funds Scheme, 1952.
- Brings provident fund administration under the Code on Social Security, 2020.

2. Seamless Continuity:

- Existing EPF subscribers automatically continue as members.
- No fresh enrolment or transfer of accumulated balances is required.

3. Contribution Rules:

- Employer and employee continue to contribute 12% of wages (10% for notified establishments).
- Mandatory contribution applies only up to the statutory wage ceiling (15,000/month).
- Mandatory contribution remains 1,800 each (12% of 15,000).

4. Voluntary Higher Contributions:

- Employees may voluntarily contribute above the wage ceiling or at rates exceeding 12%.
- Employers may make matching voluntary contributions.
- Such additional contributions can be reduced or discontinued later.

5. Simplified Withdrawal Categories:Earlier 13 categories have been consolidated into three:

- Essential Needs – illness, education, marriage.
- Housing Needs – purchase, construction, home loan repayment, renovation.
- Special Circumstances – specified emergencies.

6. Minimum Balance Requirement:

- Members must retain 25% of total contributions as a minimum retirement corpus.
- Remaining eligible balance can be withdrawn subject to scheme conditions.

7. Withdrawal Provisions:

- Illness: Up to 100% of eligible balance after 12 months of membership.
- Education: Withdrawal permitted after 12 months (maximum 10 times).
- Marriage: Up to 100% of eligible balance (maximum 5 withdrawals).
- Housing: Up to 75% of total balance after 12 months (maximum 5 withdrawals).

8. Protection for Contract Workers:

- Introduces the concept of Principal Employer.
- Principal employer remains ultimately responsible for PF contributions where contractors fail to comply.

9. Employer Compliance:

- Employers must submit: Aadhaar, PAN, Universal Account Number (UAN), Wage details, Monthly and event-based statutory returns.

10. Digital Governance

- Greater emphasis on Aadhaar-linked UAN and bank accounts.
- Supports faster withdrawals and portability.
- EPFO is also enabling UPI-based withdrawals and WhatsApp-based member services.

11. International Workers

- Existing provisions for international workers continue.
- Existing international members remain covered under the new framework.

The RBI Scam Compensation Framework

Context:



The Reserve Bank of India (RBI) has issued final amendments to its Limiting Customer Liability in Digital Transactions framework.

- Effective January 1, 2027, the one-year pilot expands protection against social engineering scams and introduces monetary compensation for victims of small-value digital fraud.

The RBI Scam Compensation Framework

About The RBI Scam Compensation Framework:

What It Is?

- The framework is a regulatory financial safety net designed to protect bank customers from digital payment frauds. It upgrades the RBI's 2017 circular, which only protected against unauthorised hacking hacks.
- The modern mechanism introduces Fraudulent Electronic Banking Transactions (EBTs) as a legal concept, making individuals eligible for reimbursement even if they accidentally shared credentials due to deception or coercion.

Regulator: The Reserve Bank of India (RBI).

Aim:

- To provide economic relief to victims of modern digital scams, including digital arrests, phishing, and fraudulently stolen One-Time Passcodes (OTPs).
- To shift the legal burden of proof onto the bank, forcing financial institutions to actively prove customer negligence rather than automatically denying fraud claims.

Key Features and Rules of the Policy:

The Payout Matrix:

- The Payout Formula: Individual victims (including sole proprietors) suffering scam losses up to 50,000 can claim 85% of their net loss, capped at a maximum of 25,000.
- The Breakpoint: For losses below 29,412, victims get exactly 85% of the amount. For losses between 29,412 and 50,000, the payout is capped at a flat 25,000.
- The Cap: Scams exceeding 50,000 are completely excluded from this specific reimbursement track.
- Frequency: This financial remedy can be claimed only once in a customer's lifetime. For joint accounts, only one holder may file the claim.

The Three-Way Cost-Sharing Model:

- The compensation cost does not fall solely on the customer's bank. Instead, it is co-funded across a multi-party ledger:
- The RBI Share: Contributes roughly 75% of the payout amount.
- The Remitter (Customer's) Bank: Contributes half of the remaining balance.
- The Beneficiary (Receiver's) Bank: Contributes the other half of the remaining balance. For cross-border scams, the remitter bank covers this share.

Defining Customer vs. Bank Negligence:

- Customer Negligence (Exclusions): Customers are ineligible for compensation if they ignore clear, directed security alerts or fail to link their current phone number/email address with the bank, which blocks real-time fraud warnings.
- Bank Negligence (Inclusions): Deemed to occur if a bank fails to send mandatory transaction alerts, lacks a 24×7 fraud-reporting infrastructure, or fails to act promptly once notified.
- Third-Party Breaches: Customers are not held liable for security leaks occurring elsewhere in the ecosystem, such as at a payment gateway, aggregator, or telecom provider.

Mandatory Timelines and Grievance Tracks:

- The 5-Day Reporting Rule: To qualify for a payout, the customer must report the fraud within 5 calendar days of its occurrence to both their bank and the National Cyber Crime Helpline (1930).
- Resolution Turnaround: Banks must resolve domestic digital fraud cases within 45 calendar days and cross-border cases within 60 calendar days. Reversals must be value-dated to the original transaction date so the customer loses no interest.
- Credit Card Shadow Reversal: For credit card fraud, banks must issue a temporary shadow reversal of the disputed funds within 5 calendar days of the report so the user does not incur interest charges while the investigation is underway.
- The 500 Alert Rule: Banks are required to send instant, cost-free SMS alerts for all electronic transactions exceeding 500 to maintain a reliable communication channel for users without internet connectivity.

The Protection & Indemnity (P&I) Insurance Product

Context:



The Department of Financial Services (DFS), Ministry of Finance, launched India's first sovereign-backed Protection & Indemnity (P&I) insurance product under the Bharat Maritime Insurance Pool (BMIP).

AboutThe Protection & Indemnity (P&I) Insurance Product:

What It Is?

- It is India's first sovereign-backed Protection & Indemnity (P&I) marine insurance product designed to offer comprehensive financial protection to shipowners and charterers against third-party liabilities incurred during maritime operations.

Designed & Managed Under

- Architect / Underwriter: Designed by The New India Assurance Company Limited.
- Parent Scheme: Operates under the Bharat Maritime Insurance Pool (BMIP), an initiative operationalized by the Department of Financial Services (DFS) with a sovereign guarantee backing.
- Aim: To establish self-reliant domestic marine risk management capabilities, provide continuous third-party liability coverage, and protect Indian shipping interests against geopolitical disruptions and exorbitant foreign insurance premiums.

Key Features:

- High Indemnity Limit:Provides a combined indemnity cover of up to USD 1.5 billion, backed by a sovereign guarantee, ensuring financial protection against large-scale maritime liability claims.
- Comprehensive Third-Party Coverage:Covers crew and cargo liabilities, marine pollution, oil spill compensation, and wreck removal costs, reducing financial risks arising from maritime accidents.
- 24×7 Global Port Network:Supported by a round-the-clock international network of port correspondents, enabling rapid legal assistance, claims settlement, and emergency response worldwide.
- ExpansionBeyond War Risk: Extends BMIP's coverage beyond Cargo and Hull War Risks to include comprehensive Protection & Indemnity (P&I) liabilities for Indian shipping.

Significance:

- Reduces dependence on foreign insurers and international P&I Clubs, retaining insurance premiums and maritime risk management within India's domestic financial ecosystem.
- Domestic war-risk premiums have fallen 35–40% since BMIP's launch, reducing logistics costs while improving India's capacity to manage geopolitical disruptions independently.

The Coal Exchange Rules, 2026

Context:



Union Minister of State for Coal and Mines, provided details in the Lok Sabha regarding the Coal Exchange Rules, 2026.

The Coal Exchange Rules, 2026

About The Coal Exchange Rules, 2026:

What It Is?

- The Coal Exchange Rules, 2026 establish a statutory regulatory and operational framework to set up and manage Coal Exchanges—centralized electronic trading platforms where buyers and sellers transact, trade, and enter into delivery-based spot contracts for coal, lignite, and their processed forms.
- Governing Legislation: Notified under Section 18B of the Mines and Minerals (Development and Regulation) Act, 1957 (MMDR Act).
- Aim: To transition India's coal sector from legacy, non-market allocation models to a transparent, competitive, and market-driven electronic ecosystem—ensuring fair price discovery, information symmetry, and efficient supply delivery.

Key Features:

- Statutory Oversight by CCO: The Coal Controller Organisation (CCO) evaluates, approves, renews, or revokes exchange registrations and exercises administrative control over bidding mechanisms, transaction fee ceilings, and bye-laws.
- Open Market Participation: Allows any entity—including commercial miners, captive mine owners, Public Sector Undertakings (PSUs), and non-regulated small and medium consumers—to trade delivery-based contracts.
- Dynamic Price & Quality Adjustment: Prices are discovered competitively through CCO-approved algorithms. Final trade settlements are dynamically adjusted based on actual coal quality certifications issued by accredited coal sampling agencies.
- Settlement Guarantee Fund (SGF): Exchanges must operate a dedicated Settlement Guarantee Fund managed by an independent committee, keeping at least 50% invested in safe, liquid instruments to manage counterparty risk.
- Market Surveillance &Audit Trail: Mandates a Market Surveillance Committee and a dedicated surveillance department to monitor daily trading, maintain automated audit trails for all bids, conduct CISA-certified IT system security audits, and operate a disaster recovery site.
- Grievance Redressal & Interventions: Establishes a dedicated Grievance Redressal Forum, empowering the CCO to issue interim orders, conduct inspections, and intervene to prevent cartelization, insider trading, or market manipulation.

Significance:

- Transparent Price Discovery: Introduces competitive e-bidding, enabling market-based coal prices while reducing intermediary costs.
- Efficient Coal Distribution: Provides a nationwide spot platform for buying and selling coal, improving logistics, reducing regional shortages, and strengthening energy security.

The DAANVEER initiative

Context:

Shri Vivek Bharadwaj, Secretary, Ministry of Panchayati Raj, launched the DAANVEER initiative in New Delhi.

- It is a digital platform that enables citizens, organizations, and the Indian diaspora to donate computer hardware and other digital equipment directly to rural local bodies.



The DAANVEER initiative

About The DAANVEER initiative:

What It Is?

- DAANVEER is a technology-enabled institutional framework and citizen participation platform designed to strengthen the digital infrastructure of Gram Panchayats across India. Carrying the tagline Give Back

to Your Village, it transforms individual and institutional philanthropy into a structured, accountable, and direct mechanism for upgrading rural public institutions.

- Nodal Ministry: Ministry of Panchayati Raj (MoPR), Government of India.
- Aim: To bridge digital infrastructure gaps in India's nearly 2.5 lakh Gram Panchayats, transforming local governance units into digitally equipped, connected, and future-ready service delivery hubs in alignment with the vision of Viksit Bharat.

Key Features:

- Integration with the 'Meri Panchayat' App: Citizens can participate entirely voluntarily by logging into the Meri Panchayat mobile application, where eligible Gram Panchayats list their specific technology needs.
- E-Commerce Integration via DigiHaat: Connects directly with the DigiHaat marketplace, allowing donors to select pre-approved, state-specific computer bundles without needing to manually handle procurement or shipping.
- End-to-End Digital Transparency: Automatically populates delivery details and provides donors with real-time tracking from dispatch to final installation at the Panchayat office.
- Digital Appreciation System: Donors receive an officially verified digital certificate of appreciation upon successful installation, establishing a credible paperless audit trail.
- Synergy with Central Digital Ecosystems: Integrates with existing rural governance portals—such as e-GramSwaraj, Sabha Saar, AuditOnline, and Gram Manchitra—ensuring newly donated hardware is immediately put to functional use.

Significance:

- Strengthens Rural Governance: Improves digital service delivery, financial transparency, and administrative efficiency in Gram Panchayats.
- PromotesCommunity Participation: Enables the Indian diaspora and citizens to directly support digital infrastructure in their native villages.

The Public Examinations (Prevention of Unfair Means) Amendment Bill, 2026

Context:

Union Minister of State for Personnel, Public Grievances and Pensions introduced The Public Examinations (Prevention of Unfair Means) Amendment Bill, 2026 in the Lok Sabha.



The Public Examinations (Prevention of Unfair Means) Amendment Bill, 2026

AboutThe Public Examinations (Prevention of Unfair Means) Amendment Bill, 2026:

What It Is?

- The Public Examinations (Prevention of Unfair Means) Amendment Bill, 2026 is an amending piece of central legislation that seeks to overhaul the existing Public Examinations (Prevention of Unfair Means) Act, 2024.
- Aim: To deter individuals, organized syndicates, service providers, and coaching mafias from compromising the integrity of competitive tests.

Key Amendments & Changes Introduced:

- Special Task Force (STF) & Timelines: Empowers the Central Government to constitute a specialized Special Task Force (STF) to investigate paper leaks, mandating that all investigations be completed within 2 months.
- Mandatory Special Fast Track Courts: Directs every State and Union Territory administration, in consultation with the Chief Justice of the concerned High Court, to designate a Court of Session as a Special Fast Track Court to try offenses under the Act on a day-to-day basis.

Strict Trial & Appeal Deadlines:

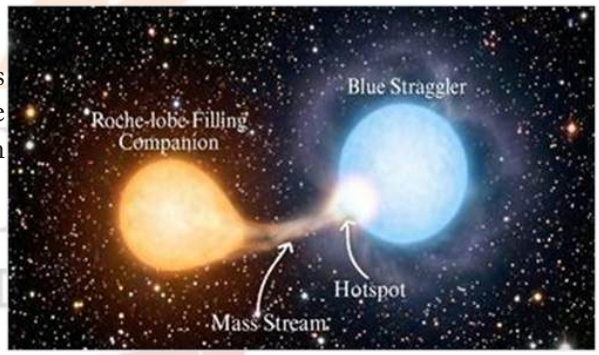
- Trials must be concluded within 3 months from the filing of the chargesheet.
- Appeals lie before a two-judge bench of the High Court, which must dispose of them within 3 months of admission. Appeals must be filed within 30 days, with an outer threshold cap of 90 days.
- Extended Vendor Debarment: Doubles the period for which guilty service providers are banned from handling public examination responsibilities from 4 years to 8 years.

Key Comparisons: Act (2024) vs. Amendment Bill (2026)

Parameter / Offense	Existing Provision under the 2024 Act	Proposed Provision under the 2026 Amendment Bill
Use of Unfair Means (Individuals)	Imprisonment between 3 to 5 years; fine up to 10 lakh.	Imprisonment between 5 to 10 years; fine up to 50 lakh.
Malpractice by Service Providers	Fine up to 1 crore.	Fine up to 5 crore (plus recovery of exam costs).
Involvement of Persons-in-Charge / Management	Imprisonment between 3 to 10 years; fine of 1 crore.	Minimum 5 years imprisonment; fine of 5 crore.
Organised Exam Crimes	Imprisonment between 5 to 10 years; fine not less than 1 crore.	Minimum 7 years imprisonment; minimum fine of 10 crore.
Service Provider Debarment Period	Debarred for 4 years.	Debarred for 8 years.
Investigative Agency Framework	Transfer limited to existing central agencies (CBI, etc.).	Option to constitute a dedicated Special Task Force (STF) with a strict 2-month probe deadline.
Judicial Mechanism & Trial Timeline	Normal judicial process without fixed trial deadlines.	Mandatory Special Fast Track Courts with day-to-day trials completed within 3 months.

Blue Straggler Star (BSS)

Context:



Indian astronomers from the Indian Institute of Astrophysics (IIA), along with international collaborators, have reported the rare discovery of a Blue Straggler Star (BSS) actively forming in the binary system TIC 327546480.

Blue Straggler Stars (BSS)

AboutBlue Straggler Stars (BSS):

What It Is?

- A Blue Straggler Star (BSS) is an unusually hot, luminous, blue, and massive star found within old star clusters (globular or open clusters).
- While standard theories of stellar evolution dictate that stars of such high mass should have burned through their nuclear fuel and evolved into white dwarfs or red giants long ago, these stars appear much younger than the surrounding cluster population—effectively lagging behind or straggling in their evolutionary timeline.

Origin & How They Are Formed:

First observed by Allan Sandage in 1953 in the globular cluster M3, Blue Stragglers are formed when an older star gains extra hydrogen fuel, essentially resetting its nuclear clock through two primary mechanisms:

1. Mass Transfer in Binary Systems (Roche Lobe Overflow): In a close binary system, one star expands beyond its gravitational boundary (its Roche lobe) as it ages. Matter leaks from this donor star onto its smaller companion. Accreting this extra mass causes the companion to grow hotter, bluer, and more massive, spinning up rapidly as it transforms into a BSS.
2. Stellar Collisions / Mergers: In dense star cluster cores, direct physical collisions or mergers between two stars can fuse their mass into a single, highly energetic rejuvenated star.

Key Features of Blue Stragglers:

- Defies Normal Stellar Ageing: Blue Straggler Stars (BSS) appear younger and hotter than other stars in the same ancient cluster, even though they formed at the same time.
- Semi-Detached Binary System: In TIC 327546480, the smaller companion star continuously transfers gas to the larger Blue Straggler Star, causing it to gain mass.
- HighRotation Due to Accretion: As the BSS receives gas from its companion, it also gains angular momentum, making it spin much faster.
- X-Ray Evidence of Mass Transfer: The falling gas heats up when it strikes the BSS, producing strong X-rays that confirm active mass transfer.
- Long-Term Rejuvenation: Scientists estimate that this mass transfer began about 5.46 billion years ago and is still continuing, keeping the star looking young.

Significance:

- The discovery directly shows a Blue Straggler Star gaining mass from a companion, providing strong evidence that mass transfer can rejuvenate stars.
- The system helps scientists better understand binary star evolution, mass transfer, and stellar life cycles, improving models of how stars evolve across the universe.

Ancient Buddhist Site of Sarnath Inscribed in the UNESCO World Heritage List

Context:

At the 48th Session of the World Heritage Committee in Busan, South Korea, India's official nomination Ancient Buddhist Site of Sarnath was inscribed on the UNESCO World Heritage List.

- It marks India's 45th World Heritage property, placing the nation 6th globally and 2nd in the Asia-Pacific region for total UNESCO sites.



Ancient Buddhist Site of Sarnath Inscribed in the UNESCO World Heritage List

AboutAncient Buddhist Site of Sarnath Inscribed in the UNESCO World Heritage List:

What It Is?

- The Ancient Buddhist Site of Sarnath is a serial World Heritage property preserving one of the four principal destinations of Buddhist pilgrimage.
- It was inscribed under UNESCO criteria (iii) for its enduring spiritual tradition and criteria (vi) for its direct association with pivotal events in the life of Gautama Buddha—specifically his first sermon (Dharmachakra pravartana) and the establishment of the Buddhist Sangha.

Geographical Location:

Located within Varanasi, Uttar Pradesh, India. The serial property comprises two primary components:

1. Chaukhandi Stupa
2. Archaeological Remains of Sarnath (encompassing Dhamekh Stupa, Dharmarajika Stupa, Mulagandhakuti Vihara, and the Ashokan Pillar site).

History & Sacred Context:

- Ancient Nomenclature: Known historically in Buddhist literature as Rishipatana, Ishipatana, and Mrigadava.
- The First Sermon (6th Century BCE): Gautama Buddha visited Sarnath in the 6th century BCE to deliver his first sermon, Turning of the Wheel of the Law (Dharmachakra pravartana), introducing the principles of the Noble Eightfold Path and the concept of Triratna.
- Multifaceted Patronage & Decline: Evolved over centuries through royal, monastic, and lay patronage from the pre-Mauryan era (5th–4th century BCE) up to its decline and destruction in the 12th century CE.
- Rediscovery & ASI Excavations: Fell into obscurity until its rediscovery in the 18th century. For over 150

years, the Archaeological Survey of India (ASI) has conducted excavations revealing a continuous, stratified settlement spanning 16 centuries.

Architectural & Archaeological Features:

- Dhamekh & Chaukhandi Stupas: Massive structural stupas marking sacred spots where the Buddha met his first disciples and delivered core teachings.
- Mauryan Ashokan Pillar &Lion Capital: Features the historic Mauryan-era pillar carved from polished sandstone. Its polished Lion Capital, excavated during 1904–1906, was later adopted as the National Emblem of India.
- Monastic Ensembles (Viharas): Preserved brick foundations of ancient monasteries, temples, and Mulagandhakuti Vihara, showcasing structural evolution across Mauryan, Kushan, and Gupta periods.
- Classic Gupta Art: Yielded world-famous Masterpieces of Gupta art, including the Dharmachakrapravartan Buddha statue, currently housed at India's earliest site museum established in Sarnath in 1904.

The Corporate Mitra Scheme

Context:

The Indian Institute of Corporate Affairs (IICA) Shillong organized an awareness webinar on the Corporate Mitra Scheme for youth, students, and MSMEs in Arunachal Pradesh.

The Corporate Mitra Scheme

About The Corporate Mitra Scheme:

What It Is?

- The Corporate Mitra Scheme is a central initiative designed to create a certified cadre of trusted, trained para-professionals known as Corporate Mitras. These individuals provide accessible and affordable business compliance, accounting, and advisory services to Micro, Small, and Medium Enterprises (MSMEs).
- Ministry: Ministry of Corporate Affairs (MCA), Government of India.
- Aim: To empower MSMEs in Tier-2 and Tier-3 cities by reducing their regulatory and secretarial compliance burden, enhancing Ease of Doing Business (EODB), and equipping young graduates with practical, industry-relevant skills to foster employment.

Key Features of the Scheme:

- Target Capacity: Initial pan-India target of 2,000 participants, with 200 seats reserved exclusively for the North Eastern Region (NER).
- Financial Concessions for NER: Candidates from the North Eastern states receive a 50% fee concession on registration and training fees.
- Scope of Services: Accredited Corporate Mitras handle non-core business operations for MSMEs, including regulatory filings, secretarial compliance, basic accounting, tax filings, financial documentation, and governance-related tasks.
- Digital Training Integration: The formal 'Corporate Mitra' training course is hosted and accessible through the government's Swayam Plus educational portal.
- Skill Development Bridge: Bridges the gap between academic education and industry needs by training young graduates to work as qualified para-professionals for local businesses.

Significance:

- By outsourcing compliance to certified Corporate Mitras, MSMEs can reduce regulatory burdens, avoid penalties, and focus on business growth.
- Creates skilled employment for graduates in the Northeast by training them as Corporate Mitras, supporting entrepreneurship and Viksit Bharat @ 2047.

The BHAVYA - Rasayan Scheme



Context:

The Union Cabinet, chaired by Prime Minister, approved the Bharat Audyogik Vikas Yojana Rasayan (BHAVYA – Rasayan) Scheme.

The BHAVYA - Rasayan Scheme

AboutThe BHAVYA – Rasayan Scheme:

What It Is?

- BHAVYA – Rasayan is a central sector industrial park development scheme focused on expanding India's chemical and petrochemical manufacturing It provides capital support to build modern plug-and-play common infrastructure facilities and basic utilities for chemical manufacturing units.
- Ministry: Department of Chemicals and Petrochemicals, Ministry of Chemicals and Fertilizers.
- Implementation Period: 5 years, running from FY 2026–27 to FY 2030–31.
- Aim: To build an integrated, eco-friendly, and cost-competitive manufacturing ecosystem for the chemical industry, lowering logistics costs, attracting domestic and foreign direct investments (FDI), driving import substitution, and strengthening India's role in Global Value Chains (GVCs).

Key Features of the Scheme:

- Total Financial Allocation: Total outlay of 3,030 crore, comprising 3,000 crore for Common Infrastructure Facilities & Basic Utilities and 30 crore for administrative expenditure.
- ThreeDedicated Chemical Parks: Sets up three world-class, specialized chemical industrial parks across participating states.
- Central Grant & State Funding Pattern: The Centre will offer financial support of up to 1,000 crore per park, provided the concerned state government contributes a minimum matching grant of 500 crore.
- Selection via Challenge Route: State government sites will be evaluated and chosen competitively using a Challenge Route selection framework.
- Minimum Contiguous Land Norms: Participating states must provide a minimum contiguous area of 8 sq. km. (2,000 acres) of encumbrance-free land for each park.
- Plug-and-Play Infrastructure & Utilities: Parks will equip industrial occupants with state-of-the-art shared facilities, including:
- Common Effluent Treatment Plants (CETP)
- Treatment, Storage, and Disposal Facilities (TSDF) for hazardous waste
- Solvent recovery and distillation plants
- Steam generation and distribution systems
- Interconnected industrial pipeline networks, logistics, and warehousing facilities.

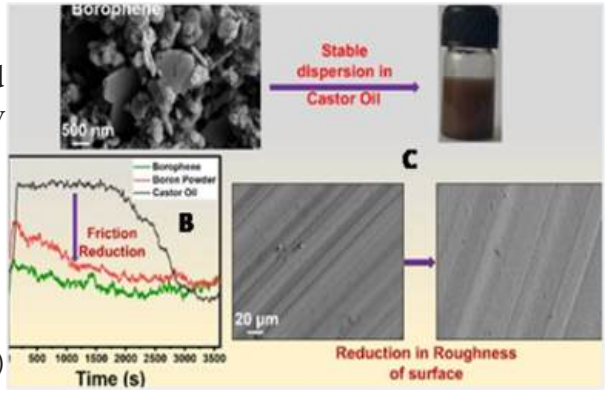
Significance:

- Chemical clusters strengthen the domestic supply of raw materials for sectors like agriculture, textiles, and electronics, reducing import dependence.
- Shared CETPs and hazardous waste facilities improve environmental compliance, lower costs for industries, reduce pollution, and support the Viksit Bharat 2047

Borophene

Context:

Scientists at the Institute of Advanced Study in Science and Technology (IASST), Guwahati, achieved a breakthrough by using borophene as a bio-lubricant additive in castor oil.



Borophene

AboutBorophene:

What It Is?

- Borophene is an ultra-thin, two-dimensional (2D)

crystalline allotrope of boron. Consisting of a single-atom-thick layer of boron atoms, it is often referred to as the boron equivalent of graphene, possessing exceptional mechanical strength, flexibility, and electronic conductivities.

How It Is Formed?

- Unlike graphene (which can be mechanically exfoliated from bulk graphite), borophene does not exist naturally in bulk form and must be synthesized artificially:
- Chemical Vapor Deposition (CVD) / Molecular Beam Epitaxy (MBE): Synthesized under ultra-high vacuum conditions by evaporating pure boron gas onto hot, highly clean metallic substrates (such as silver, gold, or copper).
- Substrate Interaction: The metallic substrate provides the necessary electrons to stabilize the planar 2D arrangement of boron atoms, forming a metallic sheet with mixed covalent and electron-deficient bonding networks.

Key Features of Borophene:

- Anisotropic Physical Properties: Exhibits direction-dependent mechanical, thermal, and electrical properties due to its asymmetric atomic lattice structures.
- Exceptional Mechanical Strength and Flexibility: Possesses an ultra-high tensile strength and high Young's modulus, while maintaining flexibility superior to graphene along specific crystallographic axes.
- High Thermal & Metallic Conductivity: Unlike bulk boron (a semiconductor), borophene acts as a fully metallic conductor with high thermal conductivity.
- Superior Tribological &Load-Bearing Capacity: Forms durable protective tribofilms during mechanical shear, significantly reducing surface roughness, friction, and mechanical wear.
- High Chemical Reactivity: Its electron-deficient nature makes it highly reactive, enabling uniform dispersion in organic fluids (like vegetable/castor oil) without requiring chemical surface modification.

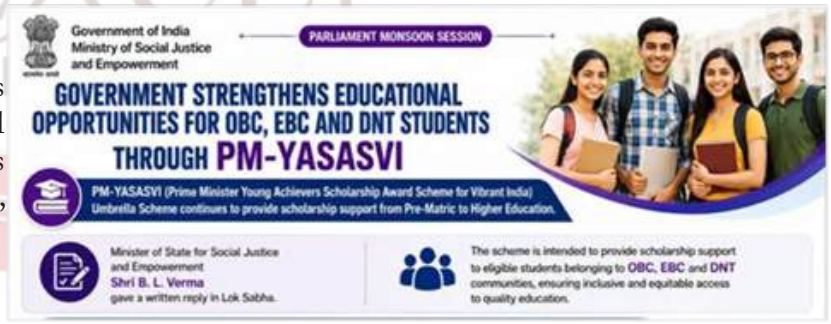
Key Applications:

- Used as an additive in bio-based lubricants to reduce friction, improve efficiency, and lower energy consumption in industrial machinery and marine transport.
- Its high capacity and fast ion transport make borophene ideal for next-generation batteries, supercapacitors, and hydrogen storage systems.

The PM-YASASVI (Prime Minister Young Achievers Scholarship Award Scheme for Vibrant India)

Context:

Minister of State reaffirmed the Government's commitment to expanding educational opportunities for disadvantaged students through the PM-YASASVI scheme, highlighting scholarships and hostel support.



PM-YASASVI

AboutThe PM-YASASVI (Prime Minister Young Achievers Scholarship Award Scheme for Vibrant India):

What It Is?

- PM-YASASVI (Prime Minister Young Achievers Scholarship Award Scheme for Vibrant India) is a comprehensive umbrella scheme implemented by the Department of Social Justice and Empowerment under the Ministry of Social Justice and Empowerment. It unifies scholarship support and residential hostel infrastructure for socially and educationally backward youth across India.

Launched In / Evolution:

- Origin: The hostel construction component originated in 1998–99 to address educational backwardness among OBC youth, undergoing a major revision in 2017–18.

- Umbrella Consolidation: Restructured and expanded into the present PM-YASASVI umbrella framework to cover financial assistance across all learning stages—from school level through top-tier college education.
- Aim: To eliminate financial constraints and geographical barriers for students hailing from rural and economically weaker sections, ensuring equitable access to secondary and higher education through financial scholarships and quality hostel facilities.

Target Beneficiaries & Eligibility Criteria:

- Identified Categories: Open to students belonging to Other Backward Classes (OBC), Economically Backward Classes (EBC), and Denotified, Nomadic, and Semi-Nomadic Tribes (DNT).
- Non-Creamy Layer Requirement: Applicants must be listed in Central/State/UT lists of OBCs and fall strictly outside the creamy layer.
- Priority Allocation: Hostels prioritize post-matric and undergraduate students coming from rural areas lacking local colleges, with a mandatory 5% seat reservation for students with disabilities.

Key Features of the Scheme:

Four-Tiered Scholarship Structure: Combines four major financial assistance channels:

- Pre-Matric Scholarship Scheme
- Post-Matric Scholarship Scheme
- Top Class Education in Schools Scheme
- Top Class Education in Colleges Scheme
- Differentiated Hostel Cost Norms: Standardizes per-seat hostel construction costs across geographic regions:
- North Eastern Region: 3.50 lakh per seat.
- Himalayan Regions: 3.25 lakh per seat.
- Rest of India: 3.00 lakh per seat.
- Strict Construction Timelines: Hostels must be completed within 18 months from the work order or two years from the first installment release, without project extensions.
- Streamlined Land Utilization: Removes the need to acquire new land by permitting hostel construction within ongoing State Government projects, engineering colleges, medical campuses, polytechnics, and Saansad Adarsh Gram Yojana (SAGY) villages.
- Performance-Linked Fund Release: Central grants are disbursed in a 3-stage 50:45:5 ratio, where the final 5% is withheld until physical occupation by OBC/EBC/DNT students is formally verified.
- Quality & Audit Reserve: Sets aside 0.25% of the budget allocation (up to 10 lakh) for independent third-party quality inspections and impact evaluations.

The Mission Aagaman: Vikram-1

Context:

Skyroot Aerospace successfully launched Vikram-1 under Mission Aagaman, making it India's first privately developed orbital-class rocket to place multiple payloads into Low Earth Orbit (LEO).



The Mission Aagaman: Vikram-1

About The Mission Aagaman: Vikram-1:

What is Mission Aagaman?

- Mission Aagaman is the maiden orbital launch mission of Vikram-1, India's first privately developed orbital launch vehicle.
- It represents the first attempt by an Indian private company to place multiple customer payloads into Low Earth Orbit (LEO).

Developed by: Skyroot Aerospace

- Authorised and facilitated by: IN-SPACe (Indian National Space Promotion and Authorisation Centre)

Aim:

- To validate India's first indigenous private orbital launch capability.
- To demonstrate the commercial viability of private launch services under the reforms introduced through the Indian Space Policy 2023.

Key Features:

- Launch Window: Between 12 July and 4 August 2026.
- Orbit: Payload deployment into 450 km Low Earth Orbit (LEO).
- Multiple Payload Mission: Carries satellites from Indian and international customers, including:
- SCOPE (Skyroot Aerospace)
- SOLARAS S3 (Grahaa Space)
- DCUBED technology demonstration payload
- Embrace robotic debris-capture payload (Cosmoserve Space)
- Symbolic Payloads: Includes Cosmic Bloom artwork and an 18-karat gold micro-rocket featuring microscopic sculptures of C. V. Raman, Vikram Sarabhai, and A. P. J. Abdul Kalam.

AboutVikram-1:

What is Vikram-1?

- Vikram-1 is India's first privately developed orbital launch vehicle (rocket), designed to place small satellites into Low Earth Orbit (LEO).
- It has been developed by Skyroot Aerospace as part of India's expanding commercial space programme.

Aim:

- To provide a reliable and cost-effective indigenous launch platform for small satellites.
- To strengthen India's private launch capabilities and expand commercial access to space.

Key Features:

- Payload Capacity: Can place 350 kg into Low Earth Orbit (LEO).
- Advanced Materials: Built using an all-carbon composite structure for reduced weight and improved performance.

Propulsion System:

- Reliable solid-fuel boosters
- 3D-printed liquid rocket engine
- Commercial Launch Vehicle: Designed for frequent and affordable launches of small satellites.
- Supports Diverse Missions: Suitable for communication, Earth observation, navigation, scientific research, and technology demonstration missions.

Significance:

- Marks India's first privately built orbital rocket, signalling the maturity of the country's private space industry.
- Demonstrates the success of Indian Space Policy 2023 and IN-SPACe-led reforms in opening the space sector to private participation.

India's First Approved Dengue Vaccine (Qdenga®)

Context:

The Central Drugs Standard Control Organisation (CDSCO) granted official marketing authorization for Qdenga®, approving India's first-ever dengue vaccine.



India's First Approved Dengue Vaccine (Qdenga®)

AboutIndia's First Approved Dengue Vaccine (Qdenga®):

What It Is?

- Qdenga® is a live, attenuated tetravalent dengue vaccine engineered using recombinant DNA technology. It uses a dengue virus type-2 backbone into which genes encoding surface proteins from the other three dengue serotypes are inserted. This structure provides balanced protection against all four dengue virus strains (DEN-1, DEN-2, DEN-3, and DEN-4).

Developed and Imported By:

- Manufacturer: Developed and manufactured by Takeda GmbH, Germany.
- Indian Importer: Imported and distributed locally by M/s Takeda Biopharmaceuticals India Pvt. Ltd.

Key Features of Qdenga®:

- Target Age Group: Indicated for the prevention of dengue disease in individuals between 4 and 60 years of age.
- Two-DoseImmunization Schedule: Administered as a 0.5ml subcutaneous injection in a two-dose regimen given three months apart (at month 0 and month 3).
- Global Regulatory Credentials: Possesses World Health Organization (WHO) prequalification and approval in over 42 countries, including the European Union, the UK, Indonesia, and Thailand, backed by over 24 million doses distributed globally.
- Proven Indian Phase III Validation: Regulatory approval followed a successful pivotal Phase III trial in India, confirming high immunogenicity and safety across diverse Indian populations.

Aboutthe CDSCO:

What It Is?

- The Central Drugs Standard Control Organisation (CDSCO) is the national regulatory authority of India for pharmaceuticals, medical devices, and cosmetics. It operates under the Directorate General of Health Services within the Ministry of Health and Family Welfare.
- Established In: Headquartered in New Delhi, the CDSCO derives its statutory authority from the Drugs and Cosmetics Act of 1940 and the Drugs Rules of 1945.

Key Functions:

- Approval ofNew Drugs and Vaccines: Scientific evaluation and market licensing of new drugs, biologicals, and vaccines before commercial release in India.
- Control Over Drug Imports: Grants licenses to import active pharmaceutical ingredients (APIs), finished formulations, and high-risk medical devices, ensuring compliance with Indian quality standards.
- Clinical Trial Governance: Regulates, approves, and monitors all phases of clinical trials conducted across India to protect participant safety.
- Standardization and Quality Surveillance: Coordinates with State Licensing Authorities (SLAs) to enforce uniform drug quality under the Drugs and Cosmetics Act, taking action against sub-standard or spurius medications.

The Mobile Phone Manufacturing Scheme (MPMS)

Context:

The Union Cabinet, chaired by Prime Minister Narendra Modi, officially approved the Mobile Phone Manufacturing Scheme (MPMS) with a massive budgetary outlay of 62,500 crore.



The Mobile Phone Manufacturing Scheme (MPMS)

AboutThe Mobile Phone Manufacturing Scheme (MPMS):

What It Is?

- The Mobile Phone Manufacturing Scheme (MPMS) is a newly launched macro-level manufacturing incentive policy designed to provide direct financial support for mobile phone production, localized

component sourcing, and design engineering. It serves as the new cornerstone framework for India's high-tech electronics infrastructure over the coming years.

- Aim: The core objectives of the MPMS are to scale up high-volume smartphone production, significantly deepen domestic value addition, and build supply chain resilience.

Key Features of the Scheme:

- Substantial Budgetary Outlay: Backed by a dedicated fiscal commitment of 62,500 crore.
- Five-Year Horizon: The tenure of the scheme spans a defined 5-year timeline, executing from FY 2026-27 to FY 2030-31.
- Differentiated Base Incentives: Provides direct financial incentive support on eligible product sales manufactured in India at differentiated rates ranging from 25% to 5%.
- Component Sourcing Linkage: Offers an additional financial incentive of up to 1.5% explicitly tied to the domestic sourcing of key components and sub-assemblies, encouraging localized ecosystem manufacturing.
- Dedicated Brand andR&D Incentive: To actively support the emergence of local brands, it awards an extra 3% incentive on eligible sales dedicated specifically to the product's design, engineering, and R&D phases.
- Massive Production Targets: Over its tenure, the program expects to drive cumulative domestic mobile phone production to approximately 39,00,000 crore.
- Job Creation Milestones: The deployment is projected to generate roughly 60,000 direct employment opportunities across manufacturing nodes.

Strategic Significance:

- The 3% design and R&D incentive encourages indigenous innovation, helping Indian firms develop patents and reduce dependence on foreign technologies.
- The MPMS builds on India's growing smartphone exports, supporting manufacturing expansion and deeper integration into global value chains after the PLI-LSEM scheme.

The White Rabbit Technology Demonstration Network

Context:

Union Minister inaugurated the White Rabbit Technology-based Indian Standard Time (IST) – Distribution Demonstration Network at the Regional Reference Standards Laboratory (RRSL) in Jakkur, Bengaluru.



The White Rabbit Technology Demonstration Network

AboutThe White Rabbit Technology Demonstration Network:

What It Is?

- The Jakkur demonstration network is India's first high-precision, Ethernet-based time distribution facility that uses advanced synchronisation protocols to transmit Indian Standard Time (IST) seamlessly over wide-area digital networks.
- Developed By: The project is led by the Legal Metrology Division under the Ministry of Consumer Affairs, in collaboration with NPL, ISRO, BSNL, and SEBI.

How It Works?

- Atomic Time Source: NPL and ISRO generate a sovereign Indian Standard Time (IST) reference, reducing dependence on foreign GPS systems.
- Precision Time Protocol (PTP): Time is transmitted through Ethernet/fibre-optic networks using the IEEE 1588 standard for highly accurate synchronization.
- Automatic Clock Calibration: Devices continuously correct clock drift using phase-locking, ensuring stable, sub-nanosecond synchronization.

Key Features of White Rabbit (WR) Technology:

- Ultra-High Precision: Delivers sub-nanosecond (<1 ns) synchronization across connected devices.

- Deterministic Communication: Ensures data reaches devices with predictable and fixed latency for synchronized operations.
- Highly Scalable: Supports thousands of devices across networks extending beyond 1,000 km.
- Open-Source Platform: Based on CERN's White Rabbit technology, enabling customized indigenous development.

Strategic Applications:

- Securing Critical Infrastructure: Protects defence, power, and nuclear networks from GPS spoofing and external timing attacks through an indigenous timing system.
- Strengthening Financial Systems: Enables accurate timestamping for stock exchanges and digital banking, reducing fraud and improving transaction reliability.
- Supporting Future Technologies: Provides precise timing for 5G/6G networks, quantum communication, and space operations, ensuring seamless high-speed connectivity.

The Investment Friendliness Index (IFI)

Context:

NITI Aayog launched the inaugural Investment Friendliness Index (IFI) to benchmark and promote state-level business reforms under the Viksit Bharat @2047 vision.



The Investment Friendliness Index (IFI)

About The Investment Friendliness Index (IFI):

What It Is?

- The Investment Friendliness Index is a comprehensive, structured, and evidence-based macroeconomic assessment framework. It evaluates how effectively India's subnational governments create, enable, and sustain an environment that attracts domestic and foreign private capital.
- Published By: The index is developed and published by NITI Aayog (the National Institution for Transforming India).
- Aim: The objective of the IFI is to strengthen the spirit of competitive and cooperative federalism across subnational governance.
- Criteria and Pillars Used for Evaluation:

Key Features of the Index:

- Four-Tier Performance Banding: States and UTs are grouped into four clear performance cohorts based on their cumulative scores:
- Top Performers (scores above 50)
- Frontrunners (45–50)
- Emerging Performers (≥40 – <45)
- Aspiring States (below 40)
- Equitable Peer-Group Comparisons: Recognizing geography and economic scale, the index splits regions into three distinct peer groups: Large States, Hilly & North-Eastern States, and Union Territories & City States.
- Investor Perception Integration: The index incorporates primary responses from 1,850 active investors.
- DetailedActionable State Profiles: Each state receives a dedicated diagnostic profile mapping indicator performance against regional peers.

Key Findings:

- Top Performers: Only five states scored above 50—Gujarat (56.6), Maharashtra (53.7), Tamil Nadu (53.3), Goa (53.1), and Odisha.
- Drivers of Success: Gujarat excelled in ports and infrastructure; Maharashtra in business climate and PE/VC investment; Tamil Nadu in exports and manufacturing.
- FDI Concentration: Maharashtra, Karnataka, Gujarat, Delhi, and Tamil Nadu account for 85% of India's FDI, while the Northeast receives less than 1%.

EXCEL CIVILS ACADEMY EMPOWERING FUTURE LEADERS

- Investment Trends: Total investment reached 29.9% of GDP (FY2025), led by government infrastructure and household real estate spending.
- Private Capex Gap: Private capital expenditure (8.7% of GDP) continued to lag behind public investment, highlighting the need to boost private sector participation.

The Index of Services Production (ISP)

Context:



The Government of India released the first sub-sectoral trial Index of Services Production (ISP) for April 2026, covering 19 sub-sectors representing nearly 60% of India's services sector.

The Index of Services Production (ISP)

About The Index of Services Production (ISP):

What It Is?

- The Index of Services Production (ISP) is India's first high-frequency macroeconomic indicator dedicated to measuring the performance of the services sector.
- It tracks short-term changes in the volume of output produced by the formal services sector relative to a specified base year.
- Published By: The ISP framework has been developed by the Ministry of Statistics and Programme Implementation (MoSPI).
- Aim: To provide a dedicated, high-frequency measure of services sector output, filling the statistical gap left by the Index of Industrial Production (IIP), which measures only industrial activity.

How Is the ISP Calculated?

- TheDeflator Requirement: Because primary service sector output data is collected in value terms, it naturally blends actual output with price fluctuations. The ISP requires price deflators to transform value-based (nominal) data into volume-based (real) data, isolating actual changes over time.
- Deflator Allocation Matrix: Currently, different price deflators are used based on the sub-sector:
- Wholesale Price Index (WPI): Applied specifically to deflate wholesale trade.
- Consumer Price Index (CPI): The relevant or closest matching CPI series is used for most other sectors.
- CPI–General: Applied to banking, insurance, and repair & maintenance.
- CPI–Services: Applied to sub-sectors where a specific individual CPI is unavailable.

The Underlying Data Ecosystem: The compilation draws from three main data pillars:

- Goods and Services Tax (GST) Data: Used for the first time in statistical applications, powering calculations for trade, accommodation, road transport, real estate, and professional services.
- Administrative/Secondary Data: Leveraged to capture the performance of air transport, railway transport, banking, and insurance.
- ASISSE Data: The Annual Survey of Incorporated Services Sector Enterprises will provide a database to eventually cover the non-government health and education sectors

Key Features of the Index of Services Production:

- Base Year: 2024–25:The ISP uses 2024–25 as its base year, aligning it with other statistical sub-sectors that use the new 2024-based Consumer Price Index series.
- High-Frequency Monthly Indicator:The ISP is designed as a monthly indicator to track short-term fluctuations in services output and provide more timely information on economic activity.
- Release Schedule:Regular monthly trial indices will be published with a lag of approximately 60 days, generally on the 29th of every month or the next working day if the 29th is a holiday.
- Initial Coverage of 19 Sub-Sectors:The first trial ISP for April 2026 covered 19 service sub-sectors, accounting for approximately 60% of India's services sector. Of these, 14 recorded double-digit year-on-year growth.

Major Growth-Performing Sub-Sectors:

The five strongest-performing sub-sectors in April 2026 were:

- Accommodation and food: 37.2%
- Retail trade: 30.8%
- Administrative and support services: 28.7%
- Real estate: 27.7%
- Telecommunications: 22.8%
- First-Ever StatisticalUse of GST Data: The ISP marks the first use of GST data for statistical applications. GST information will support measurement across wholesale and retail trade, accommodation and food, and arts and entertainment, among others.

Excluded Service Sub-Sectors:

The ISP currently excludes:

- Public administration and defence
- Financial services other than banking and insurance
- Central bank and money market fund activities
- Social work without accommodation
- Membership organisations
- Personal services
- Private households employing persons
- Extraterritorial organisations
- Government-provided health and education
- Gambling and betting activities
- These sectors are excluded because they are associated with core government activities, non-market services or significant informal-sector dominance.
- International Best-Practice Framework:The ISP methodology was developed with reference to international practices, particularly the OECD Compilation Manual for Index of Services Production (2007) and guidance from Eurostat.

Significance of the Index of Services Production:

- The Index of Industrial Production (IIP) measures only industrial activity and cannot capture short-term trends in services. The ISP provides a dedicated high-frequency measure for India's largest economic sector.
- Since services contributed nearly 9% of India's GVA in 2024–25, a dedicated high-frequency indicator can improve the accuracy and timeliness of national income and growth estimates.

National Innovation Challenge for Drone Application and Research (NIDAR 2.0)

Context:

The MeitY, in partnership with the Drone Federation of India (DFI), officially launched the second edition of the National Innovation Challenge for Drone Application and Research (NIDAR 2.0, 2026-27).



NIDAR 2.0

AboutNational Innovation Challenge for Drone Application and Research (NIDAR 2.0):

What It Is?

- NIDAR 2.0 is a premier national-level innovation hackathon designed to challenge engineering students to design, prototype, and build advanced autonomous drone software and hardware components. Moving away from basic pre-built airframes, this edition focuses on indigenous avionics, secure drone operating intelligence, and microchip integration.
- Part Of: NIDAR 2.0 operates as the flagship national innovation platform under MeitY's broader SwaYaan Capacity Building initiative.

- Aim: The objective of NIDAR 2.0 is to establish a self-reliant domestic drone industry by moving from simple drone assembly to manufacturing the drone's brain inside India.

Key Operational Features:

- Track 1: Drone Innovation (System Level): Tasks students with solving complex operational problems through autonomous systems:
- DisasterZone Swarms: Building fully autonomous swarm drones that can locate survivors and deliver medical supplies without relying on any external communication or cellular network.
- GPS-Denied Navigation: Developing drones that can navigate confined, dark indoor spaces without GPS for complex industrial inspections.
- Track 2: Component Innovation (Hardware Level): Challenges teams to build an indigenous flight controller and autopilot system using domestic electronic components. The hardware must be built around the open-standard VEGA microprocessor, designed by the Centre for Development of Advanced Computing (C-DAC).
- Hardware Bootstrapping Support: Following initial technical evaluations, the top 100 selected teams will each receive two free VEGA processor development kits from the government to test, program, and integrate into their prototypes.
- Expanded Incubation and Financial Rewards: Features an increased total prize pool of over 65 lakh.

Aboutthe SwaYaan Initiative:

What It Is?

- SwaYaan is a comprehensive, multi-year capacity-building program launched by the central government. It is designed to create a highly skilled workforce, support advanced research, and establish academic specializations in Unmanned Aircraft Systems (UAS) and allied drone technologies across India.
- Approval Date: Formally approved by MeitY in July 2022.
- Aim: The objective of SwaYaan is to train a large pool of engineers, technicians, and researchers to fulfill the workforce needs of the expanding Indian drone sector.

Key Institutional Features:

- The Hub-and-Spoke Model: Operates through a coordinated network of 30 premier academic and research institutions across India—including the Indian Institute of Science (IISc), various Indian Institutes of Technology (IITs), IIITs, NITs, C-DAC, and NIELIT nodes.
- Five Core Technical Themes: The initiative organizes its training curriculum and laboratory research under five essential work themes:
- Aeromechanics (Structural design, materials, and aerodynamics)
- Drone Electronics (Power boards, speed controllers, and sensor arrays)
- Guidance, Navigation, and Control (GNC) Algorithms and Simulation
- Drone Applications (Agriculture, mapping, and logistics software)
- Allied UAS Technologies (Counter-drone systems and communication encryption)
- Massive Training Milestones: The program has successfully trained more than 51,000 individuals across various skill levels.

Third India-Australia Annual Summit

Context:



Prime Minister of India visited Australia to participate in the Third India–Australia Annual Summit in Melbourne, where both leaders adopted a Joint Statement to deepen the Comprehensive Strategic Partnership (CSP).

Third India-Australia Annual Summit

AboutThird India-Australia Annual Summit:

What is it?

- The India–Australia Annual Summit is the highest-level bilateral engagement mechanism between the two countries, held annually to review and expand the Comprehensive Strategic Partnership (CSP) established in 2020.

Key Outcomes of the Third India–Australia Annual Summit:

1. Defense andMaritime Security Architecture:

- Joint Security Declaration: The leaders announced a milestone Joint Declaration on Defense and Security Cooperation alongside establishing an Annual Defense Ministers' Dialogue to elevate services-level interoperability.
- The Maritime Security Roadmap: Both nations launched the India-Australia Maritime Security Collaboration Roadmap and formalized a historic Memorandum of Understanding (MoU) between the Australian Maritime Border Command and the Indian Coast Guard.
- Defense Industrial Integration: Plans were formalized to finalize an MoU for the Provision of Defense Articles and Defense Services, supported by the upcoming placement of an Indian military instructor at the Australian Defense College in 2028-2029.

2. Trade, Critical Minerals, and Supply Chain Resilience

- Progressing toward the CECA: Building on the active Economic Cooperation and Trade Agreement (ECTA), both leaders committed to accelerating the finalization of a comprehensive, full-scale Comprehensive Economic Cooperation Agreement (CECA).
- Critical Minerals Partnership: The summit formalized project-based investment pipelines between government agencies and private firms to secure long-term offtake, refining, and value-addition capabilities for critical tech minerals.

3. Climate, Energy, and Space Technology

- Uranium Export Arrangements: The leaders finalized and signed the Administrative Arrangement under the bilateral Nuclear Cooperation Agreement, enabling immediate, long-term Australian uranium exports to India under strict IAEA safeguards.
- The Renewable Energy Partnership: Under the Joint Statement on Energy Security, the summit operationalized the Rooftop Solar Academy to drive decentralized electrification.
- Space Infrastructure Integration: Australia confirmed ongoing tracking support for India's Gaganyaan Human Space Flight Program by commissioning a temporary space tracking terminal on the Cocos Keeling Islands.

4. Education, Mobility, and Cultural Pacts

- Inaugurating Australian Campuses in India: The University Grants Commission (UGC) issued a Letter of Intent to Flinders University to open its campus in Bengaluru, and a Letter of Approval to Victoria University for a campus in Gurugram.
- The Maitri Grants Rollout: Australia announced a $10 million allocation for the Centre for Australia-India Relations' Maitri Grants to deepen people-to-people links.
- The Bhubaneswar Skilling Hub: The Western Australian Government partnered with India to establish a National Centre of Excellence for Skilling in Mining in Bhubaneswar, Odisha.

Strategic Opportunities:

- Unlocking Comprehensive Bilateral Trade: Finalizing the ambitious CECA will remove non-tariff trade barriers, helping businesses optimize operations across two massive consumer markets.
- Example: The ongoing drop in tariffs under ECTA has already boosted agricultural and textile shipments.
- SecuringClean Energy Feedstocks: India can secure its domestic semiconductor and EV push by importing certified lithium and cobalt from Australia.
- Example: Joint venture frameworks allow Indian entities to co-invest directly in mining assets across Western Australia.
- Deepening Space Exploration Backbones: Establishing multi-island technical telemetry links directly improves India's launch tracking capabilities.
- Example: The Cocos Keeling Islands tracking terminal provides critical real-time communication coordinates for the upcoming Gaganyaan mission.
- Bridging theVocational Skill Deficit: India can leverage Australia's industrial training modules to upgrade its local workforce in advanced engineering sectors.

- Example: The newly established Mining Centre in Bhubaneswar will deliver specialized vocational credentials to thousands of local technicians.
- Expanding Global Sports and Event Infrastructure: Preparing for sequential global tournaments provides an avenue to share best practices in modern sports logistics.
- Example: The countries launched a Sports Collaboration Roadmap as Australia prepares for the 2032 Brisbane Olympics and India builds assets for the 2030 Ahmedabad Commonwealth Games.

Key Challenges and Friction Points:

- The Weaponization of Economic Interdependence: Both economies face deep trade exposure to dominant regional non-market powers, creating high vulnerabilities during supply chain shocks.
- Example: Arbitrary export restrictions on critical lithium and rare earth elements highlight the difficulty of achieving commercial decoupling.
- Countering Regional and Cross-Border Terrorism: The emergence of new, online-driven radical networks and localized violent extremism presents an ongoing threat to democratic institutions.
- Example: The joint statement highlighted and condemned recent tragic terrorist acts perpetrated at Pahalgam and Bondi Beach.
- Disruptions to KeyMaritime Chokepoints: Ongoing geopolitical conflicts across West Asia directly threaten energy flows and maritime shipping safety.
- Example: Recent escalations in tensions near the Persian Gulf have driven up commercial logistics costs and insurance premiums for vessels.
- Slow Realization of Trade Treaties: Navigating domestic industrial lobbies, agricultural protections, and data localization rules can delay the final execution of full-scale trade deals.
- Example: Transitioning the early-stage ECTA into a finalized, comprehensive CECA has required years of complex regulatory negotiations.
- Persistent Gaps in Global Governance Reforms: Structural resistance from legacy superpowers continues to delay needed text-based updates to archaic international security councils.
- Example: Despite Australia's explicit backing for India's permanent seat, the UN Security Council remains unrepresentative of contemporary realities.

Way Forward:

- Executing the Uranium Administrative Arrangement: Fast-track the newly finalized regulatory protocols to commence continuous Australian uranium shipments for India's clean energy reactors under full IAEA safeguards.
- Finalizing the CECAFree Trade Agreement: Instruct trade ministries to resolve remaining tariff disputes to sign the Comprehensive Economic Cooperation Agreement before the end of the current fiscal year.
- Operationalizing PACTS for Supply Chains: Fully deploy the Australia-India Partnership on Cyber, Critical Technologies and Supply Chains to build secure, alternative semiconductor and telecom networks.
- Launching Trilateral Maritime Security Exercises: Leverage the existing Australia-India-Indonesia trilateral mechanism to execute real-time data sharing and counter marine pollution across the Eastern Indian Ocean.
- Standardizing the International Skilling Matrix: Ensure the vocational mining certifications delivered at the Bhubaneswar center are globally aligned, allowing smooth talent circulation between both industrial markets.

Conclusion:

By matching critical agreements like long-term uranium exports with advanced defense articles MoUs and direct university branch campuses, the two democracies have built a comprehensive, future-ready partnership. Moving forward, finalizing the comprehensive CECA trade deal and securing semiconductor supply lines will remain vital to protect their economic sovereignty and ensure regional stability.

TribeX Digital Learning Platform

Context:



Union Minister for Tribal Affairs officially launched TribeX, a first-of-its-kind digital learning platform dedicated to tribal arts, culture, traditional knowledge, and skill development.

TribeX Digital Learning Platform

AboutTribeX Digital Learning Platform:

What It Is?

- TribeX is a comprehensive, centralized digital learning ecosystem and repository created to preserve, document, and globally showcase India's rich tribal culture. The platform acts as an open-access gateway, offering learners, researchers, and enthusiasts worldwide the opportunity to study directly under master tribal artisans and native knowledge experts.
- Ministry: the Ministry of Tribal Affairs, Government of India.
- Aim: The core objective of TribeX is to bridge geographical barriers through technology, empower tribal communities, preserve indigenous knowledge, languages, and crafts, and promote sustainable livelihood-oriented education for future generations.

Key Features:

Dual-Tier Academic Framework:

- Free Certificate Courses: Currently hosts 20 free certificate courses covering a wide range of tribal art forms, paintings, handicrafts, handloom, and traditional musical instruments, with a formal roadmap to scale up to over 100 courses.
- Post Graduate Diplomas: Offers five UGC-recognized, one-year hybrid diploma programmes launched through a strategic MoU with the Sampurnanand Sanskrit University (SSU), Varanasi.

The Five Core PG Diploma Specializations:

- Tribal Language: Santali (utilizing the script Ol Chiki)
- Sustainable Tribal Culture-Based Livelihood Practices
- Museology and Tribal Museum Management
- Tribal Arts and Crafts of India
- Tribal Textiles
- Job-Oriented Curriculum: The PG diploma programs combine expert online lectures with mandatory real-world field internships and dissertation writing, explicitly designed to create immediate employment opportunities in design, curation, tourism, and research.
- Robust Core Management Systems: Driven by an integrated Learning Management System (LMS) and a secure Repository Management System, providing seamless user navigation, structured student tracking, and high-fidelity knowledge cataloging.
- Massive Multimedia Heritage Archive: Contains an expanding repository of over 5,000 multimedia resources (scaling up to 10,000), including field audio recordings, documentary videos, and verified literature capturing tribal festivals, socio-cultural rituals, and rare oral histories from across India.

The Performance Grading Index (PGI) 2.0

Context:



The Department of School Education & Literacy has officially released the detailed performance reports for the Performance Grading Index 2.0 for States/UTs (PGI-S) and the Performance Grading Index for Districts (PGI-D) for the 2025-26 academic year.

The Performance Grading Index (PGI) 2.0

AboutThe Performance Grading Index (PGI) 2.0:

What It Is?

- The Performance Grading Index (PGI) 2.0 is an advanced, data-driven analytical model designed to evaluate and score the performance of school education across sub-national administrative units in India.

- Moving away from standard, competitive league table numerical rankings, the system groups states, UTs, and districts into specific performance bands (grades) to encourage collaborative and targeted systemic upgrades.
- Established In: The index framework was originally introduced by the Ministry of Education in 2018 (covering data from 2017-18).

Types of PGI Instruments:

- PGI-S (States and Union Territories): Evaluates the high-level macro education environment and policy frameworks across all 36 States and UTs on a 1,000-point matrix.
- PGI-D (Districts): Pinpoints the implementation efficiency of localized district administrations across 784 districts on a tailored 600-point matrix.
- Aim: The objective of the PGI series is to provide a comprehensive, multidimensional picture of school education performance.

Key Features of the Dual Frameworks:

- The PGI-S Framework (1,000-Point Matrix):The state-level index tracks 70 indicators divided into two major categories: Outcomes and Governance & Management. These are further split into six operational domains:
- Learning Outcomes and Quality
- Access Outcomes
- Infrastructure & Facilities
- Educational Equity
- Governance Processes
- Teacher Education & Training
- The PGI-D Framework (600-Point Matrix): The district-level index evaluates 70 localized indicators split into six categories: Outcomes, Effective Classroom Transaction, Infrastructure Facilities & Student Entitlements, School Safety & Child Protection, Digital Learning, and Governance Process.
- Absolute Grading Band Hierarchy: Instead of assigning individual ranks, PGI 2.0 uses a strict multi-tier grading matrix based on percentage scores:
- Utkarsh: The highest achievable grade (for scores exceeding 90%).
- Uttam (Tiers 1–3): For scores ranging from 61% to 90%.
- Prachesta (Tiers 1–3): For scores ranging from 31% to 60%.
- Akanshi (Tiers 1–3): The base tier for scores under 40%.
- Cross-Platform Portal Integration: The framework is completely automated and eliminates self-reported errors by pulling verified data from major central education portals, including UDISE+, the PARAKH Rashtriya Sarvekshan 2024, the PM POSHAN Portal, and the PRABANDH database.

The UDISE Report 2025–26

Context:

The Union Ministry of Education officially released the comprehensive report on the Unified District Information System for Education Plus (UDISE+) for the academic year 2025-26.

The UDISE Report 2025–26

About The UDISE Report 2025–26:

What it is?

- The Unified District Information System for Education Plus (UDISE+) is one of the largest management information systems in the world, covering more than 14.8 lakh schools, 1.02 crore teachers, and over 26 crore students across India.
- Functioning as the primary, high-fidelity data repository for school education under the Department of School Education and Literacy, it serves as the foundational analytical engine for the government to track educational parameters, allocate fiscal resources, and fine-tune policies in alignment with the National Education Policy (NEP).

Key Indicators and Facts in the 2025-26 Report

1. Significant Drop in School Attrition:Dropout rates have declined across key stages, with preparatory-level dropouts falling to 8% and secondary-level dropouts reducing to 7.0%, indicating improved student retention.
2. Enhanced Student Retention & GER Surge: Retention has improved at both middle and secondary levels, while the Gross Enrolment Ratio (GER) at the secondary stage increased to 7%, reflecting wider access to schooling.
3. Strengthening Learner Transition Rates:Students are progressing more smoothly between school stages, with transition rates improving from foundational to preparatory, middle, and secondary education, reducing educational discontinuity.
4. Optimal Pupil-Teacher Ratios (PTR):Teacher strength has increased significantly, resulting in PTRs well below the NEP benchmark of 30:1, enabling better classroom attention and improved learning outcomes.
5. Consolidation of Unviable Institutions: The number of single-teacher and zero-enrolment schools has declined through rationalisation, improving resource utilisation and administrative efficiency across the school system.
6. Expansion ofDigital Infrastructure: More schools now have computers and internet connectivity, strengthening digital learning, online resources, and technology-enabled classroom education.
7. Core Sanitation and Gender Metrics: Nearly all schools now provide electricity, drinking water, and functional toilets, while women constitute a majority of teachers, supporting gender-inclusive education.

Technical Challenges:

- The Secondary-Stage Drop-Off Cliff:Despite high retention in early grades, secondary-level retention remains only 9%, showing that many students still leave school before completing higher education.
- The Persistent Playground Deficit:Although digital infrastructure has improved, the proportion of schools with functional playgrounds has declined slightly, affecting students' physical development and sports participation.
- Lagging Inclusivity for Children with Special Needs (CWSN): More than 40% of schools still lack adequate accessibility features, limiting equal educational opportunities for children with disabilities.
- Slow Adoption ofSustainable Infrastructure: Rainwater harvesting systems exist in only about 30% of schools, highlighting slow progress in promoting environmentally sustainable school infrastructure.
- Persistent One-Teacher Schools: Over 1 lakh schools still operate with only one teacher, placing excessive teaching and administrative responsibilities on a single individual and affecting learning quality.

Way Forward:

- Deploy Block-LevelSecondary School Networks: Expand secondary and senior secondary schools in underserved areas to improve accessibility and reduce dropouts after middle school.
- Launch a Dedicated CWSN Accessibility Campaign:Upgrade all remaining schools with ramps, accessible toilets, and barrier-free infrastructure to achieve fully inclusive education.
- Mandate Institutional Rainwater Harvesting:Install rainwater harvesting systems and rooftop solar panels in schools using government and CSR funding to promote sustainability.
- Mandate Multi-Teacher Staffing Minimums:Ensure every functioning school has at least two full-time teachers, improving teaching quality and reducing dependence on a single educator.
- Integrate Internet Connectivity withDigital Libraries: Link internet-enabled schools to platforms like the National Digital Library and PM e-VIDYA to maximize digital learning opportunities.

Conclusion:

The drop in retention at the secondary level and the persistence of single-teacher schools show that significant structural challenges still remain. Moving forward, combining basic infrastructural improvements with a strong focus on high-school accessibility, digital equity, and inclusive teaching will be essential to realize the full vision of the National Education Policy.

Report on Unlocking Growth in Tourism and Hospitality Sector

Context:

The Ministry of Tourism, in collaboration with NITI Aayog, officially released a milestone report titled "Unlocking Growth in Tourism and Hospitality Sector" at a National Workshop held in New Delhi.

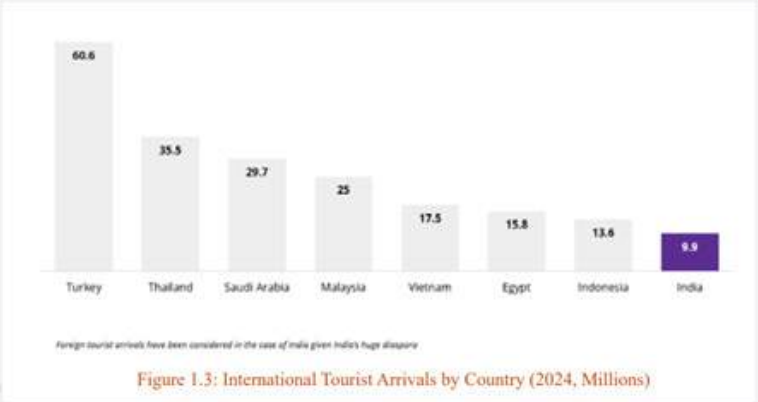


Figure 1.3: International Tourist Arrivals by Country (2024, Millions)

Report on Unlocking Growth in Tourism and Hospitality Sector

AboutReport on Unlocking Growth in Tourism and Hospitality Sector:

What It Is?

- The report assesses regulatory barriers affecting India's tourism sector. It recommends reforms in accommodation, hospitality, transport, and travel services to strengthen tourism and support the Viksit Bharat 2047 vision.

Key Data and Statistics on the Tourism &Hospitality Sector:

- Surging Domestic Demand:India recorded 2.9 billion domestic tourist visits in 2024, surpassing the pre-pandemic peak of 2.3 billion in 2019.
- Foreign Tourist Arrivals:India welcomed 9.95 million foreign tourists in 2024, earning nearly USD 35 billion in tourism receipts.
- Global Competitiveness Gap: India ranks 6th in Natural Resources and 9th in Cultural Resources in the TTDI, but only 39th overall.
- Long Project Delays:Hotel projects in India require nearly 60 approvals and take 36–48 months to complete.

Key Opportunities and Potential:

- High Employment Intensity:Tourism creates jobs across all skill levels, from hospitality workers to professional managers. This makes it one of India's most employment-intensive service sectors.
- Example: Hotels, tour operators, airlines, and travel companies generate both entry-level and specialized employment.
- Geographically Distributed Development: Tourism promotes balanced regional growth by attracting investment to rural, coastal, and heritage destinations. It helps diversify local economies beyond agriculture.
- Example: Kerala's backwaters and Rajasthan's heritage circuits generate income for local communities.
- Foreign Exchange Generation: Spending by foreign tourists brings valuable foreign exchange into India without exporting physical goods. This strengthens the country's external sector.
- Example: International tourists spend on hotels, transport, food, shopping, and cultural experiences within India.
- Shift Towards High-Value Tourism: India can increase earnings by promoting premium tourism instead of only increasing visitor numbers. Longer stays also raise tourist expenditure.
- Example: Wellness tourism, Ayurveda, luxury heritage hotels, and spiritual tourism attract high-spending visitors.
- Growth of Homestays: Homestays create affordable tourism infrastructure while providing direct income to rural households. They encourage community participation in tourism.
- Example: Registered homestays generated nearly 4,722 crore in revenue during 2024.

Key Challenges and Regulatory Bottlenecks:

- Restrictive Building Norms:Strict building regulations increase construction costs and reduce project viability. Developers often require taller and costlier structures to maximize space.
- Example: Rajasthan's 40% ground coverage limit increases hotel construction costs.
- Fragmented Licensing System: Hotels require multiple approvals from different authorities for the same establishment. This creates duplication and delays business operations.
- Example: Mumbai hotels need separate licenses for banquet halls, laundries, and salons.

- High Compliance Burden:Frequent renewal of operational licenses increases administrative costs and compliance burdens. Businesses spend significant time on paperwork.
- Example: Uttar Pradesh bar licenses require annual renewal every 31 March.
- Interstate Transport Barriers:Different state taxes and permit rules increase tourism transport costs and affect seamless interstate travel. This discourages integrated tourism
- Example: Kerala imposes separate taxes on tourist vehicles despite valid All India Tourist Permits (AITP).
- Complex Visa Procedures:Lengthy visa applications and technical issues discourage many foreign visitors. Simplifying visa processes can significantly improve tourist arrivals.
- Example: India's e-Visa system requires over 70 data fields and often faces foreign payment failures.

Key Recommendations ofNITI Aayog:

- Liberalize Building Regulations:Relax Floor Area Ratio (FAR) and ground coverage restrictions to reduce project costs. Faster approvals can attract greater private investment in tourism.
- Simplify Licensing:Merge multiple hotel licenses into a single approval system and remove duplicate permits. This will improve ease of doing business.
- Promote Homestays:Increase the permissible room limit for registered homestays and remove unnecessary NOCs. This will encourage rural entrepreneurship and community tourism.
- Reform Tourist Transport: Extend All India Tourist Permit (AITP) validity and remove overlapping state taxes. Uniform transport rules will improve interstate tourism connectivity.
- Introduce Visa-on-Arrival:Expand Visa-on-Arrival (VoA) and simplify the e-Visa process with easier payment systems. This can attract more international tourists and boost tourism receipts.

Conclusion:

The NITI Aayog roadmap seeks to unlock India's tourism potential by simplifying regulations, improving infrastructure, and promoting ease of doing business. These reforms can accelerate investment, enhance visitor experience, and make tourism a major driver of inclusive economic growth.

The General Dhiraj Seth Takes Over As The Chief Of The Army Staff

Context:



General Dhiraj Seth has formally assumed charge as the 31st Chief of the Army Staff (COAS) of the Indian Army, succeeding General Upendra Dwivedi, who retired after more than 40 years of distinguished service.

The General Dhiraj Seth

About The General Dhiraj Seth Takes Over As The Chief Of The Army Staff:

Who He Is?

- General Dhiraj Seth, PVSM, UYSM, AVSM, is a highly decorated four-star general officer of the Indian Army. Commissioned into the elite Armoured Corps (specifically the 2nd Lancers / Gardner's Horse) in December 1986, he brings nearly four decades of rich military experience to the top post and is the first officer from the Armoured Corps to lead the force since 1997.

His Professional Record and Achievements:

- Dual Army Command Experience: Commanded both the South Western Command and Southern Command, providing over 2.5 years of strategic leadership across key operational sectors.
- Elite Operational Leadership: Led the XXI Sudarshan Chakra Corps, served as GOC Delhi Area, and commanded a counter-insurgency force in Jammu & Kashmir.
- Force Modernisation: As the 49th Vice Chief of Army Staff, contributed to long-term military planning, capability development, and integration of emerging technologies.
- Academic & International Experience: Won the Silver Centurion award, attended premier military institutions, and served as a UN Operations Officer during UNAVEM III (1995–96) in Angola.

About the Chief of the Army Staff (COAS):

What It Is?

- The Chief of the Army Staff is the professional head and operational leader of the 3-million-strong Indian Army. Holding the rank of a four-star General, the COAS is the principal military advisor on land warfare to the Ministry of Defence and is a permanent member of the Chiefs of Staff Committee.

History of the Office:

- The Colonial Origin: The position traces its roots back to the Commander-in-Chief, India, who oversaw all military assets under British East India Company and Crown rule.
- Post-Independence Shift: In 1947, the post was designated as the Commander-in-Chief, Indian Army.
- The Modern Title: In 1955, the Parliament enacted the Commander-in-Chief (Change in Designation) Act, officially renaming the professional head as the Chief of the Army Staff (COAS), with General Maharaj Shri Rajendrasinhji Jadeja serving as the first to bear the modern title.

Key Functions of the COAS:

- Operational Control andStrategic Readiness: Holds overall structural control of the Army, maintaining maximum combat readiness, border vigilance, and defense capabilities along all territorial frontiers.
- Force Restructuring and Tech Modernization: Drives long-term force transformation by prioritizing new capability development, procurement roadmaps, and integrating automated or modern weapon systems into active combat cycles.
- Inter-Service Synergy: Works in close coordination with the Chief of Defence Staff (CDS), the Chief of the Naval Staff, and the Chief of the Air Staff to design joint-warfare frameworks and integrated theater commands.
- National Crisis Management: Leads the military's rapid response networks during national emergencies, cross-border counter-insurgency tasks, and Humanitarian Assistance and Disaster Relief (HADR) missions.

The e-OCI Card

Context:

Union Home Minister and Minister of Cooperation launched the FCRA 2.0 Portal and the highly anticipated e-OCI (Electronic Overseas Citizen of India) Card in New Delhi.



The e-OCI Card

AboutThe e-OCI Card:

What It Is?

- The Electronic Overseas Citizen of India (e-OCI) Card is a citizen-centric, paperless documentation framework designed for the global Indian diaspora. It converts the traditional, physical OCI stamp-and-booklet layout into an institutionalized, securely verifiable digital credential.
- Ministry: Ministry of Home Affairs (MHA), Government of India.

Aim:

- To eliminate physical paperwork, verification delays, and administrative overhead costs for more than 50 lakh OCI holders.
- To integrate diaspora credentials directly with real-time digital immigration security lines across all Indian airports.

Key Features of the e-OCI System:

- Elimination of the Age-20 Booklet Re-issue: Scraps the complex rule that forced cardholders to get a fresh physical OCI booklet re-issued whenever they received a new passport after turning 20 years old.
- SeamlessOnline Passport Updates: Cardholders simply log in to update their new passport numbers and details online without needing physical submissions or in-person verification.

- Lifelong Unique Registration: Assigns an unchangeable, unique digital registration number to each cardholder to ensure secure, lifelong tracking.
- End-to-End Digital Workflow: Applicants can submit applications, upload supporting documents, clear security profiles, and download their approved digital e-OCI cards directly via ociservices.gov.in.
- Advanced OCR Analysis: Uses Optical Character Recognition (OCR) technology to automatically verify uploaded foreign passports, reducing data errors and processing times.
- Virtual Mobile Portability: Cardholders can safely store and display their digital credentials on mobile devices, removing the risk of losing or damaging physical booklets during international travel.

Key Benefits Preserved Under the Scheme:

- Registered e-OCI cardholders continue to enjoy robust statutory rights under Section 7A of the Citizenship Act, 1955:
- Lifelong Visa Status: Grants a multiple-entry, multi-purpose lifelong visa to visit India for any general purpose.
- FRRO Exemptions: Complete exemption from reporting or registering with local police authorities or Foreigners Regional Registration Officers (FRRO), regardless of the length of stay in India.
- Economic Parity: Grants equal status with Non-Resident Indians (NRIs) across economic, educational, and financial sectors—excluding the right to buy agricultural or plantation properties.
- Frictionless Employment: Permits cardholders to take up employment in India without needing to apply for a separate commercial employment visa.

EXCEL CIVILS ACADEMY EMPOWERING FUTURE LEADERS

Chapter-
8

INTERNATIONAL RELATION

Do Not Surrender to China, Do Not Depend on the U.S

Context:



Renewed debates over India's China policy have emerged amid the Trump administration's shifting trade and strategic approach, prompting calls from sections of industry to normalize economic ties with China.

Do Not Surrender to China, Do Not Depend on the U.S

AboutDo Not Surrender to China, Do Not Depend on the U.S:

What it is?

- The strategic dilemma highlights New Delhi's complex foreign policy choice between two global powers: an erratic United States and an actively hostile China. India faces pressure from domestic business lobbies urging an economic reset with Beijing due to supply chain reliance, while simultaneously navigating transactional US policies under the Trump administration—including tariffs and stricter H-1B visa

Background:

- U.S. Policy Shifts & Friction: The Trump administration imposed punitive tariffs on Indian steel and aluminum, stripped India's preferential trade status, tightened H-1B visa rules, and renewed diplomatic ties with Pakistan.
- Decade of Chinese Aggression: China has consistently challenged Indian sovereignty through border incursions across the Line of Actual Control (LAC)—notably in Depsang (2013), Chumar (2014), Doklam (2017), and Galwan (2020).
- Economic Coercion & Dependence: India remains heavily reliant on Chinese active pharmaceutical ingredients (APIs), machinery, industrial inputs, and rare earths, leading to an annual trade deficit exceeding $100 billion.
- Sino-Pak Security Nexus: During Operation Sindoor (May 2025), Beijing provided real-time tactical satellite data and intelligence to Islamabad, reinforcing its active support for Pakistan's security framework against India.

Critique of the Corporate Push for a China Reset:

- Focus on Short-Term Gains: Corporate lobbies prioritize immediate balance-sheet profits—seeking cheap capital, machinery, and active pharmaceutical ingredients—over long-term national security.
- Disregarding Border Realities: Proponents of a reset ignore a dozen years of deliberate Chinese Communist Party (CCP) aggression, treating international trade as an apolitical transaction.
- Example: Overlooking PLA salami-slicing tactics across the LAC and the renaming of features in Arunachal Pradesh.
- Ignoring Economic Coercion: A hasty reset overlooks China's history of abruptly cutting off critical components during diplomatic disputes.
- Example: Beijing's weaponization of its monopoly over rare earths and tunnel-boring machines.
- DisregardingAnti-India Diplomatic Acts: Corporate advocates ignore Beijing's active collusion against Indian interests in multilateral forums.
- Example: China's use of its UNSC veto to block sanctions on Pakistan-based terrorist networks and stall India's entry into the NSG.

The Pitfalls of Unilateral Economic Relaxation:

- Subsidizing Encirclement: Opening Indian markets to Chinese capital without resolving border disputes expands China's trade surplus and funds its strategic posture against India.
- Providing an Economic Kill-Switch: Re-establishing deep industrial dependencies gives Beijing leverage to paralyze Indian manufacturing during future military or political crises.
- Surrendering Diplomatic Leverage: Dismantling post-Galwan restrictions on Chinese apps, telecom infrastructure, and FDI without receiving territorial concessions amounts to unilateral diplomatic disarmament.
- Encouraging Chinese Dominance: Relaxing economic defenses signals vulnerability to Beijing, allowing it to dictate terms on border settlements from a position of economic strength.

The Illusion of Relying on the United States:

- Unpredictable Policy Shifts: Washington's foreign policy remains transactional, with strategic priorities shifting rapidly based on domestic political calculations.
- Example: The imposition of steel/aluminum tariffs and tighter H-1B visa quotas under the Trump administration despite diplomatic outreach.
- Risk of Bilateral Deals: Washington's history of sudden tactical shifts creates the risk that it could negotiate separate agreements with adversary states, leaving partners exposed.
- Example: The rapid renewal of high-level engagements with Islamabad despite India's regional security concerns.
- Absence of Ultimate Security Guarantees: Despite diplomatic engagement through officials like envoy Sergio Gor, the U.S. will not act as a primary security guarantor on India's land borders.
- Example: India stands alone in managing border standoffs along the high-altitude terrain of Eastern Ladakh.
- Pragmatic Self-Reliance: Acknowledging Washington's unreliability does not require drifting into an economic embrace with Beijing; India must maintain a balanced, self-reliant position between both powers.

Way Forward for India:

- Exercise Strategic Patience: Maintain a firm, non-compromising posture along the LAC and in economic regulations until China demonstrates genuine, verifiable diplomatic reciprocity.
- Fortify Domestic Manufacturing: Accelerate supply chain resilience and build domestic industrial capabilities for critical inputs, APIs, and high-tech components, accepting short-term inflationary costs for long-term security.
- Diversify Global Trade Networks: Deepen economic, technological, and defense ties with alternative reliable partners across Europe, East Asia, and the Global South.
- Preserve Strategic Autonomy: Resist the pressure to align completely with any power block, ensuring that India maintains the sovereign capacity to walk straight on its own terms.

Conclusion:

India's path to global leadership requires resisting short-term corporate pressures and navigating superpower rivalry without sacrificing its core territorial and economic sovereignty. By fortifying domestic manufacturing and maintaining firm leverage, New Delhi can safeguard its strategic dignity and secure its position in an evolving multipolar order.

Canada-India Defence Collaboration

Context:

Canadian High Commissioner to India Chris Cooter outlined a strategic framework to expand defence and high-technology partnerships between Ottawa and New Delhi.



Canada-India Defence Collaboration

AboutCanada-India Defence Collaboration:

What it is?

- Canada-India defence collaboration is an emerging strategic alignment between two major democracies to diversify supply chains, co-develop advanced military platforms, and secure critical natural resources.

- Driven by changing global geopolitics and vulnerabilities exposed by West Asian conflicts, the framework focuses on combining Canada's high-tech R&D, space robotics, and mineral reserves with India's massive industrial base, manufacturing scale, and expanding defense market.

Key Data and Statistics on India and Canada:

- Defense Outlay Expansion: Canada has surpassed 2% of its GDP on defence spending in 2026 and is on track to hit 5% by 2035.
- Global Critical Minerals Reserve: Canada possesses vast geological reserves of 31 critical minerals, including 5% of the world's tungsten reserves and the 10th largest reserves of rare earth elements.
- Aerospace R&D Allocation: Ottawa launched a $500 million investment in next-generation aerospace technologies, including a dedicated drone innovation hub.
- Top-Tier Recoverable Uranium: Canada holds the 3rd largest recoverable resources of uranium worldwide, serving as a primary clean energy and nuclear partner.

Opportunities for India-Canada Defence Collaboration:

- Co-Development and Subsystem Manufacturing: Canada's new Defence Investment Agency encourages co-development with natural partners, allowing Indian defense firms to manufacture sub-assemblies for global supply chains.
- AerospaceTechnology Integration: Combining Canada's full-spectrum aerospace sector with India's rapidly expanding domestic manufacturing hub accelerates joint production of autonomous systems and drone technologies.
- Civilian Space and Maritime Surveillance: Integrating Canada's RADARSAT constellation system and space robotics with India's low-cost launch platforms expands naval domain awareness across the Indian Ocean.
- Securing Critical Mineral Supply Chains: The bilateral MoU on Critical Minerals Value Chains guarantees stable access to cobalt, helium, and rare earth elements necessary for India's high-tech defense industries.
- Naval Interoperability inthe Indo-Pacific: Joint participation in major international naval exercises like RIMPAC and Talisman Sabre enhances tactical coordination between the two navies.

Initiatives Taken So Far:

- Reciprocal Military Accreditation: Accredited dedicated Defence Advisers in both Ottawa and New Delhi to streamline military-to-military communication.
- Institutionalizing the Bilateral Defence Dialogue: Established a high-level Defence Dialogue between top leadership to prioritize common security goals and align industrial capacity.
- Military Exchange Programs: Hosted a delegation from India's National Defence College in Canada to facilitate direct exchanges between military colleges and training bases.
- Critical Minerals MoU Signing: Signed a Memorandum of Understanding on Critical Minerals Cooperation during the March 2026 bilateral summit to build resilient, non-monopolized supply lines.

Key Challenges Associated with the Partnership:

- Legacy Political and Diaspora Friction: Past diplomatic strain surrounding diaspora politics and national sovereignty concerns requires careful handling to build lasting trust.
- Slow Institutional Mechanism Development: Bilateral institutions and joint working groups are still developing, requiring sustained diplomatic push to move beyond initial MoUs.
- Navigating ComplexMilitary Procurement Protocols: Aligning different defence procurement systems, export control rules, and regulatory frameworks can cause project delays.
- High Exposure to Global Supply Chain Shocks: Geopolitical conflicts in West Asia and maritime chokepoint disruptions create continuous pricing volatility for international material shipments.
- Evolving Technology Transfer Barriers: Strict intellectual property rules and international technology sharing agreements can complicate full-spectrum transfer of advanced algorithms and satellite components.

Way Forward:

- Operationalizing JointDefense Research Projects: Direct the Canadian Drone Innovation Hub and Indian defense startups to launch co-funded, pre-competitive projects in autonomous aerial systems.

- Formalizing Bilateral Logistics Support Pacts: Finalize a Mutual Logistics Support Agreement to allow seamless port calls, refueling, and repairs for both navies during Indo-Pacific deployments.
- Establishing In-CountryQuality Testing Facilities: Set up joint certification centers for critical minerals to ensure refined inputs meet defense manufacturing standards before trade export.
- Expanding Officer Exchanges and Joint Wargaming: Increase the frequency of officer placements at staff colleges and expand participation in complex multi-domain wargames.
- Fast-Tracking the Comprehensive Economic Partnership (CEPA): Conclude ongoing trade negotiations to provide clear legal protections for cross-border investments in aerospace, defense, and space technologies.

Conclusion:

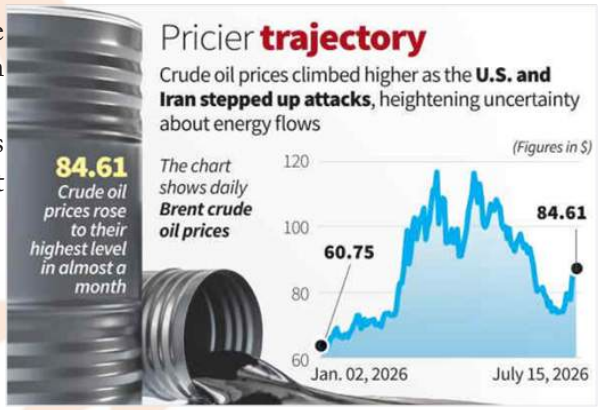
The changing global security landscape offers a clear opportunity for Canada and India to build a strong, future-focused defense partnership. By matching Canada's advanced technology and critical mineral reserves with India's manufacturing capacity, both nations can build resilient, independent supply chains. Ultimately, overcoming past diplomatic friction and executing co-development projects will remain vital to ensure shared regional stability in the Indo-Pacific.

Iran's Disruptive Strategy, Its Global Consequences

Context:

A month after signing a temporary peace memorandum, the United States and Iran resumed hostilities in West Asia with retaliatory strikes.

- The conflict escalated after Iran's Revolutionary Guards threatened to halt regional energy exports, declaring that oil and gas would flow "for everyone or for no one."



Iran's Disruptive Strategy, Its Global Consequences

AboutIran's Disruptive Strategy, Its Global Consequences:

What it is?

- Iran's disruptive strategy represents a calculated geopolitical doctrine of coercive brinkmanship designed to challenge Western influence and dominate regional dynamics.
- Instead of relying on traditional diplomatic channels or global consensus, Tehran utilizes an overlay of state-backed military power, geographic control over the Strait of Hormuz chokepoint, and an asymmetric network of proxies known as the "Axis of Resistance."

Background of the U.S.–Iran Conflict:

- The Proxy Networks: Beginning in the late 1990s, Iran systematically engineered a disruptive proxy strategy by building and arming the "Axis of Resistance"—comprising Hamas, Hezbollah, and the Houthis—to establish tactical leverage across West Asia.
- The February 28 Attack and Blockade: The long-standing friction erupted into a large-scale war on February 28, 2026, when the U.S. and Israel launched a massive bombing campaign, prompting Iran to retaliate by blockading the Strait of Hormuz.
- The Failure of the Islamabad Memorandum: In June 2026, both sides briefly halted hostilities to sign an interim peace agreement called the Islamabad Memorandum of Understanding; however, the deal completely broke down within a month following a renewed U.S. maritime blockade on Iranian ports.
- The Shift to Hardline Clerical Consolidation: The regime's hardline approach has intensified inside Iran following the high-profile funeral of its slain supreme leader, Ali Khamenei, which left the state apparatus under the firm control of the Islamic Revolutionary Guard Corps (IRGC) and ultra-conservative clerics.

Recent Tensions:

- A New Wave of Air Strikes: The U.S. Central Command launched heavy air raids near the critical port cities of Bandar Abbas, Qeshm, Bandar Imam Khomeini, and Bushehr to degrade Iran's ability to attack commercial shipping.
- DirectRegional Interceptions: Iran's Revolutionary Guards launched direct missile and drone barrages

targeting the U.S. Fifth Fleet in Bahrain, while Jordan's armed forces actively intercepted and downed three inbound missiles from Tehran.

- Targeting Neutral Maritime Vessels: Coercive actions spread directly into international waters, marked by an explosion disabling a Norwegian tanker off the Omani coast and an Iranian missile strike wounding four crew members on a Kuwaiti naval vessel.

Consequences of the Iranian Disruption Strategy:

1. Global Impacts:

- Rapid Spikes in Global Energy Prices: The return to war instantly disrupted international oil markets, driving the spot price of Brent crude higher by 15% to near $85 a barrel.
- Erosion of Spare Supply Buffers: The renewed blockage of the Strait of Hormuz has forced the drawdown of global oil reserves, leaving the International Monetary Fund (IMF) to warn that the world has used up its capacity to buffer future shocks.
- The Strait of Hormuz Chokepoint Crisis: A prolonged closure of the strait effectively bottles up one-third of global helium production and a massive share of world oil and liquefied natural gas (LNG), threatening global industrial networks.
- Weaponization of Transit Tariffs: Iran has introduced a disruptive plan to levy "special transit rates" on select friendly nations using the strait, deliberately splitting collective international action against its blockade.

2. Impacts on India:

- Severe Vulnerability to LPG Cutoffs: Because approximately 90% of India's LPG imports transit directly through the Strait of Hormuz, the sudden closure creates an immediate risk to India's domestic cooking fuel security.
- Disruption of Strategic Trade Corridors: The maritime warfare directly threatens India's heavy capital investments in regional connectivity nodes, particularly the Chabahar Port and the International North-South Transport Corridor (INSTC).
- Forced Shifts in Crude Oil Sourcing: Heightened regional risk has accelerated India's costly macro shift away from West Asian energy inputs to search for more expensive, alternate suppliers in a tightening market.
- Diplomatic Realignment and Condemnation: Moving away from its traditional quiet stance, India co-sponsored and voted for UN Security Council Resolution 2817, formally condemning Iran's attacks on Jordan and the GCC nations.

Way Forward:

- Building Global Non-Western Collective Pressure: Elicit diplomatic pressure from large, emerging Asian middle powers—rather than just Western economies—to pressure Iran into stopping its maritime blockades.
- Utilizing De-Frozen Assets as Peace Leverage: Establish diplomatic entry points that link the gradual un-freezing of Iran's foreign financial assets to verifiable halts in proxy rocket and drone attacks.
- Transitioning to Alternative Regional Shipping Channels: Coordinate with regional partners like Oman and Saudi Arabia to map out alternative land-based transit and pipeline bypass routes that avoid the Strait of Hormuz.
- DiversifyingDomestic Strategic Fuel Inventories: Accelerate national initiatives to expand domestic energy buffers, scale up strategic petroleum reserves, and increase compressed biogas blending to insulate the economy from West Asian supply cuts.

Conclusion:

Iran's reliance on coercive brinkmanship and maritime disruptions may offer short-term tactical advantages, but it ultimately acts as a long-term blunder that isolates the country from global trade. The breakdown of the Islamabad MoU and the immediate spike in Brent crude prices to $85 demonstrate that regional conflicts rapidly destabilize global energy security. Moving forward, India must look past traditional ties to protect its trade routes, support multilateral UN mandates, and rapidly expand its own domestic energy alternatives.

The India–UK Comprehensive Economic and Trade Agreement (CETA)

Context:

The landmark India–UK Comprehensive Economic and Trade Agreement (CETA) officially came into effect on July 15, 2026.



The India–UK Comprehensive Economic and Trade Agreement (CETA)

AboutThe India–UK Comprehensive Economic and Trade Agreement (CETA):

What it is?

- The India–UK Comprehensive Economic and Trade Agreement (CETA) is a modern, deep-integration bilateral trade pact designed to liberalize commerce in both merchandise and services. By removing traditional border barriers and aligning professional standards, the CETA looks to double overall bilateral trade value from its current base of approximately $56 billion by the end of the decade.

Key Summary of the Agreement:

- ComprehensiveDuty-Free Access: The UK has granted zero-duty market access on nearly 99% of India's export lines, covering nearly 100% of India's current merchandise trade value.
- Removal of the Regional Tariff Handicap: The pact eliminates the strict tariff disadvantage (ranging from 4% to 16%) that Indian exporters previously faced in the British market compared to zero-duty regional competitors like Bangladesh, Pakistan, and Cambodia.
- Calibrated AutomobileImport Deregulation: India will reduce its high import tariffs on British passenger vehicles (previously around 110%) down to 10% over a decade. This is controlled through an annual quota limit of 37,000 completely built units (CBUs), while completely protecting domestic small ICE cars and early-stage affordable EVs.
- Scotch Whisky Tariff Phase-Down: Customs duties levied on British Scotch whisky imports will be systematically reduced from 150% down toward a 40% threshold over a ten-year transition window.
- The Double Contribution Convention (DCC): The agreement introduces a crucial DCC framework that exempts short-term Indian professionals sent to the UK from contributing to the British National Insurance grid for up to 60 months, returning hard-earned cash back to transient workers.
- Unprecedented Services Expansion: India has secured wide-ranging market access commitments across 12 major services sectors and 137 sub-sectors from the UK, representing over 99% of India's export interests.
- Professional Mobility and Entitlements: Both nations committed to concluding Mutual Recognition Agreements (MRAs) for professional qualifications—specifically targeting nursing, accountancy, and architecture—within 12 months.
- Ambitious Steel Quota Restructuring: To insulate Indian exporters from newly imposed British steel regulations, the UK expanded India's country-specific steel quota three-fold (from 12,405 tonnes to 33,456 tonnes) while reserving 40% exclusively under the Authorised Use Scheme.

Opportunities for India:

- Spurring Formal Labor-Intensive Jobs: Zero-duty access directly drives production and employment across crucial domestic clusters like the garment units of Tiruppur and the footwear hubs of Agra.
- Scaling Up GlobalPharmaceutical Generic Shipments: Removing duties allows India's low-cost generic medicine sector to bid competitively on equal terms within the UK's massive $30 billion annual pharmaceutical market.
- Substantial Corporate and Talent Cost Savings: The elimination of dual social security payments under the DCC is projected to save over 75,000 Indian professionals and 900 companies roughly $600 million annually.
- Unlocking High-Value Procurement Contracts: Indian service suppliers gain direct, legally protected access to bid fairly on the UK's massive £90 billion ($122 billion) government procurement market.

- TransformingGlobal Capability Centres (GCCs): Enhanced digital service regulations encourage British firms to transition their Indian operations from low-cost back offices into high-value hubs for R&D, analytics, and cybersecurity.

Opportunities for the United Kingdom:

- Expanding Luxury Automotive Footprint: Calibrated quota access allows premier, large-engine British automotive brands (above 3000cc petrol/2500cc diesel) to scale up exports into one of the world's fastest-growing premium consumer markets.
- Dramatically Increasing Premium Spirits Volume: Lowering the steep 150% Scotch whisky tariff helps UK distilleries rapidly expand distribution and market share among India's expanding middle class.
- Reciprocal Access to India's Procurement System: British industrial entities gain a transparent, non-discriminatory pathway to compete within India's growing $114 billion public procurement projects.
- Direct Digital andFinancial Services Integration: The framework provides UK fintech ecosystems, electronic payment firms, and educational organizations clear legal pathways to partner with or establish operational campuses inside India.

Key Challenges Associated with CETA:

- Historically Low FTA Utilization Efficiency: Indian small industries and MSMEs frequently fail to exploit signed trade pacts due to complex procedural documentation, clean rules-of-origin compliance checks, and a general lack of institutional awareness.
- Navigating Intense Non-Tariff Barriers: Even with zero tariffs, Indian agricultural, marine, and food-processing exports face strict UK and European sanitary and phytosanitary (SPS) compliance standards, which can lead to swift border rejections.
- ManagingStructural Economic Disruptions: Selectively lowering tariff walls exposes domestic producers to highly optimized international products, which can squeeze the profit margins of legacy, protected local players.
- The Vulnerability of Supply Chain Chokepoints: Ongoing maritime conflicts across the Strait of Hormuz and the Red Sea drastically drive up shipping costs and lengthen voyages, threatening to cancel out the pricing edge gained from tariff cuts.

Way Forward:

- Deploying Mass MSME Information Campaigns: Ministeries and premier trade bodies must launch direct outreach programs to educate small scale enterprise groups on how to effectively navigate CETA's digital certification rules.
- Accelerating Professional Qualification MRAs: Meet the strict 12-month deadline to finalize Mutual Recognition Agreements, ensuring fast track mobility for Indian nurses, architects, and accountants.
- Upgrading DomesticQuality Standards Control: Establish advanced test labs adjacent to textile and agri-export hubs to verify that shipments flawlessly conform to the UK's technical and environmental regulations before leaving port.
- Optimizing the Expanded Steel Quota Access: Instruct domestic steel manufacturers to fully utilize the specialized country-specific quotas and the exclusive Authorised Use Scheme allocation to capture market share.

Conclusion:

The implementation of the India–UK CETA marks a defining, historic test of India's competitive confidence in the global trade arena. By matching zero-duty access for labor-intensive exports with a phased, development-oriented opening for premium British imports, the agreement serves as a blueprint for balanced economic integration. Ultimately, the promised trade doubling will depend on how aggressively and confidently Indian enterprises step through this open door to compete on the global stage.

The World Artificial Intelligence Cooperation Organisation (WAICO)

Context:



China has launched the World Artificial Intelligence Cooperation Organisation (WAICO) in Shanghai, positioning it as a global AI governance platform for the Global South and developing countries.

The World Artificial Intelligence Cooperation Organisation

About The World Artificial Intelligence Cooperation Organisation (WAICO):

What It Is?

- WAICO is a China-led international AI governance platform aimed at promoting AI cooperation, capacity building, and common governance standards among developing countries.
- Headquarters: Shanghai, China.
- Aim: To promote inclusive AI development, strengthen international cooperation, build AI capacity in developing countries, and establish a collaborative AI governance framework led by the Global South.

Key Features:

- Global South Focus: Established with 30 participating countries, mainly from Asia, Africa, and Latin America, to strengthen AI cooperation.
- Capacity Building: China will provide 5,000 AI training opportunities and establish joint AI cooperation centres with ASEAN, African Union, BRICS, SCO, League of Arab States, and CELAC.
- Open-Source AI Promotion: Encourages open-source AI models, technology sharing, and collaborative AI development.
- Alternative AI Governance Model: Promotes an AI governance framework emphasizing digital sovereignty, multilateralism, and opposition to technology restrictions.
- Strategic AI Ecosystem: Supports the adoption of Chinese AI models as alternatives to Western platforms such as ChatGPT and Claude.

Significance:

- Strengthens China's influence in global AI governance and deepens technological partnerships with the Global South.
- Offers an alternative AI ecosystem based on open-source collaboration and digital sovereignty

The Codex Alimentarius Commission

Context:

India secured major advancements at the 49th Session of the Codex Alimentarius Commission (CAC49) held in Geneva, Switzerland, where the commission officially adopted seven food standards and guidelines developed under Indian leadership.

The Codex Alimentarius Commission

About The Codex Alimentarius Commission:

What It Is?

- The Codex Alimentarius (Latin for Food Code) is a comprehensive collection of internationally recognized and adopted food standards, guidelines, codes of practice, and related recommendations. Rather than operating as an independent, legally binding regulation, it serves as a scientifically backed international reference guide to help countries harmonize their sovereign food laws.
- Established In: The Codex Alimentarius Commission (CAC) was established in early November 1961 by the Food and Agriculture Organization (FAO), with the World Health Organization (WHO) joining in June 1962.

Primary Aim:

The foundational goals of the Codex system are threefold:

- Protecting the health of consumers worldwide.
- Ensuring fair and ethical practices in the international food trade.
- Facilitating transparent global trade by removing unnecessary technical barriers.

Key Functions of the Codex System:

- Science-Based Operational Limits: Sets maximum permissible levels for food additives, contaminants, toxins, pesticide residues and veterinary drug residues.
- Independent Risk Assessment: Uses scientific evidence from expert bodies such as JECFA to develop objective, science-based food safety standards.
- Standardised Labelling and Hygiene: Develops globally harmonised standards for food labelling, processing, packaging and hygiene practices.
- Global Trade Reference: Serves as the WTO-SPS reference for food safety; stricter national measures generally require scientific justification.

Recent Outcomes of the 49th Session:

- Adoption of India-Led Commodity Standards: The Commission formally adopted standalone international quality benchmarks for Dried Coriander Seeds and Fresh Curry Leaves developed under India's chairmanship, facilitating smoother export channels for South Asian spices. It also adopted unified standards for Vanilla and Large Cardamom developed under India's co-chairmanship.
- Launch of New Cashew Kernels Standard: The CAC49 approved India's targeted proposal to formulate a brand-new international Codex Standard for Cashew Kernels under the Codex Committee on Processed Fruits and Vegetables (CCPFV), aiming to reduce technical trade friction for global tree nuts.
- Election to New Food Technology Groups: India was elected Co-Chair of the newly established Electronic Working Group on New Food Sources and Production Systems (NFPS), putting the nation at the center of evaluating risk analysis principles for future global food technologies.
- Broader Global Safety Revisions: The 49th Session adopted revised global control guidelines to reduce severe foodborne illnesses, specifically targeting the control of Listeria monocytogenes in ready-to-eat products and Campylobacter and Salmonella in poultry.

The SHANTI Vision

Context:

External Affairs Minister launched India's campaign for a 2028–29 non-permanent UNSC seat, unveiling the 'SHANTI' vision centred on international norms, mutual trust, and stronger representation for the Global South.

The SHANTI Vision

About The SHANTI Vision:

What It Is?

- Introduced by External Affairs Minister, SHANTI is a strategic acronym that stands for Securing Holistic Advancement through Norms, Trust and Integrity.
- It serves as the foundational approach and thematic blueprint for India's 2028–29 UNSC campaign, advocating that global peace and prosperity cannot be sustained in a fragmented manner.
- Aim: The vision aims to address the profound paradox of modern global governance, where deep economic and technological connectivity coexists with intense conflict and violence.

Key Features of the SHANTI Vision:

- Amplifying the Global South: Focuses heavily on building an equitable world order where the voices, financial concerns, and developmental challenges of the Global South are heard and integrated into mainstream decision-making.

- Technological and Realistic Peacekeeping: Advocates for better-equipped, technology-driven, and realistically mandated UN peacekeeping operations, while fully supporting the global Women, Peace and Security agenda.
- CombatingTransnational Threats: Prioritizes strong, coordinated international legal frameworks to combat terrorism, handle climate change impacts, and ensure comprehensive maritime security across global shipping lanes.
- Responsible Technology Norms: Promotes the creation of transparent global norms to guide the responsible and safe deployment of emerging technologies, preventing their misuse by state or non-state actors.
- Leveraging Development Partnerships: Emphasizes India's practical history as a trusted development partner—evidenced by active Indian-funded infrastructure projects running across 79 countries—to promote dialogue over conflict.

India and the UNSC: History and Membership

- The Non-Permanent Membership Framework: The UNSC has 5 permanent and 10 elected members, with non-permanent members serving two-year terms after securing a two-thirds UNGA majority.
- Historical Service Record: India has served as a non-permanent UNSC member eight times (1950–51 | 1967–68 | 1972–73 | 1977–78 | 1984–85 | 1991–92 | 2011–12 | 2021–22), most recently during 2021–22, demonstrating its sustained role in global security affairs.
- Unrivaled Peacekeeping Contributions: India has contributed nearly 3 lakh personnel to about 50 UN peacekeeping missions, making it one of the world's leading contributors to international peace and security.
- Pushing for Structural Reform: India seeks expansion of both permanent and non-permanent UNSC membership, arguing that the 1945-era structure fails to represent contemporary geopolitical realities and the Global South.

Should India restart dialogue with Pakistan?



Context:

A recent public appeal by eminent citizens urging India and Pakistan to resume dialogue has revived debate over whether diplomatic engagement should restart after nearly a decade of suspended structured talks, recurring terrorist attacks, and military tensions.

Should India restart dialogue with Pakistan?

AboutShould India restart dialogue with Pakistan?

What it is?

- The debate focuses on whether New Delhi should alter its long-standing stance of terror and talks cannot go together to resume official engagement with Islamabad. Formal bilateral dialogue has been frozen since 2016 following the Pathankot and Uri terror strikes.
- This breakdown was further exacerbated by major attacks in Pulwama (2019) and Pahalgam (2025), along with India's subsequent military responses like Operation Sindoor.

Current Status of India-Pakistan Relations:

- A Decade of Diplomatic Freeze: No formal, government-level comprehensive dialogue has taken place between India and Pakistan since 2016.
- The Post-2025 Hostility Baseline: Following the 2025 Pakistan-backed terror strike in Pahalgam and India's retaliatory military response (Operation Sindoor), bilateral ties remain highly strained.
- Suspension of Non-Military Treaties: Following the recent border escalations, India took unprecedented non-military punitive actions, including closing the border, cutting off trade, and suspending the Indus Waters Treaty.
- The Ascendancy of Field Marshal Munir: Pakistan's internal power structure has shifted toward total military consolidation under Field Marshal Asim Munir, rendering the civilian government under Shehbaz Sharif operationally weak.
- Active Track-II Channels: While formal state diplomacy is frozen, informal Track-II meetings between retired diplomats and military officers have quietly continued in neutral venues like Sri Lanka and Thailand.

Arguments in Favor of Restarting Dialogue:

- The Nuclear Escalation Mitigation: Maintaining open lines of communication is crucial for two adjacent nuclear-armed states to manage miscalculations.
- Example: In the recent past, when an Indian BrahMos missile was accidentally fired into Pakistan, raw military-to-military communication successfully prevented a dangerous conventional response.
- Historical Precedent with Military Regimes: India has historically achieved its most significant breakthroughs when dealing directly with Pakistan's military leaders rather than weak civilian premiers.
- Example: General Ayub Khan signed the Indus Waters Treaty, General Zia-ul-Haq broke the deadlock on Siachen, and General Pervez Musharraf formulated the historic four-point solution framework for Kashmir.
- Strategic Validation and Leadership: Senior nationalist leaders have indicated a willingness to decouple regional deterrence from complete diplomatic isolation.
- Resolving SharedEnvironmental Crises: Joint survival challenges require transnational cooperation independent of territorial disputes.
- Example: Seasonal stubble burning across Punjab and the Indus plains triggers a massive, shared public health crisis that can only be mitigated via cross-border environmental planning.
- Preventing a Combined Two-Front Threat: Engaging Islamabad allows India to stabilize its western frontier and focus its strategic capital on long-term boundaries.
- Example: Lowering daily friction with Pakistan limits the risk of collusive military provocations coordinated alongside China.

Arguments Against Restarting Dialogue:

- The Institutionalization ofCross-Border Terrorism: Yielding to unconditional talks rewards asymmetric warfare and undermines the sacrifices of security personnel.
- Example: General Asim Munir's rise within Rawalpindi was directly accelerated by organizing the highly destructive 2025 Pahalgam terror strike.
- The Moral Hazard of Rewarding Aggression: Initiating dialogue without verifiable security metrics violates India's established Zero Tolerance towards Terrorism doctrine.
- Example: External Affairs Minister S. Jaishankar explicitly stated that the era of uninterrupted dialogue with Pakistan is over because actions carry heavy consequences.
- Rawalpindi's Vested Interest in Conflict: The Pakistani military elite lacks structural motivation to preserve long-term regional peace.
- Example: If permanent stability is achieved with India, the Pakistani armed forces lose their dominant political and economic hold over their domestic state apparatus.
- Negotiating with a State in Internal Chaos: Internal economic crashes and deep political infighting leave Islamabad without a reliable, unified representative to execute international treaties.
- Example: The widespread civil protests across Gwadar and Pakistan-occupied Kashmir (PoK) demonstrate that the current regime is focused on managing domestic survival rather than executing peace blueprints.
- High Domestic Political Cost of Failure: Past attempts by Indian leaders to extend olive branches have historically been met with immediate cross-border betrayals.
- Example: Atal Bihari Vajpayee's historic 1999 bus journey to Lahore was immediately followed by the Kargil infiltration, and PM Modi's impromptu 2015 visit to Lahore was answered by the Pathankot airbase attack.

Way Forward:

- Conditioning Dialogue on VerifiableAnti-Terror Actions: Limit state-level talks until Pakistan shows credible, verifiable progress in closing terrorist training camps operating from its territory.
- Prioritizing People-Centric Functional Cooperation: Initiate talks on non-territorial, low-stakes issues like air pollution, climate change, and restoring limited medical visas.
- Formalizing the India-Pakistan Nuclear Security Track: Focus initial security conversations on nuclear safety and establishing automated early warning hotlines to prevent accidental conventional conflicts.
- Intensifying Back-Channel and Track-II Signal Testing: Utilize informal meetings between retired military officers in neutral venues to test diplomatic positions before bringing them to official government tables.

- Reopening the Attari-Wagah Border for Restricted Trade: Gradually restore essential land-border commerce to relieve supply chain pressures affecting ordinary citizens on both sides of the border.

Conclusion:

Restarting a comprehensive dialogue with Pakistan presents a difficult challenge for India's foreign policy establishment. While maintaining channels of communication is vital for two nuclear-armed neighbors to manage escalations, resuming unconditional talks without verifiable anti-terror commitments risks legitimizing cross-border violence. Ultimately, New Delhi must balance its hardline stance against terrorism with flexible, low-stakes functional cooperation on shared environmental threats to ensure regional stability.

India-Australia Roadmap for Sports Collaboration

Context:



India and Australia unveiled the India-Australia Roadmap for Sports Collaboration, building upon the 2023 MoU on Cooperation in Sports.

- The roadmap aims to deepen cooperation ahead of the 2030 Commonwealth Games in Ahmedabad and the Brisbane 2032 Olympic and Paralympic Games.

India-Australia Roadmap for Sports Collaboration

AboutIndia-Australia Roadmap for Sports Collaboration:

What It Is?

- The India-Australia Roadmap for Sports Collaboration is a bilateral framework that identifies practical, future-focused areas of cooperation in sports, including capacity building, sports science, major events, industry investment, and women's participation.
- Aim: To strengthen bilateral sports cooperation by sharing expertise, technology, infrastructure, and best practices while developing athletes, coaches, institutions, and the sports industry in both countries.

Key Features:

- Capacity Building and Coaching: Promotes high-performance sports centres, Para sports, coach exchanges, physical education programmes, yoga, and scholarships for talented Indian athletes.
- Sports Science and Technology: Encourages joint research in athlete analytics, injury prevention, sports nutrition, wearable technologies, recovery techniques, and Para sports.
- Major Sporting Events Cooperation: Facilitates knowledge-sharing for hosting mega events, reciprocal use of sports facilities, youth competitions, and promotion of sports such as Kabaddi, Kho Kho, AFL, and basketball.
- Sports Industry andWomen's Participation: Promotes bilateral investment in sports manufacturing, media, start-ups, and event management while advancing women's leadership, health, participation, and economic empowerment through sports.

Significance:

- Australian expertise in high-performance coaching, sports science, Para sports, and event management can enhance India's preparations for major international competitions.
- Sports diplomacy creates stronger people-to-people ties and opens new opportunities in education, technology, manufacturing, investment, and cultural exchange.

Partnership on Cyber, Critical Technologies and Supply Chains (PACTS)

Context:



During the 3rd India-Australia Annual Summit in Melbourne, Prime Ministers of India and Anthony Albanese launched the Australia-India Partnership on Cyber, Critical Technologies and Supply Chains (PACTS).

Partnership on Cyber, Critical Technologies and Supply Chains (PACTS)

AboutPartnership on Cyber, Critical Technologies and Supply Chains (PACTS):

What It Is?

- PACTS is a comprehensive intergovernmental technology alliance designed to unify, manage, and scale up bilateral cooperation between India and Australia. Shifting from simple policy dialogue to active co-development, the partnership coordinates initiatives across the private sector, universities, research bodies, and state institutions to develop products that drive both economic growth and national security.
- Nations Involved: The agreement is bilaterally driven and executed by the Republic of India and the Commonwealth of Australia.
- Aim: The objective of PACTS is to secure the technological ecosystem of the Indo-Pacific against foreign interference and supply disruptions.

Key Features and the Five Operational Pillars:

- Pillar 1: Supply Chain Resilience and Diversification: Builds secure hardware supply chains through trusted vendor frameworks, semiconductor plant protection, critical mineral security, and safeguarding undersea cables under the Quad Partnership for Cable Connectivity and Resilience.
- Pillar 2: Critical Technology Innovation: Promotes joint research and standards for emerging technologies, including safe AI guidelines, large language models (LLMs), space cooperation, biotechnology, and telecommunications.
- Pillar 3: Comprehensive Cybersecurity: Strengthens critical infrastructure through a bilateral ICT mechanism against cybercrime, joint technical workshops, UN-level data governance coordination, and a cyber-tech skill incubator.
- Pillar 4: Indo-Pacific Digital Resilience: Promotes India's Digital Public Infrastructure (DPI) principles across developing Indo-Pacific economies through pilot projects in healthcare, education, and clean energy.
- Pillar 5: Multi-Domain Defence Research: Connects India's DRDO with Australia's DSTG to co-develop advanced materials and maritime surveillance systems while linking defence startup ecosystems.
- High-Level Bilateral Architecture: PACTS is overseen by a senior executive committee co-chaired by India's Deputy NSA and Australia's Deputy Secretary of the International and Security Group, supported by an annual Senior Officials Meeting.

A 'G Minus Two' for Indo-Pacific

Context:

Strategist C. Raja Mohan highlighted the rise of a G Minus Two Indo-Pacific architecture, where middle powers like India deepen regional partnerships while maintaining strategic autonomy amid evolving US–China relations.



A 'G Minus Two' for Indo-Pacific

AboutA 'G Minus Two' for Indo-Pacific:

What it is?

- The G Minus Two strategy represents a practical adaptation by major Asian middle powers to expand their strategic room for maneuver outside the constricting frameworks of the US and China. It rejects the binary idea of a G2 duopoly (a US-China condominium) deciding the fate of Asia.
- Instead of forming an independent, isolated third bloc or an anti-China military alliance, G Minus Two is an overlapping network of bilateral and minilateral partnerships.

Origin and Background of the G Minus Two Strategy:

- Anxiety Over aU.S.-China Duopoly: Historically, Indian and Asian strategists have been deeply uneasy about a potential G2 superpower axis, where Washington and Beijing dictate regional terms.
- U.S. Foreign Policy Flux: Anxieties were reinforced by Washington's mercurial diplomacy, including occasional decisions by the U.S. administration to downplay Indo-Pacific terminology, creating an incentive for Asian nations to take matters into their own hands.

- The Surge in High-LevelAsian Engagements: The momentum for this strategy accelerated in mid-2026, highlighted by Japanese Prime Minister Sanae Takaichi's visit to Delhi and South Korean President Lee Jae-myung's strategic summits.
- Deep Security Ties with the West: Far from turning its back on the U.S., the strategy relies on binding Washington closer to Asian stability, acknowledging that regional nations alone cannot balance China's massive military weight.
- The Paradox of Interdependence: The architecture acknowledges that complete commercial decoupling from China is impossible due to over a trillion dollars in combined regional trade.

Opportunities of the G Minus Two Framework:

- De-RiskingSupply Chain Vulnerabilities: Middle powers can secure critical industrial sectors against unilateral weaponization or arbitrary export restrictions.
- Example: Japan's recent Economic Security Initiative and South Korea's chip pacts with India help protect high-technology trade networks.
- Securing Maritime Chokepoints: Deeper maritime cooperation insulates trade lanes from sudden blockades.
- Example: Partnering with Indonesia—the geographical heart of the Indo-Pacific—secures vital trade routes through the Strait of Malacca and the confluence of the two oceans.
- Alternative Industrial Sourcing Networks: Middle powers can swap economic specializations to bypass dependencies on single nations.
- Example: Australia serves as an indispensable anchor for critical minerals, while New Zealand opens pathways for advanced agricultural technologies and higher education.
- Deepening Regional Defense Integration: Minilateral logistics and co-development programs improve regional defense capabilities without requiring formal, restrictive treaty alliances.
- Example: India and Indonesia's recent agreement to supply BrahMos cruise missiles and Astra beyond-visual-range missiles significantly expands sub-regional deterrence.
- EnhancingFinancial Resilience: Regional networks can minimize exposure to weaponized western currency rails.
- Example: The ongoing push for local currency transactions and linked payment systems between India and Japan insulates bilateral trade from global currency shocks.

Impacts on India:

- Expanding Strategic Space: The G Minus Two concept frees New Delhi from being caught in a direct tug-of-war between Washington and Beijing, widening its diplomatic options.
- AcceleratingDefense Industrialization: Partnering with advanced Asian militaries directly boosts domestic manufacturing goals.
- Example: The finalization of the naval radio antenna co-development project with Japan brings critical defense technology under the Make in India framework.
- Transforming Borderlands and Sub-Regions: De-risking strategies allow India to integrate its remote territories directly into global supply lines.
- Deepening Neighborhood Strategic Depth: It bridges old policy gaps, linking India's maritime safety with ASEAN centrality.
- Example: Hard, practical defense transfers to Southeast Asian partners like the Philippines and Indonesia reinforce India's role as a trusted security provider.
- Elevating India'sMultilateral Heft: Building strong ties with key regional industrial hubs strengthens India's candidacy for expanded leadership roles in international bodies like the IEA and a reformed UNSC.

Way Forward:

- Expediting the 7,000-Kilometer High-Speed Rail Grid: Work with Japanese engineering consortia to advance internal transport modernizations, ensuring priority corridors open on time by 2027.
- Operationalizing the 1,000 Biogas Plant Pipeline: Fast-track the newly signed Cooperative Biogas for Growth Initiative with Japan to insulate India's rural economy from global energy volatility.
- RedesigningMicro-Irrigation Frameworks for Smallholders: Scale up smart water infrastructure with Asian tech partners to counter severe groundwater depletion across central and western states.

- Enacting Rigid Legal Protections Against Data Extraction: Establish strict guardrails for sovereign datasets to ensure domestic information is not scraped by foreign AI monopolies without fair compensation.
- Accelerating Domestic Economic Reforms: Recognize that the ultimate success of the G Minus Two approach depends heavily on India updating its internal business environment and strengthening its own defense industrial base.

Conclusion:

By building resilient economic and defense ties with capable middle powers like Japan, Indonesia, and Australia, India has found a practical way to manage China's rising military weight while safeguarding its own strategic space. Ultimately, as global supply lines face ongoing volatility, the depth of these regional partnerships will depend on India's commitment to internal economic modernization and defense self-reliance

The ASEAN-India Trade in Goods Agreement (AITIGA)

Context:

India hosted the 13th ASEAN-India Trade in Goods Agreement (AITIGA) Joint Committee and related sub-committee meetings at Vanijya Bhawan, New Delhi.



The ASEAN-India Trade in Goods Agreement (AITIGA)

About The ASEAN-India Trade in Goods Agreement (AITIGA):

What It Is?

- The ASEAN-India Trade in Goods Agreement (AITIGA) is a comprehensive, multilateral free trade agreement (FTA) signed between India and the Association of Southeast Asian Nations (ASEAN). It establishes a legal and tariff framework governing merchandise trade, cutting import duties on thousands of products to deepen regional supply chains and economic integration.
- Signing and Enforcement: The initial agreement was signed on August 13, 2009, and officially came into force on January 1, 2010.
- Host Venue: Vanijya Bhawan, New Delhi, India, running in a hybrid format.
- Participation: Included delegations from all 10 ASEAN Member States: Brunei, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, the Philippines, Singapore, Thailand, and Vietnam.

Aim:

- To rewrite trade codes to create a more balanced and sustainable trade ecosystem, directly addressing the concerns of domestic Indian manufacturers who face asymmetric tariff structures.
- To lower cross-border transaction costs for businesses by making the rules of trade simpler, more user-friendly, and highly trade-facilitative.

Key Functions of the Agreement:

- National Treatment and Market Access (SC-NTMA):This committee ensures imported goods receive treatment similar to domestic products while reducing non-tariff barriers to improve fair and smoother market access between ASEAN and India.
- Rules ofOrigin Enforcement (SC-ROO): It verifies whether products genuinely originate from ASEAN or India by applying strict origin rules, preventing third-country goods from unfairly claiming preferential tariff benefits.
- Customs Procedures and Trade Facilitation (SC-CPTF):The committee simplifies customs procedures through digital systems, transparent documentation, and faster border clearances, reducing trade costs and improving supply chain efficiency.
- Comprehensive Standard Synchronization:It harmonizes Sanitary and Phytosanitary (SPS) measures and Technical Barriers to Trade (TBT) standards, ensuring common safety and quality norms while minimizing unnecessary trade restrictions.

The BRICS adopts Guwahati Declaration

Context:



Under India's 2026 BRICS Chairship, the heads of anti-drug agencies from the expanded member nations officially adopted the Guwahati Declaration.

The BRICS adopts Guwahati DeclarationThe BRICS adopts Guwahati Declaration

AboutThe BRICS adopts Guwahati Declaration:

What It Is?

- The Guwahati Declaration is a comprehensive, multi-lateral security pact signed by the heads of anti-drug enforcement agencies across the expanded BRICS
- It establishes a modernized, unified framework to combat the global narcotics trade, transnational organized syndicates, and the financial tracking vulnerabilities that enable international money laundering.
- Aim: The objective of the declaration is to build a fast, high-trust border-free law enforcement network that balances technology-driven interdiction with evidence-based social demand reduction.

Key Outcomes of the Declaration:

- Synthetic & Precursor Networks: Member states will monitor precursor chemicals and share intelligence to shut down illegal synthetic drug laboratories.
- Cyber & Darknet Exploitation: All members will jointly track anonymous crypto transactions and dismantle illicit online narcotics marketplaces.
- Real-Time Intelligence Sharing: Live operational data exchange on smuggling routes will enable immediate, cross-border law enforcement actions.
- BRICS Virtual Working Group: India's proposed digital platform will facilitate continuous information exchange and agency capacity-building.
- People-Centric Demand Reduction: Enforcement is balanced with public health via rehabilitation, treatment, and youth awareness campaigns.

Strategic Significance:

- India's Network-Centric Model: The pact validates India's Zero-Tolerance approach and boosts its 2026–2029 Vision on Narcotics Control.
- Expanded Bloc Cooperation: The agreement successfully unites old and newly inducted BRICS members under a single security framework.
- Securing Global Trade Corridors: Joint maritime surveillance will secure vulnerable shipping routes against large-scale cartel smuggling operations.

India-Indonesia Bilateral Relations

Context:



Prime Minister of India paid a State Visit to Indonesia, during which India and Indonesia adopted a Joint Statement to deepen their Comprehensive Strategic Partnership across defence, maritime security, trade, technology, connectivity and multilateral cooperation.

India-Indonesia Bilateral Relations

AboutIndia-Indonesia Bilateral Relations:

What is it?

- India and Indonesia share a Comprehensive Strategic Partnership (CSP), established in 2018, built upon centuries-old civilizational, cultural and maritime linkages.
- The relationship encompasses political dialogue, defence, maritime security, trade and investment, digital economy, energy, space, education, culture, connectivity and multilateral cooperation.

Key Outcomes of theIndia–Indonesia Summit(2026):

1. Strengthened Political & Strategic Partnership:

- Both countries agreed to institutionalise regular summit meetings and strengthen dialogue mechanisms such as the Joint Commission Meeting, Foreign Office Consultations and Parliamentary exchanges to ensure continuous strategic engagement.
- They also decided to deepen cooperation among think tanks, academic institutions and policy experts, promoting greater policy coordination and long-term strategic understanding.

2. Defence & Maritime Cooperation:

- India and Indonesia expanded defence ties through cooperation in the BrahMos Missile System, Air-to-Air Missiles, joint military exercises, defence technology co-production, hydrography,Maritime Domain Awareness (MDA) and capacity building.
- Both countries renewed the Maritime Safety and Security MoU, while Indonesia stationed an International Liaison Officer (ILO) at India's IFC-IOR, Gurugram, enhancing information sharing and Indo-Pacific maritime security.

3. Counter-Terrorism & Cyber Security:

- The two countries reaffirmed a zero-tolerance approach towards terrorism and pledged closer cooperation against terror financing, violent extremism and online radicalisation in line with international standards.
- They also agreed to strengthen collaboration in cyber security, digital forensics,CERT cooperation and protection of critical information infrastructure to tackle emerging cyber threats.

4. Trade & Investment:

- Both sides committed to an early conclusion of the ASEAN–India Trade in Goods Agreement (AITIGA) Review) to improve market access, remove trade barriers and facilitate greater bilateral commerce.
- They established new economic mechanisms such as the Joint Economic & Financial Dialogue and promoted Local Currency Transactions (LCT) between RBI and Bank Indonesia to reduce dependence on third-country currencies.

5. Critical Minerals & Industrial Cooperation:

- India and Indonesia signed agreements to strengthen cooperation in critical minerals, rare earths and steel supply chains, supporting resilient manufacturing ecosystems.
- A Strategic Joint Venture between SAIL and PT Krakatau Steel will explore stainless steel production, technology transfer and industrial collaboration.

6. Health, Agriculture & Energy:

- The two countries signed agreements on health workforce development, medical product regulation, agriculture, food security and fertilizer cooperation to improve public health and agricultural resilience.
- They also agreed to expand cooperation in green hydrogen, LNG, solar energy, bioenergy and other clean energy technologies to strengthen long-term energy security.

7. Connectivity & Digital Economy:

- India agreed to partner in the development of Sabang Port, while both countries advanced Andaman–Aceh connectivity to improve maritime logistics and regional integration.
- They launched the Indonesia Open Network (ION) based on India's ONDC architecture and made progress towards cross-border QR payments and telecommunications cooperation.

8. Science, Space & Emerging Technologies:

- India and Indonesia extended cooperation between ISRO and BRIN, including support for India's Gaganyaan Mission through Indonesia's Biak tracking facilities.
- Both countries also agreed to collaborate in nuclear energy, Artificial Intelligence, scientific research and innovation, strengthening partnerships in emerging technologies.

9. Culture, Education & Tourism:

- India will support the restoration of the UNESCO-listedPrambanan Temple Complex, while 2026–27 will be celebrated as the Tagore–Dewantara Year to commemorate shared cultural heritage.
- The two countries also agreed to expand tourism, visa facilitation, student exchanges, and welcomed the proposal to establish an IIM Bangalore campus in Indonesia.

10. Regional & Global Cooperation:

- Indonesia reaffirmed support for India's BRICS Chairship (2026), while both countries backed UN Security Council reforms, greater representation for the Global South, and stronger ASEAN centrality.
- They reiterated commitment to a free, open and rules-based Indo-Pacific, respect for UNCLOS, freedom of navigation and a stable international order based on international law.

Strategic Opportunities for India:

- A stronger role at Sabang Port enhances India's maritime presence near the Strait of Malacca, improving surveillance and strengthening security across the eastern Indian Ocean.
- BrahMos and Astra exports boost India's defence manufacturing, expand access to ASEAN markets, and support the goal of increasing indigenous defence exports.
- Indonesia's vast nickel reserves provide India with a reliable source of key battery minerals, supporting EV manufacturing and reducing import dependence.
- Expanding UPI and ONDC in Indonesia strengthens India's fintech leadership while creating new opportunities for Indian technology and digital service companies.

Challenges and Roadblocks:

- Indonesia follows a balanced foreign policy and avoids openly confronting China, limiting the scope for deeper India-led strategic or military cooperation.
- India imports large quantities of palm oil and coal from Indonesia but continues to face market access barriers for its own exports.
- Infrastructure projects such as Sabang Port often face bureaucratic delays, regulatory hurdles, and environmental clearances, slowing implementation.
- Integrating Astra missiles with Indonesia's diverse fighter fleet requires complex software integration while safeguarding sensitive defence technologies and intellectual property.

Conclusion:

By securing critical maritime checkpoints and exporting advanced defense hardware like the BrahMos missile, India establishes itself as a foundational security provider in the region. Ultimately, aligning India's Viksit Bharat 2047 goals with the Indonesia Emas 2045 blueprint creates a stable, prosperous, and rules-based Indo-Pacific.

The United Nations Guidelines for Consumer Protection (UNGCP)

Context:



India has been appointed to chair the Ninth Session of the Intergovernmental Group of Experts (IGE) on Consumer Protection Law and Policy, organized by United Nations Trade and Development (UNCTAD) in Geneva, Switzerland.

The United Nations Guidelines for Consumer Protection (UNGCP)

AboutThe United Nations Guidelines for Consumer Protection (UNGCP):

What It Is?

- The United Nations Guidelines for Consumer Protection (UNGCP) is a comprehensive, internationally agreed set of declarations that outline the core characteristics of effective consumer protection legislation, institutional enforcement, and dispute redress systems.
- Though functionally classified as a non-binding soft law instrument, it acts as the primary global blueprint for member states to formulate and harmonize domestic consumer safety laws.

- Established In: First adopted by the United Nations General Assembly under Resolution 39/248 on April 16, 1985, following a long campaign by global consumer associations.
- Significantly expanded in 1999 to integrate sustainable development principles, and heavily revised by the General Assembly in December 2015 to address modern digital landscapes.

Objectives:

- To correct structural economic, educational, and bargaining imbalances that exist between individual consumers and powerful corporate enterprises.
- To provide a foundational legislative skeleton for developing countries to establish functioning domestic consumer protection regimes.

Key Features of the UNGCP:

- Physical Safety & Product Recalls: Requires governments to enforce product safety standards and ensure manufacturers promptly recall defective products or compensate consumers if safety risks emerge.
- Protection of Economic Interests: Protects consumers from unfair contracts, misleading advertisements, fraudulent services, predatory lending, and food adulteration through appropriate legal safeguards.
- Information & Consumer Education: Promotes clear hazard labels, internationally recognized safety symbols, and consumer awareness programmes to encourage informed purchasing and safe product use.
- Digital &E-Commerce Provisions (2015): Extends consumer protection to online markets by promoting data privacy, online dispute resolution, secure digital transactions, and safeguards for cross-border e-commerce.
- Sustainable Consumption: Encourages production of energy-efficient, environmentally friendly goods while promoting responsible consumption to support sustainable development.

Significance:

- The UNGCP established internationally accepted consumer rights and has guided national consumer laws, including India's Consumer Protection Act.
- It provides a common framework for countries to address online fraud, protect digital consumers, and resolve cross-border e-commerce disputes more effectively.

16th India-Japan Annual Summit

Context:

The Japanese Prime Minister Sanae Takaichi paid her first official State Visit to New Delhi for the 16th India-Japan Annual Summit.



16th India-Japan Annual Summit:

About16th India-Japan Annual Summit:

What it is?

- The 16th Annual Summit marks a critical point of bilateral alignment between two of Asia's largest democracies and economic engines. Faced with deep volatility in global energy markets and high maritime security tensions across the Indo-Pacific, the summit focused on building stable, mutually beneficial supply lines.
- The bilateral framework formally connects Japan's updated Free and Open Indo-Pacific (FOIP) strategy with India's Indo-Pacific Oceans' Initiative (IPOI) and MAHASAGAR doctrine to support a rules-based maritime order.

Key Outcomes of the Summit:

1. Defence & Maritime Security:

- UNICORN Antenna Agreement: India and Japan agreed on the remaining technical aspects of the UNICORN project, marking their first defence technology co-development initiative.
- 2+2 Ministerial Dialogue: Both sides decided to hold the 4th India–Japan 2+2 Foreign and Defence Ministers' Meeting in Tokyo before the end of 2026.

- Naval Cooperation: The leaders expanded naval ties through JAIMEX exercises and agreed to cooperate in naval maintenance, repair, and overhaul (MRO) under Make in India.

2. Economic Security & Supply Chains:

- Joint EconomicSecurity Framework: Both countries agreed to strengthen cooperation in semiconductors, critical minerals, clean energy, ICT, and pharmaceuticals.
- High-Tech Trade Facilitation: They agreed to ease export controls, promote secure technology trade, and encourage local currency transactions.

3. Energy & Clean Transition:

- CBG Initiative: Launched the India–Japan Cooperative Biogas for Growth Initiative to support India's target of 1,000 biogas plants.
- Odisha Green Energy Project: Reaffirmed cooperation for the Odisha green hydrogen and clean ammonia production project.
- Energy Security Cooperation: Signed an Energy Resilience Statement on strategic petroleum reserves, while Japan supported India's IEA membership.

4. Technology & Infrastructure:

- AI Strategic Dialogue: Established a new AI Strategic Dialogue to promote trusted and secure artificial intelligence cooperation.
- High-Speed Rail Partnership: Japan reaffirmed support for the Mumbai–Ahmedabad Bullet Train and future high-speed rail projects.
- Regional Infrastructure Projects: Advanced JICA-supported projects including Mumbai Metro, Bengaluru Metro, healthcare, education, and horticulture.

Strategic Opportunities:

- Accelerating a $1 Trillion Investment Pipeline: The summit positioned Japan to channel large-scale capital investments across Indian states, supporting the national goal of Viksit Bharat.
- Modernizing the Indo-Japan CEPA: Reviewing the 15-year-old Comprehensive Economic Partnership Agreement (CEPA) provides an opportunity to diversify trade and lower commercial tariffs.
- Developing the North Eastern Region (NER): Japan's support helps build industrial value chains connecting India's Northeast with the Bay of Bengal and BIMSTEC zones.
- Democratizing the Alternative Hardware Ecosystem: Collaborative R&D under the Sakura Science Exchange and joint space missions like LUPEX (Lunar Polar Exploration) help India reduce single-vendor technology monopolies.
- Integrating Tier-II and Tier-III Small Businesses: The newly inaugurated India-Japan SME Forum allows Indian micro, small, and medium enterprises (MSMEs) to integrate directly into advanced Japanese corporate supply chains.

Key Geopolitical Challenges:

- AddressingEconomic Coercion and Monopolies: Both nations face high supply chain vulnerabilities due to non-market export restrictions on critical minerals controlled by dominant regional powers.
- Managing Maritime Chokepoint Disruptions: Ongoing regional conflicts in West Asia directly threaten trade stability; for instance, 31 Japanese commercial vessels remain stranded near the critical Strait of Hormuz.
- CounteringRegional Militarization: Growing military expenditure and the militarization of disputed features in the South China and East China seas create ongoing friction for Indo-Pacific shipping lines.
- Navigating Cross-Border Cyber and Terror Threats: The summit highlighted the collapse of legacy arms-control agreements alongside complex non-traditional security threats, including cross-border cyber infiltration and regional terrorism.
- Reconciling Technical and Labor Differences: Replicating advanced high-speed mobility systems requires bridging gaps between Japan's specialized engineering standards and India's local labor frameworks.

EXCEL CIVILS ACADEMY EMPOWERING FUTURE LEADERS

Way Forward:

- Executing the UNICORN Defense Project Timeline: Swiftly conclude the remaining technical clearances for the UNICORN naval antenna to demonstrate successful co-development before the upcoming 17th Annual Summit.
- Expanding India'sStrategic Petroleum Reserves: Leverage Japan's technical expertise to build secure underground crude oil stockpiles, insulating both economies from supply shocks in the Persian Gulf.
- Operationalizing the 2027 High-Speed Rail Deadline: State and central authorities must work together to ensure the priority sections of the Mumbai-Ahmedabad High-Speed Rail meet the 2027 launch target.
- Enforcing Domicile-Portable Digital Payment Links: Integrate local currency transaction systems and NPCI payment structures to allow seamless retail transactions for businesses and tourists.
- Launching the Trilateral Dialogue with the Philippines: Advance preparations to execute the newly planned trilateral 1.5 track policy dialogue with the Philippines to improve maritime domain awareness in the South China Sea.

Conclusion:

By matching a trillion-dollar investment pipeline with defense agreements like the UNICORN antenna project, the two nations have successfully moved past standard trade ties toward deep technological co-development. Moving forward, executing strategic petroleum stockpiles, stabilizing critical mineral supplies, and completing the 2027 high-speed rail link will remain vital to protect their economic security and ensure lasting regional peace.

EXCEL CIVILS ACADEMY
EMPOWERING FUTURE LEADERS

Chapter-
9

SOCIAL ISSUES

The Atmanirbhar Panchayat Programme

Context:



Union Minister of Panchayati Raj, launched the Atmanirbhar Panchayat Programme and the SAMARTH Panchayat Portal.

The Atmanirbhar Panchayat Programme

AboutThe Atmanirbhar Panchayat Programme:

What It Is?

- An initiative by the Ministry of Panchayati Raj anchored under the Rashtriya Gram Swaraj Abhiyan (RGSA). It assists Gram Panchayats and Block Panchayats in identifying idle local assets and untapped opportunities, converting them into bankable, revenue-generating projects.
- Ministry: Ministry of Panchayati Raj, Government of India.
- Aim: To build sustainable Own Sources of Revenue (OSR) for Panchayati Raj Institutions, reducing their fiscal dependency on central and state grants.

Key Features:

- Project Scale & Phasing: Targets the development of 350 projects over 4 years (50 projects in Year 1, followed by 100 projects annually in Years 2, 3, and 4).
- Eligibility Thresholds: Open to Gram Panchayats with a minimum annual OSR of 50 lakh and Block Panchayats with a minimum annual OSR of 1 crore, provided they have at least 3 years of tenure remaining (with relaxed criteria for Special Category States).
- Technical Guidance: Offers dedicated technical assistance from the Ministry to structure local ideas into commercially viable, bankable project proposals.
- Diversified Financing: Leverages blended finance models including Public-Private Partnerships (PPP), Corporate Social Responsibility (CSR) contributions, scheme convergence, and institutional bank credit.

Aboutthe SAMARTH Panchayat Portal:

What It Is?

- The SAMARTH Panchayat Portal is a unified, configurable national digital platform designed for end-to-end management of Own Sources of Revenue (OSR) for Gram Panchayats.
- Aim: To digitize, streamline, and standardize the complete OSR lifecycle—improving fiscal transparency, tax collection efficiency, and accountability in rural tax administration.

Key Features:

- CompleteEnd-to-End Lifecycle Management: Handles taxpayer registration, automated demand notice generation, online digital payment processing, receipt collection, and real-time revenue monitoring.
- Standardization of Local Taxes: Digitizes local revenue streams including property taxes, user charges, trade licenses, and non-tax fees.
- Proven Onboarding Track Record: Already active in Chhattisgarh and Himachal Pradesh, with over 51 lakh taxpayers registered, demand notices worth 95 crore generated, and more than 27 crore collected.
- PhasedPan-India Expansion: Onboarding is currently underway across Maharashtra, Mizoram, Assam, Haryana, West Bengal, and Uttar Pradesh.

EXCEL CIVILS ACADEMY
EMPOWERING FUTURE LEADERS

Women's Work Participation in India

Context:



Economist highlights that India's economic objective of becoming a developed nation (Viksit Bharat) by 2047 cannot be achieved without structurally increasing women's work participation.

Women's Work Participation in India

AboutWomen's Work Participation in India:

What it is?

- Women's work participation in India refers to the proportion of the female working-age population engaged in paid, productive employment across formal and informal sectors. Historically low by international standards, India's female Work Participation Rate (WPR) has experienced a U-shaped structural curve, declining as rural women withdrew from manual agricultural work without a corresponding absorption into formal non-farm or manufacturing jobs.

Key Data and Statistics on Women's Employment:

- Growth Multiplier Potential: A 10-percentage-point increase in India's female WPR could add nearly 2 percentage points directly to national GDP growth.
- Rising Rate of Inactive Youth: The number of young women (aged 15–29) neither looking for work nor in education grew from under 70 million prior to 2004 to over 100 million by 2018.
- Distress-Driven Re-entry into Farms: The post-2020 rise in female participation was largely driven by rural economic distress, forcing women into unpaid family labor (UFL) in agriculture.
- North-South Industrial Disparity: Tamil Nadu, possessing just 5%–6% of the national population, hosts over 40% of India's female factory workforce due to strong garment, electronics, and hostel infrastructure.

Reasons Behind Low andDistress-Driven Female Participation:

- Capital-Intensive Economic Growth: Recent GDP growth has concentrated in high-skill, capital-intensive sectors like finance and IT, which do not absorb large volumes of workers.
- Decline ofLabor-Intensive Manufacturing: Key labor-absorbing sectors like textiles, food processing, and garments experienced absolute drops in employment between 2013 and 2019.
- Mechanization and Agricultural Shift: Farm mechanization reduced the demand for rural manual labor, while shrinking non-farm alternatives left educated young women without suitable jobs.
- Social Norms and Safety Constraints: Entrenched gender expectations, limited physical mobility, and a lack of safe housing and transport facilities restrict young women's entry into formal urban jobs.

Significance of Increasing Female Workforce Participation

- Expanding Aggregate National Output: Raising female participation increases the overall labor supply, expanding the economy's productive capacity and total economic output.
- Boosting Household Incomes and Savings: Transitioning women into paid employment directly increases household earnings, stimulating consumer demand and private savings.
- Intergenerational Human Capital Gains: Higher female earnings translate directly into improved child nutrition, health, and educational attainment, building long-term national human capital.
- EnhancingWorkplace Productivity and Innovation: Gender-diverse workforce environments increase workplace efficiency, creativity, and competitive capability across industries.

Way Forward:

- Targeting Labor-Intensive Industrial Policy: Provide direct policy support to labor-absorbing sectors like garments, footwear, food processing, and light electronics assembly.
- Replicating Women-Enabling Infrastructure: Expand female literacy, dedicated working-women hostels, and safe public transportation networks modeled on Tamil Nadu's industrial clusters.
- Investing in Public Health andBasic Education: Direct state investments into healthcare and universal public education across Hindi-belt states to eliminate high malnutrition and stunting rates.

- Transitioning Women Out of Unpaid Agriculture: Create formal, non-farm wage employment opportunities to shift rural women away from unremunerated family farm labor.

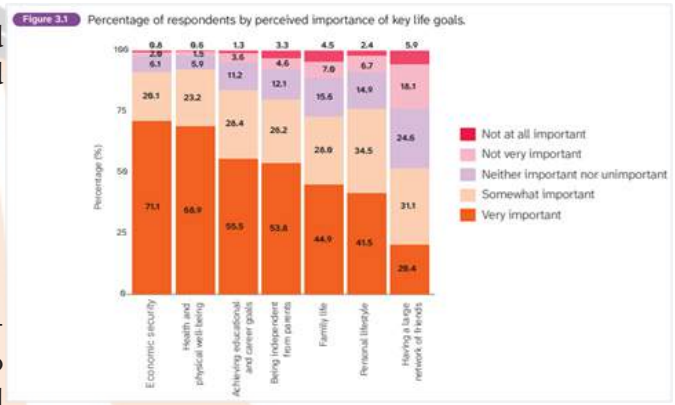
Conclusion:

India cannot achieve its vision of becoming a developed nation (Viksit Bharat) while excluding half of its population from formal, productive work. Addressing the ongoing job crisis requires shifting economic policy toward labor-intensive manufacturing and providing supportive social infrastructure for women workers. Ultimately, enabling educated young women to move from unpaid domestic roles into formal employment will serve as the single strongest engine for sustained, long-term national growth.

The UNFPA Demographic Futures Survey 2026

Context:

The United Nations Population Fund (UNFPA) published its groundbreaking global study, the Lives, Choices and Futures — Demographic Futures Survey 2026.



UNFPA

About The UNFPA Demographic Futures Survey 2026:

What it is?

- The Demographic Futures Survey 2026 is a cross-national, global study designed by UNFPA to examine the aspirations, relationship patterns, and family decisions of young adults aged 18–39. Sampling 108,926 internet-connected young adults across 73 countries and territories, it provides comparative data on how economic, social, and institutional factors shape transitions to adulthood.

Key Findings of the Report:

- Persistence of Marriage Ideals: Over two-thirds of surveyed young adults prefer a living arrangement that includes marriage—36% favoring marriage before cohabitation and 34% after cohabiting.
- Aspiration vs. Reality Gap: Among respondents aged 25–39 who wish to marry or live with a partner, 25% are currently single and not dating, with a higher share among men (30%) than women (19%).
- EconomicDemands for Partnership: Financial security is rated as the most critical consideration for entering a partnership (81%), with economic and housing barriers listed as primary obstacles (57%).
- Preconditions for Parenthood: Financial stability (88%), stable employment (87%), and emotional readiness (85%) rank as the top three non-negotiable thresholds before having children.
- Personal Joy Over Policy Drivers: 80% of respondents state that the joy and happiness children bring is their top motivation for parenthood, whereas state incentives and workforce contributions rank among the lowest motivators.
- Structural Barrier to Family Size: Economic and housing constraints represent the single highest barrier to parenthood globally (72%), followed by the lack of a suitable partner and reproductive health concerns.
- DecliningAchieved Fertility: Across all world regions, the average number of children among older respondents (aged 35–39) is consistently lower than the ideal number reported by younger cohorts (aged 18–39).
- Indian Specific Trends: In India, women aged 18–39 desire an ideal family size of 2.1 children (compared to an actual average of 1.0 child among those aged 35–39), while Indian men report an ideal of 2.2 children (versus 1.1 actual).

Positives Identified in the Survey:

- ResilientYouth Optimism: Roughly two-thirds (66%) of global respondents feel positive about their future, led by high optimism in West & Central Africa (62% very positive).
- High Desire for Parenthood: Among childless respondents aged 35–39 in India, nearly 85% express a strong desire to become parents if conditions permit.
- Perception of Opportunities: 58% of respondents agree that young people in their countries have strong life opportunities, particularly across developing economies.

- Digital & Social Networking Channels: Personal networks (33%), work/school (28%), and digital platforms (16%) provide reliable avenues for young adults to find compatible partners.

Key Challenges Identified:

- Severe Economic and Housing Constraints: Rising living costs, expensive housing, and job market instability delay both partnership formation and family expansion.
- Macro-Environmental Anxiety: Over three-quarters of young adults report being deeply worried about conflict, security risks, economic insecurity, and social inequality.
- Unequal Distribution of Care: Traditional gender expectations persist; respondents show significantly higher disapproval when a mother works full-time with a child under three (29%) compared to a father in the same situation (20%).
- Lack of Perceived State Support: Only 39% feel their governments provide adequate institutional support for young people or parents with young children, while similar low numbers cite support for work-life balance from employers.

UNFPA Policy Recommendations:

- Enhance Economic Security & Affordable Housing: Governments must formulate economic policies that ensure stable youth employment, wage growth, and accessible housing frameworks.
- Expand Accessible Childcare & Parental Leave: Strengthen workplace support systems through gender-equitable parental leave and affordable public childcare facilities to balance career and family life.
- Promote Gender Equality inUnpaid Care Work: Address structural gender biases in the labor market and foster societal shifts toward an equitable share of household care responsibilities.
- Adopt a Rights-Based Demographic Framework: Shift population policies away from rigid birth targets toward empowering individual choice, reproductive agency, and institutional support systems.

Conclusion:

The UNFPA 2026 report confirms that falling birth rates are driven by economic and social constraints rather than a declining interest in family life. Young people around the world continue to value marriage and parenthood, but need secure jobs, affordable housing, and supportive public policies to realize these goals. Ultimately, building resilient societies requires governments to address structural inequalities so young adults can freely build the families they desire.

Maharashtra Gives Legal Recognition to Women Farmers

Context:



Maharashtra has become the first Indian state to enact the Maharashtra Women Farmers Empowerment Act, 2026, a landmark law recognizing and protecting the rights of women farmers.

- The Act was introduced during the UN-observed International Year of the Woman Farmer, promoting inclusive and sustainable agrifood systems.

Maharashtra Gives Legal Recognition to Women Farmers

AboutMaharashtra Gives Legal Recognition to Women Farmers:

What it is?

- The Act represents a massive socio-economic shift designed to address deeply entrenched gender inequalities regarding access to land, water, credit, and other vital natural resources. Historically, government agricultural benefits, extension services, and formal bank loans have been legally tied to land ownership, which is overwhelmingly held by men.

Key Data and Statistics onWomen in Agriculture:

- National Female Baseline Comparison: Across India, an average of 73% of the rural female workforce is anchored in agriculture, compared to 47% of rural men.
- The Legislative Milestones Pipeline: The groundwork for the Act builds directly upon the targets of Maharashtra's Fourth Policy for Women (2024), which mandated enhancing the role of women in agricultural income and asset ownership.
- Wide Foundational Framework: The new law covers a broad spectrum of primary production sectors, aligning with India's National Policy for Farmers (2007).

Core Legal Features and Institutional Mechanisms:

- Broad Inclusivity of "Farmer" Status: In line with the National Policy for Farmers (2007), the Act formally includes any woman engaged in crop husbandry, animal husbandry, poultry, fishery, agro-forestry, vermiculture, mushroom cultivation, or primary processing, working either as an owner or a laborer.
- The Woman Farmer Certificate (WFC): Eligible women can apply for a formal WFC through their local Gram Sabha or Nagar Panchayat. This certificate serves as official proof of their occupation, successfully removing the requirement of holding a land title to access state benefits.
- A Unified Digital Registry and Fund: The Act mandates the creation of a centralized digital registry to track certified women farmers, backed by a dedicated state-level empowerment fund to bankroll targeted welfare schemes.
- Two-Tier Administrative Oversight Structure: Implementation will be managed by a State-Level Monitoring Committee headed by the Chief Secretary to facilitate multi-department coordination, while a supreme Governing Council led by the Chief Minister will oversee long-term policy guidance.

Significance and Strategic Opportunities:

- Unlocking Formal Financial Credit: Issuing the WFC helps women farmers clear rigid banking checks, allowing them to secure formal crop insurance and low-interest institutional loans without pledging land as collateral.
- Targeted Support for Vulnerable Demographics: The centralized digital registry allows the state to design gender-responsive skill development programs tailored specifically to single, widowed, or marginalized women farmers.
- FosteringClimate Change Resilience: Because global studies show that women are among the strongest drivers of ecological adaptation, giving them legal status helps scale up sustainable practices like vermiculture and agro-forestry.
- Institutionalizing Social Reform Legacies: This law advances the historic social justice legacy of Maharashtra, carrying forward the foundational work of pathbreakers like Jyotirao Phule and Savitribai Phule, who championed women's rights and education.
- Securing Household Decision-Making Power: Legally recognizing women's labor gives them greater control over agricultural income, translating directly into better healthcare, nutrition, and education outcomes for rural families.

Key Challenges in Implementation:

- Overcoming Entrenched Social Resistance: Changing deep-seated patriarchal norms around land inheritance and structural family hierarchies requires continuous legal awareness campaigns at the village level.
- PreventingInstitutional Bottlenecks at the Local Level: Bureaucratic delays within Gram Sabhas or Nagar Panchayats could stall the early verification and smooth rollout of the Woman Farmer Certificates.
- Bridging the Local Digital Divide: Rural women often face limited access to smartphones and digital literacy, which could slow down their enrollment in the state's new digital registry.
- Reaching Displaced Contract Laborers: Extending the Act's benefits to highly mobile, seasonal, and landless migrant female laborers presents a difficult tracking challenge for district enforcement cells.
- Ensuring Inter-Departmental Coordination: Blending new financial allocations across separate state ministries—including Agriculture, Finance, and Women & Child Development—requires constant administrative monitoring.

Way Forward:

- Deploying Mobile WFC Enrollment Camps: Launch localized registration drives at the panchayat level, using frontline officers to help illiterate and single women farmers fill out certificate applications easily.
- Mandating Gender Quotas in Banking Schemes: Coordinate with regional rural banks and NABARD to recognize the Woman Farmer Certificate as a valid document for zero-collateral agricultural credit.
- Establishing the Mining andAgri-Tech Training Matrix: Link the new state empowerment fund with vocational institutes to deliver advanced training in food safety, post-harvest processing, and smart micro-irrigation.
- Enforcing Strict Audits on Scheme Deliveries: Direct the State-Level Monitoring Committee to conduct annual audits, ensuring that at least 30% of all state agricultural subsidies are routed directly to WFC holders.
- Launching Vernacular Legal Awareness Campaigns: Roll out community radio programs and village theater productions to educate rural households on women's equal rights to land, water, and economic assets.

Conclusion:

By replacing rigid land-ownership requirements with the flexible Woman Farmer Certificate, the law provides a scalable model for recognizing the vital labor of rural women. Ultimately, as climate change and male migration place greater pressure on the countryside, ensuring the smooth execution of this law will be essential to protect national food security and build a fairer, more inclusive rural economy.

The National Investment Policy for Urea-2026 for Atmanirbhar Bharat (NIPU-2026)

Context:



The Cabinet Committee on Economic Affairs (CCEA), chaired by Prime Minister Narendra Modi, officially approved the National Investment Policy for Urea-2026 for Atmanirbhar Bharat (NIPU-2026).

NIPU-2026

AboutThe National Investment Policy for Urea-2026 for Atmanirbhar Bharat (NIPU-2026):

What It Is?

- NIPU-2026 is a newly approved macroeconomic sector-specific investment policy aimed at reviving, expanding, and constructing advanced, domestic natural gas-based urea manufacturing plants. It serves as the programmatic successor to the New Investment Policy (NIP)-2012, whose investment window expired back in October 2019.
- Objectives: The objective of the policy is to add 10 million tonnes of fresh, indigenous urea production capacity by supporting the establishment of eight to nine new natural gas-based fertilizer plants.

Key Features of the Scheme:

- TargetedCapacity Expansion: Aims to create 10 million tonnes of fresh domestic manufacturing capacity by setting up 8 to 9 new natural gas-based manufacturing plants.
- Separation of Fixed and Variable Costs: Calculations for government financial subsidies will explicitly separate fixed and variable costs, ensuring higher transparency and eliminating administrative inefficiencies.
- AssuredReturn on Equity (RoE) Band: Introduces a viable, government-backed RoE band for project developers, guaranteeing a floor rate of 12 per cent and a ceiling rate of 16 per cent to offer high investment certainty.
- Foreign Exchange Risk Mitigation: Project developers are protected against global currency market fluctuations by allowing fixed costs to be converted fully into Indian Rupees (INR) after a period of four years based on prevailing exchange rates.
- Massive Plant-Level Fiscal Savings: Due to structural transparency and cost optimization, these new rules are estimated to save over 250 crore for each plant established compared to the older NIP-2012 rules.

- Addressing Pent-Up Market Proposals: The deployment framework acts as a single-window evaluation platform for various pending industrial factory proposals received by the Department of Fertilizers.

Strategic Significance:

- NIPU-2026 aims to bridge India's nearly 10 million tonne urea deficit, reducing imports and moving the country towards self-sufficiency.
- Clear cost norms and an assured 12–16% RoE reduce investment risks, encouraging greater public and private investment in modern gas-based urea plants.

The Push to Renew Education in India

Context:

An education reform movement gained momentum amid a prolonged protest demanding systemic reforms to curb examination paper leaks and improve governance in the education sector, bringing national attention to the issue.



The Push to Renew Education in India

AboutThe Push to Renew Education in India:

What it is?

- Renewing education in India refers to a structural shift away from standard rot-learning frameworks toward a student-centric system focused on critical thinking, real-world application, and academic excellence. The framework calls for moving past political compromises, treating education as a bipartisan national mission rather than a mechanism for short-term election goals.

Key Data and Statistics on the Indian Education System:

- The Stagnant Vocational Baseline: While enrollment has expanded significantly, nearly 65.3% of the active workforce has received no vocational training of any kind, according to recent economic indicators.
- The Coaching Industry Parallel Fleet: The intense focus on competitive memory tests has created a multi-billion-dollar parallel coaching industry, draining family savings due to rigid, single-window evaluation filters.
- WidespreadInstitutional Deficits: More than 88% of the rural workforce remains trapped in elementary or semi-skilled sectors, reflecting a mismatch between degree inflation and actual industry absorption.
- The Aspirational Renaissance Metric: Structural proposals mandate a three-year hard deadline to convert all major central entrance testing metrics (including JEE, NEET, CUET, and UPSC) entirely into competency-based formats.

Current Issues Plaguing the Indian Education System:

- An Over-Reliance onRote Memorization and Recall: Standard evaluations primarily reward a candidate's memory rather than their capacity for critical analysis.
- Example: High-stakes testing setups require long hours of memorizing facts, causing schools to prioritize memory drills over independent thinking.
- The Rise of a Hyper-Commercialized Coaching Culture: The premium placed on clearing selective competitive entries has led families to rely heavily on parallel coaching centers.
- Example: The clustering of students in coaching hubs like Kota highlights an ecosystem that values intense repetition over deep reflection.
- Persistent Massive VacanciesAcross Public Academies: Long delays in teacher hiring compromise learning quality from primary schools to premier technical institutions.
- Example: Unfilled faculty chairs across central universities and IITs leave thousands of students without consistent, high-quality guidance.
- A Distinct Lack of Autonomy and Administrative Micromanagement: State regulators often impose rigid guidelines on local public institutions, stifling experimental learning.
- Example: Bureaucratic micromanagement of university curricula and pedagogy limits the ability of local departments to respond to regional economic contexts.

Implications of Educational Failures:

- The Stagnation of theDemographic Dividend: Failing to properly train the current youth generation risks turning a major development window into a long-term economic challenge.
- Example: Millions of working-age youths remain underemployed or outside the active labor force due to a lack of marketable technical skills.
- Deepening Inequalities Across Class Lines: Commercial parallel coaching frameworks create structural barriers that favor affluent applicants.
- Example: Lower-income and rural candidates are frequently squeezed out of competitive positions because their families cannot afford expensive private coaching.
- The Growth of Credential Inflation Without Opportunities: Rapidly expanding degree programs without a corresponding growth in formal employment creates widespread social frustration.
- Example: Postgraduates frequently apply for entry-level Group D government posts because the job market cannot absorb their academic qualifications.
- The Erosion of Trust inPublic Schooling Networks: Unequal resource distribution between urban private facilities and rural schools drives low-income families to look for expensive private alternatives.
- Example: Disadvantaged families stretch their finances to pay for private elementary schooling because local public schools lack basic sanitation, laboratories, and libraries.

Way Forward:

- Transitioning to Competency-Based Assessments: Redesign major board and national entrance examinations within three years to evaluate conceptual understanding, creativity, and real-world problem-solving rather than rote recall.
- Dismantling the Monopoly ofParallel Coaching Culture: Reduce the focus on single-day high-stakes tests by giving greater weightage to sustained school performance, student portfolios, and multiple examination windows.
- Launching a National Teacher Excellence Mission: Treat teaching as a highly respected profession by providing rigorous preparation, continuous mentoring, and dedicated research funding modeled on systems in Finland and Japan.
- Filling All Public Teaching Vacancies Within Three Months: Implement transparent, merit-based recruitment drives to fill all operational vacancies from primary Anganwadis to premier central institutes like IITs and AIIMS.
- MandatingPublic Accountability Dashboards and Bipartisan Commissions: Establish an independent, statutory National Education Reform Commission alongside a real-time educational dashboard to track learning outcomes and hold governments accountable.

Conclusion:

Resolving India's educational challenges requires moving past political arguments to treat systemic reform as a vital, bipartisan national mission. If the country continues to reward simple memorization over critical thinking, it risks missing out on its greatest developmental opportunity of the century. Ultimately, transforming personal sacrifice into a national educational renaissance is essential to build a society of innovators who can secure a sustainable future.

The Ladakh Autonomous Hill Development Council (LAHDC) Act

Context:



The Ladakh administration created 17 new tehsils, raising the Union Territory's total to 32, and plans to extend the Ladakh Autonomous Hill Development Council (LAHDC) Act benefits to all seven newly designated districts through suitable legal provisions.

LAHDC

AboutThe Ladakh Autonomous Hill Development Council (LAHDC) Act:

What It Is?

- The Ladakh Autonomous Hill Development Councils Act, 1997 (Act No. XXXI of 1997) is a comprehensive

piece of legislation enacted to provide for the establishment of Autonomous Hill Development Councils and an Inter-District Advisory Council in the Ladakh region. The Act originally extended to the whole of the Leh and Kargil districts.

- Aim: The foundational objective of the Act is to empower local populations in the high-altitude region through decentralized governance.

Key Features of the Act:

- Corporate Legal Entity: Each Council functions as a body corporate named the Ladakh Autonomous Hill Development Council of (name of the district), enjoying perpetual succession, a common seal, and the legal right to acquire, hold, or dispose of property, as well as to sue and be sued.
- Composition Matrix: The Council comprises 26 members chosen via direct election based on adult suffrage from single-member territorial constituencies.
- The government can nominate up to 4 additional members from principal religious minorities and women.
- Sitting MPs and MLAs representing the region serve as ex-officio members but do not hold voting rights in Council meetings.
- Five-Year Term & Quorum: Members serve a standard five-year term from the date of the first post-election meeting. For general meetings, a minimum quorum of ten members is required, and decisions are passed via a simple majority.
- The Executive Council Structure: The executive powers of the Council are vested in a dedicated Executive Council.
- This body consists of the Chairman (who serves as the Chief Executive Councillor or CEC) and four members nominated by the CEC from within the Council, ensuring at least one member belongs to a principal religious minority.
- Administrative Subordination: The Deputy Commissioner (DC) of the district serves as the Chief Executive Officer (CEO) of the Council.
- Control Over Land and Forests: Subject to general state directions, the Council possesses direct executive powers over the allotment, use, and occupation of Khalsa Sarkar (government) land transferred to it, alongside the management of un-demarcated forests.
- The Council Fund Mechanics: The Act establishes a distinct Council Fund operated through government treasuries. All raised revenues, allocation grants from Plan/Non-Plan budgets, and central loans are credited to this fund to finance local developmental projects.
- Taxation and Fee Levies: The Council holds the legislative authority to levy and collect specific local taxes and fees.
- Sovereign Dissolution Safety net: If the Governor finds that a Council is incompetent, defaulting on its legal duties, or abusing its powers, the Governor can officially dissolve the body via the Government Gazette, provided the Council is given a formal notice to respond to the charges. Reconstitution must take place within six months of dissolution.

India's Deferred Future and Demographic Window

Context:



A recent analysis has highlighted concerns that India's demographic dividend is being eroded by delayed public recruitments, inadequate formal employment, low vocational training, and incomplete welfare delivery.

India's Deferred Future and Demographic Window

AboutIndia's Deferred Future and Demographic Window:

What it is?

- The concept of India's deferred future highlights the structural mismatch between a generational demographic opportunity and short-term electoral incentives. Roughly 65% of India's population is in the working-age bracket of 15 to 64 years—a highly favorable dependency ratio that will never recur and will reverse by the early 2040s as this population ages and fertility rates

Key Data and Statistics on India's Employment and Welfare Systems:

- Training Deficit: 3% of India's workforce has received no vocational training.
- Unorganised Workforce: Over 30 crore workers are registered on the e-Shram portal.
- Real Youth Joblessness: Adjusted unemployment among educated youth is approximately 18%.
- Demographic Window: Nearly 65% of India's population is currently in the working-age group.
- Elementary Labour Trap: Around 2% of workers remain in elementary or semi-skilled occupations.
- Headline vs Hidden Unemployment: PLFS records youth unemployment at 2%, but including 2.4 crore discouraged youth, educated youth unemployment rises to about 18%.
- Urban Female Exclusion: Youth unemployment among urban women stands at 20.1%, while female labour-force participation remains just above one-fifth.

Key Challenges and Institutional Anomalies:

- Distorted PublicRecruitment Calendars: Recruitment delays and court cases often extend selection by 3–4 years, trapping aspirants in preparation cycles not fully captured as unemployment by PLFS.
- Political Economy of Incompletion: Pre-election spending and announcements often prioritise politically visible projects and foundation stones over timely project completion.
- Deepening Social Inequalities: Recruitment delays disproportionately hurt first-generation learners and disadvantaged candidates who cannot financially withstand prolonged uncertainty.
- Casualisation of Labour: Growing reliance on contract labour reduces job security, worker protections, and firms' incentives to invest in long-term skill development.
- Incomplete Welfare Delivery: Delayed PMAY and PM-Kisan benefits can leave beneficiaries trapped in prolonged verification processes and continued dependence.

Historical Solutions: Global and Domestic Lessons

- South Korea – Performance-Linked Support: Industrial licences, bank credit, and state support were tied to export and employment targets, making non-performance costly.
- Brazil –Conditional Cash Transfers: Bolsa Família reached over 50 million people, linking benefits to school attendance and health visits to reduce intergenerational poverty.
- Kerala – Decentralised Accountability: The People's Plan Campaign devolved 35–40% of plan funds to local bodies, enabling gram sabhas to scrutinise delayed public projects.
- Germany – Worker Representation and Apprenticeships: Worker representation in corporate governance encouraged firms to invest in vocational training and treat employees as long-term assets.

Way Forward:

- Enforce Project Completion Timelines: Introduce legally binding deadlines and accountability mechanisms for delayed public works.
- Reform Vocational Training: Shift Skill India and PMKVY from short-term certification towards industry-linked, multi-year apprenticeships.
- Ensure Time-Bound Recruitment: Require central and State recruitment agencies to fill vacancies within fixed annual timelines, preferably within 12 months.
- Promote Welfare Graduation: Design welfare benefits to support families' transition towards stable formal employment and economic independence.
- Protect Contract Workers: Ensure fair baseline wages, social protection, and access to employer-supported skill development.

Conclusion:

If the frustrations of the world's largest working-age generation continue to be channeled into endless exam preparation and uncompleted welfare waiting loops, the demographic dividend will be permanently lost. Ultimately, moving past this holding pattern requires shifting political metrics from the visibility of an announcement to the reality of completion, ensuring the next generation can build true economic security before the clock runs out.

The ULLAS Initiative

Context:

Uttarakhand was officially declared India's sixth fully literate State after Governor Lieutenant General (Retd.) Gurmit Singh approved the formal proposal.

The ULLAS Initiative

AboutThe ULLAS Initiative:

What It Is?

- The ULLAS program—which stands for Understanding of Lifelong Learning for All in Society (also known as the Nav Bharat Saaksharta Karyakram or New India Literacy Programme)—is a centrally sponsored nationwide literacy initiative.
- It moves the traditional focus of adult education away from simple signatures, redefining literacy as functional competence combined with essential life skills.
- Launched In: Formally approved by the Government of India for a five-year implementation span stretching from Financial Year 2022 to 2027.
- Administrative Nodal Agency: Managed directly by the Department of School Education and Literacy (DoSEL) under the Union Ministry of Education.

Aim and Objectives:

- To educate non-literate adults aged 15 years and above who missed out on formal school education.
- Aims to provide Foundational Literacy and Numeracy (FLN) to 5 crore learners over five years (targeting 1 crore learners annually) using a hybrid delivery model.
- To transform adult learning into a civic duty (Kartavya Bodh) driven by community volunteerism, rather than a rigid top-down bureaucratic routine.

Key Features:

- The Redefined Literacy Standard: The standard evaluates their ability to read, write, and compute with clear comprehension, interact with modern digital devices, and understand basic financial calculations.
- School-CentricInfrastructure Units: Utilizes local schools as the primary operational units. Unused spaces in schools, village libraries, or panchayat offices are upgraded into Samajik Chetna Kendras (Social Awareness Centers) to host classes.
- Digital Learning Infrastructure: Registration and progress tracking are managed through the ULLAS Mobile App and Portal. Grains of information are accessible in regional languages through digital channels and the centralized DIKSHA portal.
- Broad Multilingual Core Primers: To make learning accessible, ULLAS instructional textbooks (Primers) are published and distributed in 27 different languages and local dialects.
- The FLNAT Assessment Framework: Foundational Literacy and Numeracy are evaluated twice a year using a scientific testing system called the Foundational Literacy and Numeracy Assessment Test (FLNAT).
- Learners who pass receive a formal literacy certificate jointly signed by the National Institute of Open Schooling (NIOS) and DoSEL.
- Vocational and Social Safety Net Links: To help learners secure local employment, a joint mandate connects successful adult learners with practical trade skills training run through local Jan Shikshan Sansthans (JSS).

States/UTs Achieving 95%+ Literacy under ULLAS:

Sr. No.	State / UT	Year
1.	Ladakh (UT)	2024
2.	Mizoram	2025
3.	Goa	2025
4.	Tripura	2025
5.	Himachal Pradesh	2025

6.	Chandigarh (UT)	2025
7.	Andaman & Nicobar Islands (UT)	2026
8.	Sikkim	2026
9.	Uttarakhand	2026

The Pyre Protest

Context:



The 'Chita Andolan' (Pyre Protest) has resumed in Madhya Pradesh as people affected by the Ken–Betwa Link Project allege delays in rehabilitation, compensation, and resettlement.

The Pyre Protest

AboutThe Pyre Protest:

What It Is?

- The Pyre Protest (Chita Andolan) is a peaceful symbolic protest in which affected people sit beside funeral pyres to express that losing their land, homes, forests, and livelihoods is equivalent to social death.
- Aim: To demand fair rehabilitation, adequate compensation, and timely resettlement for families displaced by major development projects.

Key Features:

- Symbolic Protest: Protesters gather beside funeral pyres with the slogan Provide us justice or death to symbolize extreme distress.
- Tribal-Led Movement: The agitation is led mainly by tribal women affected by the Ken–Betwa Link Project and other irrigation projects.
- Rehabilitation Demands: Protesters allege delays in compensation, housing, rehabilitation packages, and forced demolitions before proper resettlement.
- Environmental Concerns: The movement also raises concerns over forest loss, wildlife impacts (including Panna Tiger Reserve), and ecological damage to the Ken River.

Significance:

- Highlights the importance of balancing infrastructure development with social justice, ensuring rehabilitation and livelihood protection for displaced communities.
- Reinforces the need for participatory development, environmental safeguards, and constitutional protection of tribal rights in development projects.

Crèche Guidelines in India: Rules, Labour Laws, Safety Norms & Childcare Standards

Context:



The severe abuse of toddlers by caregivers at the 'Little Buds Day Care' facility located on the Capgemini campus in Brookefield, Bengaluru, has sparked intense public outrage.

Crèche Guidelines in India

AboutCrèche Guidelines in India: Rules, Labour Laws, Safety Norms & Childcare Standards

What it is?

- A crèche is defined as a specialized care center that provides a safe, protective, and nurturing environment for children while their parents or primary guardians are away at work. The administrative framework aims to standardize early childhood care by providing supplementary nutritious meals, enforcing hygienic conditions, and offering age-appropriate early childhood education activities.

Key Facts:

- Operational Age Limit: Crèches are designed to provide childcare for children aged 6 months and above, supporting working parents during early childhood.
- Expansion under Palna Scheme: The government aims to establish 17,000 Anganwadi-cum-Crèches (AWCCs) under Mission Shakti to expand quality childcare services.
- Women Caregivers Only: National guidelines require only women to be appointed as caregivers and helpers to ensure child safety and comfort.
- Mandatory Crèche Provision: Establishments employing 50 or more workers must provide a crèche facility under labour laws.

Laws & Guidelines Governing Crèches:

National Minimum Standards & Protocol (2024):

- National Standards: Issued by the Ministry of Women & Child Development and Ministry of Labour, these standards prescribe minimum safety and childcare norms for all crèches.
- Location & Infrastructure: Crèches should preferably be on the ground floor, with proper ventilation, secure windows, child-friendly toilets, and continuous water supply.
- Staff Eligibility:Caregivers must have police verification, character and medical fitness certificates, with preference for trained childcare or nursing professionals.
- CCTV Monitoring: All crèches must install CCTV cameras and provide parents with remote access for continuous monitoring of their children.
- Crèche Administrative Committee (CAC): Every facility must form a committee comprising administrators and parent representatives to regularly monitor quality and address concerns.

Labour Law Provisions:

- Code on Social Security & OSHWC Code: Employers with 50 or more workers must establish or arrange a crèche facility within the prescribed distance.
- Nursing Breaks: Working mothers are entitled to four visits per day to the crèche for breastfeeding and childcare, with travel time counted as paid working time.

Key Challenges Associated with Childcare Centers:

- A Critical Lack ofUniform State-Level Adoption: Because the 2024 central protocol is "suggestive," only a small handful of states have turned these guidelines into strict municipal laws, leaving other regions with uneven legal oversight.
- Widespread Corporate Non-Compliance: Trade unions and labor organizations routinely report that thousands of commercial establishments deliberately fail to provide physical crèche assets, exploiting weak enforcement loops to avoid spending capital.
- Weak Background Checks andAutomated Sourcing: Daycare agencies often outsource staffing to unverified private contractors who skip psychological screenings, leading to the recruitment of highly abusive or untrained individuals.
- The Absence of Regular Unannounced Inspections: State social welfare and labor departments rarely conduct independent, surprise physical audits of registered private daycare centers, depending instead on paper compliance.
- A High Variance inEmergency Medical Ties: Many neighborhood crèches and office daycare centers function as isolated setups, failing to maintain active, formal tie-ups with localized pediatric hospitals or first-aid trauma units.

Way Forward:

- Mandating Immediate, State-Enforced CCTV Integration: State labor departments must make it an immediate condition of a business license that all corporate daycares deploy functional CCTV grids, providing real-time, tamper-proof viewing links directly to parents' mobile phones.
- Turning the Central 2024 Protocol into Binding State Law: State assemblies should pass specific amendments to transition the suggestive 2024 central standards into strict, legally binding municipal regulations.
- Conducting Bi-Annual Multi-Department Surprise Audits: Launch joint inspection teams combining

members of the local Police Station, the Child Protection Unit, and the Labour Department to perform unannounced checks on food safety, hygiene, and caregiver behavior.

- Creating aCentralized Public Registry for Certified Caregivers: Establish a digital database tracking certified childcare professionals, ensuring that any worker terminated for ethical violations or abuse is permanently blacklisted.
- Financing Shared Common Crèche Hubs for Small Businesses: Allow clusters of small and medium enterprises (MSMEs) or urban business parks to pool their capital to establish high-quality, shared common crèche systems, backed by partial municipal grants.

Conclusion:

While the 2024 national protocol and modern labor codes provide an excellent structural plan for women-led development, the current ecosystem suffers from weak inspection tracking and widespread corporate avoidance. Ultimately, by turning background verification into a non-negotiable law and opening up real-time CCTV channels for parents, society can ensure that crèches remain safe spaces for children.

SARAS Shakti

Context:

The Ministry of Rural Development launched the SARAS Shakti Collection and the SARAS Shakti Coffee Table Book during the Rashtriya Gramin Vikas Sammelan (RGVS) 2026.

SARAS Shakti

AboutSARAS Shakti:

What It Is?

- SARAS Shakti is a flagship branding and marketing initiative under the Deendayal Antyodaya Yojana–National Rural Livelihoods Mission (DAY-NRLM). It showcases premium products made by women Self-Help Groups (SHGs) to promote rural entrepreneurship and expand market access.

Aim:

- To strengthen women-led rural enterprises through branding, product promotion, and wider market linkages.
- To position SHG products in premium institutional and consumer markets while supporting the vision of Lakhpati Didis and Viksit Bharat.

Key Features:

- Curated Product Collection: Showcases premium handlooms, handicrafts, textiles, wellness products, home décor, and traditional foods made by women SHGs.
- SARAS Shakti Coffee Table Book: Documents the diversity, quality, success stories, and market potential of SHG enterprises across India.
- Market Access Platform: Enhances branding, packaging, digital marketing, and institutional market linkages for rural products.
- Women Enterprise Promotion: Supports over 10 crore women associated with SHGs under DAY-NRLM, encouraging sustainable livelihoods and entrepreneurship.

Significance:

- Strengthens women's entrepreneurship, improves rural incomes, and supports the goal of creating 6 crore Lakhpati Didis by 2029.
- Enhances the visibility of indigenous products, preserving traditional crafts while expanding domestic and institutional markets.

The Centralised IT-Enabled System (CITES) Project

Context:

The Employees' Provident Fund Organisation (EPFO) recently carried out a planned nationwide database consolidation under its Centralised IT-Enabled System (CITES) project.

The Centralised IT-Enabled System (CITES) Project

AboutThe Centralised IT-Enabled System (CITES) Project:

What It Is?

- The Centralised IT-Enabled System (CITES) Project is a sweeping technological and structural modernisation of the EPFO's service delivery architecture. It replaces a legacy, decentralised, and heavily fragmented system with an automated, rule-based processing engine powered by a single, centralized national database.
- Administrative Authority: Managed and deployed by the Employees' Provident Fund Organisation (EPFO), under the Ministry of Labour and Employment, Government of India.
- Core Technical Architect: Designed, built, and engineered by the Centre for Development of Advanced Computing (C-DAC).

Aim:

- To decouple subscribers from specific physical regional offices, allowing any PF field office across India to process any member's request.
- To eliminate persistent technical and procedural delays associated with manual claims, particularly for pension approvals and deceased member settlements.

Key Features of the New System:

- Single Centralized Database Architecture: Consolidated over 120 separate regional databases, migrating several lakh crore historical data records into a single, high-visibility cloud ledger.
- Unified Digital Interface: Subscribers gain access to a streamlined portal using their existing Universal Account Number (UAN) and password, presenting a clear overview of PF accumulations, active claim statuses, and pensionable service records.
- Aggregated Member IDs: Automatically groups all previous and current member IDs under a single UAN anchored securely to a single verified KYC link.
- Interactive Query Resolution: If an issue arises during claim processing, EPFO offices can flag queries electronically. Members review and respond to these prompts online, reducing arbitrary claim rejections and eliminating unnecessary office visits.
- Centralised Pension Payment System: Features an integrated system to disburse monthly pensions smoothly across different regions without requiring local structural transfers.
- UPI Integration Pipeline: The system establishes the underlying data structure required to achieve the EPFO's next-generation goal: linking PF accounts directly with the Unified Payments Interface (UPI) for instant withdrawals.

Chapter-
10

DEFENCE

Nipun: India's Indigenous Diving Support Vessel (DSV)

Context:

Hindustan Shipyard Limited (HSL) formally delivered 'Nipun'—the second indigenous Diving Support Vessel (DSV) built for the Indian Navy—at Visakhapatnam.



Nipun: India's Indigenous Diving Support Vessel

AboutNipun: India's Indigenous Diving Support Vessel (DSV):

What It Is?

- A specialized, first-of-its-kind long-endurance naval vessel designed for deep-sea diving, underwater salvage, submarine rescue, and search-and-rescue (SAR) missions.
- It is Second vessel of the Nistar-class DSVs (following its sister ship, INS Nistar).
- Built By: Designed and constructed by Hindustan Shipyard Limited (HSL) in Visakhapatnam.
- Aim: To strengthen the Indian Navy's underwater strategic capabilities by acting as a specialized platform for deep-sea saturation diving, submarine rescue operations, and oceanographic salvage—reducing dependence on foreign rescue vessels.

Key Features:

- Substantial Scale and Indigenization: Measures 4 meters in length with a displacement of over 8,560 tonnes, featuring an indigenous content exceeding 75%–80% (utilizing steel produced entirely by SAIL).
- Deep-Sea Saturation Diving Capability: Equipped with state-of-the-art diving gear, a side diving stage, moonpool, and saturation diving systems that allow naval divers to operate safely at extreme underwater depths for extended periods.
- Mother Ship for Deep Submergence Rescue Vehicles (DSRV): Serves as a primary host platform to launch, track, and recover the Navy's Deep Submergence Rescue Vehicles (DSRVs) to evacuate personnel during submarine emergencies.
- Remotely Operated Vehicles (ROVs): Fitted with advanced subsea ROVs to monitor divers in real time, conduct underwater structural inspections, and assist in deep-ocean salvage operations.
- High Operational Endurance: Features an operational endurance of 60 days without replenishment and includes a flight deck capable of accommodating heavy helicopters for Search and Rescue (SAR) or medical evacuation missions.

Significance:

- Enables the Indian Navy to conduct rapid, independent submarine rescue operations across the Indo-Pacific without relying on foreign assistance.
- Demonstrates the growing strength of India's defence shipbuilding sector with nearly 80% indigenous content under Aatmanirbhar Bharat.

The Kusha Long-Range Surface-to-Air Missile (LR-SAM)

Context:

The Defence Research and Development Organisation (DRDO) successfully conducted the maiden flight test of the Kusha Long-Range Surface-to-Air Missile (LR-SAM) from Dr APJ Abdul Kalam Island off the coast of Odisha.



LR-SAM

About The Kusha Long-Range Surface-to-Air Missile (LR-SAM):

What It Is?

- Project Kusha is India's indigenously developed, long-range air defence missile system. Often dubbed India's indigenous answer to the Russian S-400 Triumf, it is a fully automated, scalable surface-to-air missile ecosystem designed to detect, track, and destroy enemy aerial threats at standoff distances.

Developing Organisation:

- R&D Lead: Developed by the Defence Research and Development Organisation (DRDO) in partnership with public and private defense industry partners.
- Testing Oversight: Monitored and validated under the Ministry of Defence from the Integrated Test Range (ITR) in Odisha.
- Aim: To build a scalable, multi-layered national air defence shield—aligning with the vision of the integrated "Sudarshan Chakra" national air umbrella—to protect critical civilian and strategic assets while eliminating reliance on foreign air defence imports.

Key Features of Project Kusha:

- Three-Tiered Interceptor Family: Comprises three distinct missile variants tailored for tiered engagement envelopes:
- M1 Variant: Engagement range up to 150 km.
- M2 Variant: Engagement range up to 250 km.
- M3 Variant: Extended engagement range up to 350 km.
- Wide Altitude and Operational Envelope: Designed to neutralize fast-moving targets across various altitudes, spanning low-flying cruise missiles to high-altitude reconnaissance aircraft.
- Fully Integrated Indigenous Subsystems: Includes locally developed active electronically scanned array (AESA) radars, command and control centers, automated battle management software, and high-precision missile seekers.
- High Interception Success Rate: Engineered to perform hit-to-kill and proximity-detonation interceptions against complex electronic target profiles and saturation attacks.

The Kudankulam Data Leak

Context:

Reports emerged that a ransomware syndicate had leaked 14.3 GB of data containing 18,997 files explicitly linked to the Kudankulam Nuclear Power Plant (KKNPP) on the dark web.



The Kudankulam Data Leak

About The Kudankulam Data Leak:

What it is?

- The Kudankulam data leak involves the unauthorized exfiltration and online publication of non-classified structural and administrative files associated with Units 3 and 4 of India's largest nuclear power facility. The leaked data does not contain core operational reactor software or safety systems.

How the Cyber Incident Happened?

- The Indirect Contractor Vulnerability: Attackers did not breach the state-owned NPCIL's air-gapped core military infrastructure. The leak originated via an infiltration into the network of Reliance Infrastructure Ltd, which was awarded a $112 million secondary engineering and construction contract for common utilities in 2018.
- Third-Party Cloud Compromise: The targeted data was stored on a commercial server hosted by Yotta Data Services Private Limited, a prominent third-party Indian data center provider managing the contractor's private cloud network.

- The EndpointSecurity Trigger: Yotta's endpoint detection software flagged suspicious malware execution on a single file server. Technicians isolated the target asset, believing they had terminated the threat before active data encryption took place.
- The Ransomware Syndicate Release: Despite containment efforts, threat actors from the cybercriminal syndicate World Leaks successfully scraped data before server isolation. When their subsequent extortion demands were ignored by the contractor, they published the 14.3 GB subset as part of a massive 1.2 TB multi-company data dump.

Measures in Place in India to Prevent Data Leaks

- National Incident Coordination: The Indian Computer Emergency Response Team (CERT-In) operates as the national nodal agency for cyber threat tracking, vulnerability mitigation, and rapid emergency response across critical commercial and government grids.
- Strict Sectoral Air-Gapping Mandatory Directives: Strategic state installations—particularly the automated industrial control networks managing nuclear reactors and ISRO telemetry lines—are completely isolated from the standard public internet and office administrative networks.
- Thee-Governance Cybersecurity Guidelines: The National Cyber Coordination Centre (NCCC) works continuously alongside intelligence frameworks to ingest threat warnings from international allies, proactively blocking actors targeting primary domain controllers.
- Techno-Legal Privacy Obligations: Cyber operations must adhere to data security benchmarks under the Information Technology Act, 2000, and the Digital Personal Data Protection (DPDP) Act, which require companies to deploy robust technical controls to insulate private data.

Key Challenges Associated withCritical Infrastructure Leaks

- The Security Flaw of the Supply Chain: While central governments heavily secure their primary assets, secondary private vendors and sub-contractors often have weaker technical protections, creating an ideal backdoor entry point for hackers.
- Facilitating Reconnaissance Mapping: Even though conventional infrastructure details seem minor, exposing detailed layout plans, cooling paths, and vendor files gives hostile actors a map to plan targeted physical or digital sabotage.
- Persistent Advanced Transnational Actors: Critical national assets are prime targets for continuous state-backed espionage syndicates—such as the 2019 DTrack malware incident linked to North Korean actors—that focus on technology theft.
- The Proliferation of Triple-Extortion Models: Modern cybercriminals no longer just encrypt servers; they steal data, demand ransom, and leak files on the dark web, making traditional data backup systems insufficient against public exposure.

Way Forward

- Mandating Zero-Trust Architecture for Supply Partners: Force all secondary private engineering contractors handling public infrastructure blueprints to undergo the same rigorous, continuous security checks required for primary ministries.
- Enforcing Document Redaction andDynamic Watermarking: Ensure that technical specifications shared during public tenders are dynamically watermarked, scrambled, and stripped of exact geographical locations to prevent systemic facility mapping if leaked.
- Deploying Automated Continuous Threat Hunting: Upgrade the threat-hunting capabilities of CERT-In and private data centers to actively search for hidden, long-term malware before it can copy data.
- Standardizing Incident Reporting Mandates: Enforce strict legal penalties under the DPDP Act for companies that fail to immediately report data breaches to the central government, cutting down on communication gaps between private firms and public security teams.

Conclusion

While the core reactor software remains secure inside its air-gapped system, the exposure of 14.3 GB of building blueprints highlights a serious vulnerability in supply chain cybersecurity. Moving forward, India must look past simple network isolation to enforce strict, uniform cybersecurity standards across all private partners to protect strategic state assets from global cybercrime syndicates.

China's J-20 Fighter

Context:



While global attention focuses on China's emerging sixth-generation fighter designs, the Chengdu J-20 Mighty Dragon has quietly matured into the absolute backbone of the People's Liberation Army Air Force (PLAAF).

China's J-20 Fighter

AboutChina's J-20 Fighter:

What It Is?

- The Chengdu J-20 (Mighty Dragon) is a twin-engine, fifth-generation stealth fighter designed for air superiority and precision strike missions. It is China's first indigenously developed operational stealth aircraft.

Developed By:

- Developed by the Chengdu Aircraft Corporation (CAC) for the People's Liberation Army Air Force (PLAAF) under the J-XX programme.
- First flight: 2011 | Entered service: 2017.

Key Features:

- Stealth & Agility: Uses a canard-delta design, stealth shaping, and diverterless supersonic intakes (DSI) for high manoeuvrability and low radar visibility.
- Advanced Sensor Fusion: Integrates AESA radar, Electro-Optical Targeting System (EOTS), Distributed Aperture System (DAS), and a digital cockpit for enhanced situational awareness.
- Indigenous Engines: Powered by WS-10C and newer WS-15 engines, enabling improved performance and supercruise capability.
- Flexible Combat Roles: Can operate in stealth mode with internal weapons or Beast Mode with external missiles for greater firepower.
- Manned-Unmanned Teaming: The twin-seat J-20S can coordinate electronic warfare and control loyal wingman drones.

Strategic Significance:

- Strengthens China's Air Dominance: Large-scale production is rapidly modernising the PLAAF and expanding China's fifth-generation fighter fleet.
- Enhances Indo-Pacific Power Projection: The J-20 improves China's ability to challenge rival air forces by targeting high-value assets and supporting operations in the Taiwan Strait and South China Sea.

The Anti-Submarine Warfare Craft 'Malvan'

Context:



The Indian Navy is set to commission its second indigenous Mahe-class Anti-Submarine Warfare Shallow Water Craft (ASW-SWC), named Malvan.

The Anti-Submarine Warfare Craft 'Malvan'

AboutThe Anti-Submarine Warfare Craft 'Malvan':

What It Is?

- Malvan is a specialized, new-generation Anti-Submarine Warfare Shallow Water Craft (ASW-SWC) engineered specifically to conduct sub-surface combat operations. Described by the Indian Navy as a compact, yet formidable shallow-water warrior, the vessel is built to perform agile, high-precision defensive and offensive sweeps in littoral or shallow coastal areas.

- Built By: The warship was entirely constructed and integrated by Cochin Shipyard Limited (CSL) in Kochi, Kerala.
- Aim: The central objective of deploying the Malvan is to strengthen India's coastal security matrix by detecting, tracking, and neutralizing hostile submarines, underwater drones, and sub-surface intruders operating close to the coastline, ports, and critical island territories.

Key Features of the Vessel:

- High Indigenous Content: Over 80% indigenous content, showcasing India's self-reliance in warship design, construction, and combat systems.
- Shallow-Water Optimisation: Designed to operate effectively in coastal and shallow waters, where larger warships have limited access.
- Compact & Agile Design: Lightweight hull provides high speed, fuel efficiency, and quick response to underwater threats.
- AdvancedAnti-Submarine Sensors: Equipped with hull-mounted and towed array sonars for detecting and tracking submarines.
- Powerful Weapon Systems: Armed with lightweight torpedoes, anti-submarine rocket launchers, and mine-laying capability.

Strategic Significance:

- Strengthens Coastal Defence: Enhances India's ability to detect and counter enemy submarines and underwater drones in coastal waters.
- Protects Maritime Assets: Safeguards ports, EEZs, offshore energy assets, and shipping lanes, allowing larger warships to focus on blue-water operations.
- BoostsIndigenous Shipbuilding: Demonstrates India's growing capability to build advanced warships domestically while supporting defence exports and supply chain resilience.

Exercise Pitch Black 2026

Context:

An Indian Air Force (IAF) contingent—comprising four Rafale fighter jets, two C-17 Globemaster III transport aircraft, and over 120 Air Warriors—has arrived in Australia to participate in Exercise Pitch Black 2026.



Exercise Pitch Black 2026

AboutExercise Pitch Black 2026:

What It Is?

- Exercise Pitch Black is a large-scale, premier biennial warfare drill focused on complex, high-end multinational air combat training. It acts as one of the Indo-Pacific region's largest collective air defense and strike simulation exercises.
- Host: The military drill is hosted by the Royal Australian Air Force (RAAF).

Participants:

- The 2026 edition features active forces and military personnel from 20 nations.
- Core participants deploying aircraft include the United States, Japan, India, Indonesia, Singapore, France, Germany, Spain, South Korea, Thailand, the Philippines, Papua New Guinea, and host Australia, alongside embedded personnel from nations like the UK, Canada, and New Zealand.

Key Features of the Exercise:

- Three-Week Operational Timeline: The exercise runs from July 20 to August 7, 2026, marking the conclusion of a high-tempo training block in northern Australia.
- Massive Fleet Outlay: Features up to 100 fighter and support aircraft alongside more than 2,500 military personnel executing complex, realistic air combat scenarios.
- Strategic Tri-Base Operations: Flight maneuvers are launched concurrently from three key RAAF bases: Darwin, Tindal, and Amberley.

- Next-Generation Technical Debuts: The 2026 edition marks the first-ever participation of Japan's F-35 Lightning II stealth fighters and Indonesia's T-50I Golden Eagle jets in this collective drill.
- Realistic Large-Force Employment (LFE): Forces divide into simulated Red Air (aggressor forces) and Blue Air (coalition forces) to practice day-and-night air combat, tactical bombing, and aerial refueling maneuvers.

Strategic Significance:

- Strengthens coordination among participating air forces through common communication systems, joint operations, and aerial refuelling practices.
- Reinforces a free, open, and stable Indo-Pacific by improving collective deterrence and regional security cooperation among partner nations.

Operation Southern Readiness 26-2

Context:

The Ministry of Defence announced that the Indian Navy will host Operation Southern Readiness 26-2, a four-day multinational maritime security training engagement, in Kochi

Operation Southern Readiness 26-2

AboutOperation Southern Readiness 26-2:

What It Is?

- Operation Southern Readiness 26-2 is a high-level, multi-domain international maritime security training engagement. Rather than standard combat maneuvers, this event seamlessly blends rigorous classroom instruction, realistic simulator-based scenarios, and actual hands-on sea deployment to uniform tactical skills across global partner navies.
- Host: The training initiative is being hosted by the Indian Navy at the Southern Naval Command (SNC) in Kochi, Kerala.
- Participant Members: The drill is conducted in close partnership with the Combined Maritime Forces (CMF)—a premier, global maritime coalition comprising more than 40 member nations.

Key Features of the Training Engagement:

- IntegratedTask Force Oversight: Orchestrated by the Indian Navy-led CTF 154, the module coordinates maritime security specialists from across the CMF's 40+ country alliance to exchange operational best practices.
- Tackling Modern Asymmetric Threats: Specialized educational sessions will comprehensively focus on navigating complex Maritime Law, Counter-Narcotics operations, Force Protection, and neutralizing asymmetric threats.
- Frontier Uncrewed Technology Focus: Includes customized modules dedicated to Maritime Uncrewed Systems (drones and UUVs), optimizing how partner nations track threat footprints using automated technology.
- State-of-the-Art Simulator Drills: Leverages the Southern Naval Command's modern training infrastructure, utilizing state-of-the-art simulators for highly immersive navigation and tactical coordination training.
- Live Practical Boarding and Survival Exposure: Participants will undergo live operational training on Indian Naval warships, covering high-risk Boarding procedures, Damage Control, Firefighting, and Survival at Sea protocols.

Significance:

- Showcases the Indian Navy's advanced training infrastructure, enhancing its role as a global hub for maritime capacity building.
- Improves coordination, information sharing, and joint operations among partner navies to counter piracy, smuggling, and maritime security threats.

The Astra Mk 1 Missile

Context:



During the bilateral summit in Jakarta, India and Indonesia signed a landmark defense deal for the supply of the indigenous Astra Mk 1 air-to-air missiles.

The Astra Mk 1 Missile

AboutThe Astra Mk 1 Missile:

What It Is?

- The Astra Mk 1 is an advanced, all-weather Beyond-Visual-Range Air-to-Air Missile (BVRAAM). Capable of engaging and destroying highly agile supersonic aerial targets at long distances, it belongs to an elite category of interceptors designed to clear the skies before an adversary can close in for visual dogfighting.
- Developed By: Defence Research and Development Organisation (DRDO), with Bharat Dynamics Limited (BDL).
- Objective: The objective of the Astra missile system is to provide fighter pilots with long-range stand-off strike superiority.

Key Technical Features and Variants:

- High-Speed Interception: Reaches a top speed of Mach 4.5 (four and a half times the speed of sound), allowing it to quickly chase down and destroy fast-moving, maneuvering targets.
- Operational Envelope: Operates at altitudes ranging from sea level up to 20 km, with an effective engagement range spanning from 80 km to 110 km for the baseline Mk 1 variant.

Three-Phase Guidance System:

- Initial Phase: Navigates using pre-programmed internal data systems immediately after release.
- Mid-Course Phase: Receives continuous radio data updates from the launch aircraft to adjust its flight path as the target moves.
- Terminal Phase: Activates its built-in Radio Frequency (RF) seeker to lock onto and track the target autonomously, ignoring enemy electronic jamming.
- Smokeless Solid Propulsion: Powered by a single-pulse, smokeless solid-fuel rocket motor that leaves no visible vapor trail, keeping the launch aircraft's position hidden from enemy sensors.
- Cross-Platform Integration: Fully operational on the Sukhoi Su-30 MKI fleet, with ongoing integration projects to adapt the missile for India's indigenous LCA Tejas Mk 1A and French-designed Rafale jets.

The Astra Family Evolution:

- Astra Mk 2: Features an extended range of 200 km, powered by a dual-pulse solid rocket motor that can reignite during its final approach, leaving targets with no space to escape.
- Astra Mk 3 (Gandiva): Currently under development by DRDO, this longest-range variant utilizes Solid Fuel Ducted Ramjet (SFDR) technology to sustain constant propulsion mid-flight, aiming for an intercept range exceeding 350 km.

The BrahMos Missile

Context:



Expanding India's defense export footprint, Indonesia has signed a Memorandum of Understanding (MoU) with BrahMos Aerospace for a phased procurement of two coastal missile batteries estimated at $200 million.

The BrahMos Missile

AboutThe BrahMos Missile:

What It Is?

- BrahMos is a medium-range, universal supersonic cruise missile that operates on a distinct "Fire and Forget"

Flying at a blistering speed of Mach 2.8, it holds the title of the fastest operational cruise missile in the world and is the only supersonic cruise missile available for export globally.

Developed By:

- The missile is manufactured by BrahMos Aerospace, a highly successful joint venture established in 1998 between:
- India: Defence Research and Development Organisation (DRDO), holding a 50.5% majority stake.
- Russia: NPO Mashinostroyeniya, holding a 49.5% stake.
- The Regulatory: Because of this joint venture architecture, Moscow retains a veto and must explicitly concur on every third-country sale.
- Aim: The objective of the BrahMos weapon system is to provide cross-platform, long-range precision strike capabilities against heavily defended land and maritime targets.
- Global Export from India: The Philippines, Vietnam and Indonesia.

Key Technical Features:

- Two-Stage Propulsion System:BrahMos uses a solid-fuel booster for rapid launch and acceleration, followed by a liquid-fuel ramjet engine that sustains supersonic cruise speed of Mach 2.8.
- True Multi-Platform Universality:The missile can be launched from land, warships, submarines, and Su-30MKI aircraft, giving all three Indian Armed Forces a common precision-strike weapon.
- Advanced Sea-Skimming Architecture:BrahMos cruises at high altitude but descends to as low as 5 metres above sea level near the target, making radar detection extremely difficult.
- MassiveKinetic Impact Lethality: Carrying a 200 kg warhead at Mach 2.8, BrahMos delivers enormous kinetic energy capable of destroying heavily fortified military targets.
- MTCR Range Boundaries:Export versions are limited to 290 km under MTCR norms, while India deploys extended-range variants exceeding 450 km for domestic use.
- CanisterizedStorage Infrastructure: The missile is stored and launched from a sealed Transport Launch Canister (TLC), ensuring long shelf life, quick deployment, and minimal maintenance.

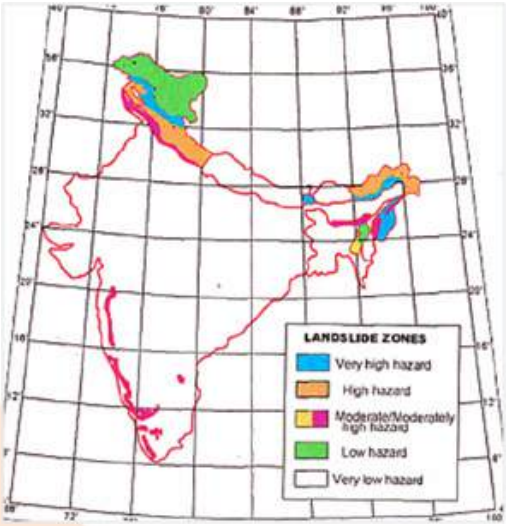
EXCEL CIVILS ACADEMY EMPOWERING FUTURE LEADERS

11 DISASTER

Landslide

Context:

Torrential monsoon downpours and severe landslides struck Maharashtra, forcing the closure of major transit routes including the Mumbai-Pune Expressway and the Mumbai-Goa Highway.



Landslides

AboutLandslides:

What it is?

- A landslide refers to the rapid downward and outward movement of slope-forming materials—such as rocks, soil, organic matter, and artificial fill—under the direct influence of gravity. These mass wasting events occur when the shear stress acting on a slope exceeds the shear strength of the underlying soil or rock layers.

Key Data & Statistics on Landslides in India:

- Landslide-Prone Area: Around 15% of India's land area (about 0.42 million sq km) is vulnerable to landslides.
- Major Hotspots: High-risk regions include the Himalayas, Northeast India, Western Ghats, and Eastern Ghats due to fragile terrain.
- Seismic Risk: Many landslide-prone areas fall within Seismic Zones IV and V, where earthquakes further increase slope instability.

Factors Causing Landslides in India:

- Intense and Prolonged Rainfall Precipitation: Heavy downpours rapidly increase groundwater pore pressure, adding weight to unstable slopes and weakening soil cohesion.
- Example: The severe July 2026 monsoon system completely saturated hill slopes along the Khopoli-Kusgaon 'Missing Link' corridor, triggering sudden boulder falls.
- Unscientific Hill Cutting forLinear Infrastructure: Carving steep vertical cuts into hillsides for highways or rail links without engineering slope reinforcements destabilizes the natural slope equilibrium.
- Example: Rapid transport widening projects in the ecologically sensitive Konkan region regularly trigger debris failures during rainy seasons.
- Deforestation and Loss ofVegetative Root Anchors: Removing deep tree roots leaves topsoil exposed to intense sheet erosion and rain impact.
- Example: Extensive vegetation clearance for commercial properties on the steep slopes of Mussoorie has left the local soil vulnerable to sliding.
- Tectonic Activity and Fractured Rock Stratigraphy: Constant crustal movements fracture mountain rocks, creating active planes of weakness that slide easily.
- Example: The young, tectorially active Himalayan belts of Uttarakhand experience massive rockslides even under minor rainfall or seismic triggers.

Key Challenges inLandslide Risk Management:

- Remote and Inaccessible Terrains for Emergency Units: Many vulnerable settlements are located in rugged hinterlands, making it difficult for rescue teams to reach them quickly.
- Example: Landslides in Pune's Mawal taluka required specialized heavy gear from the 5th Battalion of the NDRF to reach the remote village of Patan.

- Severe Weather Impeding Air and Surface Logistics: Heavy rain and thick cloud cover during disasters block air support and endanger surface search operations.
- Example: Debris clearance on the Mumbai-Goa Highway near Chiplun was delayed for hours because continuous rains triggered secondary rockfalls.
- Weak Regional Enforcement ofLand-Use Zoning Regulations: Local municipal bodies often fail to enforce building bans on designated high-risk slopes, leading to unsafe construction.
- A Shortage of Meso-Scale Real-Time Early Warning Systems: Most regions lack localized ground sensors to detect initial soil movements, making it difficult to issue early evacuation notices.

National Disaster Management Authority (NDMA) Guidelines:

- The NDMA's national guidelines outline a comprehensive mix of structural and non-structural practices to manage landslide risks:
- Compiling Comprehensive Landslide Inventories: Tasking the Geological Survey of India (GSI) to map and maintain updated databases of national landslide incidents.
- Executing Macro andMeso-Scale Hazard Mapping: Creating detailed Landslide Hazard Zonation (LHZ) maps at scales of 1:50,000 and 1:10,000 to identify high-risk zones and guide safe infrastructure planning.
- Implementing Structural Slope Stabilization Engineering: Mandating the use of retaining walls, rock bolting, wire mesh netting, and anchoring systems to secure unstable slopes along roads and critical structures.
- Prioritizing Surface and Sub-SurfaceDrainage Management: Developing dedicated channel networks to safely route stormwater away from fragile slopes, keeping pore water pressures within safe limits.

Way Forward:

- Deploying AI-Powered Early Warning Systems: Install automated ground sensors, extensometers, and smart rain gauges along key transport lines like the Mumbai-Pune Expressway to broadcast real-time evacuation alerts.
- Mandating Netting and Rock-Catch Barriers: Construct heavy steel catch-fences and rockfall shelters above vulnerable sections of major highways to shield passing vehicles from falling stones.
- Integrating High-Resolution Drone Mapping Updates: Use LiDAR and drone imagery to audit vulnerable slopes bi-annually, allowing engineering teams to identify new ground cracks before the monsoon arrives.
- Enforcing Strict Bans on Unscientific Slope Cutting: State transport departments must avoid unscientific road widening, mandating instead terraced benching and geo-textile soil reinforcement on all hill projects.
- Strengthening Community-Led Emergency Response Teams: Train local village volunteers in remote talukas in early rescue, emergency communication, and first-aid protocols to ensure immediate support before state teams arrive.

Conclusion:

While agencies like the GSI and NDRF provide valuable mapping and emergency support, recurring highway closures and tragic housing collapses highlight the cost of weak local enforcement and unplanned hill development. Moving forward, transforming NDMA's hazard guidelines into binding municipal codes and deploying automated early warning networks will remain vital to protect public safety and secure the nation's transit corridors.



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