

OFFICERS IAS ACADEMY™

OFFICERS' PULSE



August 2025 (Digest)

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MONTHLY

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CONTENTS

1.POLITY.....1	
1.1 Nominations to (UT)Assemblies.....1	
1.2 Overseas Citizen of India (OCI) Scheme.....1	
1.3 Machine-Readable Electoral Rolls.....2	
2. ECONOMY.....3	
2.1 Overhaul of GSTsystem.....3	
2.2 Income-tax Act, 2025.....4	
2.3 System of National Accounts 2025 (SNA 2025).....4	
2.4 FAO Food Price Index (FFPI)..5	
2.5 RBI directive on consolidating core banking functions.....5	
2.6 India's Rating Upgrade by S&P.....6	
2.7 Centre for Processing Accelerated Corporate Exit (C-PACE).....6	
2.8 Regulated Venue for Pre-Listing Companies.....7	
2.9 Advance Authorisation Scheme.....7	
2.10 Export Promotion Mission..8	
IMPORTANT CONCEPTS IN NEWS.....8	
2.11 Forex Swap Auction.....8	
2.12 Variable Reverse Repo Rate (VRRR).....9	
2.13 Variable Repo Rate (VRR)....9	
2.14 Overnight Call Rate.....9	
2.15 TREPS Rate (<i>Tri-Party Repo</i>).....9	
2.16 Cheque Truncation System (CTS).....9	
3. GEOGRAPHY.....10	
3.1 Mud Waves buried beneath the Atlantic seabed.....10	
3.2 Nickel-Copper-Platinum Group Elements (Ni-Cu-PGE)...10	
3.3 Cloudburst.....11	
3.4 C-Flood.....11	
4.ENVIRONMENT.....12	
4.1 Kyoto Protocol.....12	
4.2 Joint Crediting Mechanism (JCM).....12	
4.3 National Designated Authority (NDA).....13	
4.4 Geogenic (Natural) Sources of Water Contamination.....13	
4.5 Air Quality Life Index (AQLI).....14	
4.6 Ethanol Blending Issues.....14	
4.7 Sustainable Aviation Fuel (SAF).....15	
4.8 Tri-structural Isotropic (TRISO) Particle Fuel.....15	
4.9 Critical Tiger Habitat (CTH).....16	
4.10 The Sundarbans.....16	
4.11 Dibru-Saikhowa National Park (DSNP).....16	
4.12 Vantara Zoo.....17	
4.13 Mines and Minerals (Development and Regulation) Amendment Bill, 2025.....17	
SPECIES IN NEWS.....18	
4.14 Mouse Deer / Chevrotain..18	
4.15 Arctic Reindeer.....18	
4.16 Sunflower seastar (<i>Pycnopodia helianthoides</i>).....19	
4.17 Jellyfish.....19	
4.18 <i>Botryococcus braunii</i>20	
5.AGRICULTURE.....21	
5.1 Specialized fertilizers vs commodity fertilizers.....21	

5.2 Digital Agriculture Mission.....	21	6.16 National Deep Water Exploration Mission.....	32
5.3 Seed Traceability, Authentication, and Holistic Inventory (SATHI).....	22	6.17 UPI 3.0 with NFC and Wearables.....	32
5.4 Fortified Rice Scheme.....	23	SPACE	33
5.5 Pradhan Mantri Krishi Sinchayee Yojna (PMKSY).....	24	6.18 Gaganyaan.....	33
5.6 Jute.....	24	6.19 Himalayan Outpost for Planetary Exploration (HOPE)..	33
5.7 Apricot (<i>Prunus armeniaca</i>).....	24	6.20 Mira Variable Stars.....	33
5.8 National Cooperative Exports Limited (NCEL).....	25	6.21 UPM J1040–3551 AabBab..	33
5.9 Viksit Krishi Sankalp Abhiyan.....	25	7. DEFENCE.....	35
6.SCIENCE AND TECHONOLOGY.....	26	7.1 MiG-21.....	35
HEALTH.....	26	7.2 Akashteer: Air Defence Control and Reporting System (ADCRS).....	35
6.1 Rabies.....	26	7.3 Integrated Air Defence Weapon System (IADWS).....	36
6.2 Brain-Eating Amoeba.....	26	7.4 Golden Dome Missile Defence System.....	37
6.3 Human African trypanosomiasis (sleeping sickness)	26	7.5 Project 17A (P17A).....	37
6.4 Rubella.....	27	ARMED FORCES.....	38
6.5 Hepatitis D Virus (HDV).....	27	7.6 Bhairav Commando Battalions.....	38
6.6 Nanocarrier-based treatment for advanced liver cirrhosis.....	27	7.7 Sarvottam Yudh Seva Medals (SYSM).....	38
6.7 Polyvalent Antivenom.....	28	JOINT EXERCISES/DRILLS.....	39
6.8 Notch signalling.....	28	7.8 Indian Ocean Naval Symposium(IONS).....	39
6.9 Trastuzumab.....	28	7.9 Exercise Bright Star 2025..	40
6.10 Zaynich (WCK 5222).....	28	7.10 SLINEX-25.....	40
6.11 Bioactive Peptides (BAPs) or short protein fragments.....	29	8. INTERNATIONAL RELATIONS.....	41
INNOVATIONS.....	29	8.1 Shanghai Cooperation Organization (SCO).....	41
6.12 Escherichia coli turned into Mercury Sensor.....	29	8.2 Bay of Bengal Initiative for Multi-sectoral Technical and Economic Cooperation (BIMSTEC).....	41
6.13 Isotopic Exchange Reaction.....	30	8.3 Eurasian Economic Union (EAEU).....	42
6.14 Strategic Interventions for Green Hydrogen Transition (SIGHT) Scheme.....	30	8.4 UN Famine Declaration.....	42
6.15 Deep Ocean Mission.....	31		

8.5 United Nations High Commissioner for Refugees (UNHCR).....	43	9.12 Unified District Information System for Education Plus (UDISE+).....	51
8.6 International Regulatory Cooperation for Herbal Medicines (IRCH).....	43	9.13 THE NARI 2025: National Annual Report and Index on Women's Safety.....	51
PLACES IN THE NEWS.....	44	9.14 Climate Change and Workplace Heat Stress Report.....	52
8.7 Nagorno-Karabakh.....	44	9.15 SHRESTH (State Health Regulatory Excellence Index)....	52
8.8 East China Sea.....	44	9.16 Framework for Responsible and Ethical Enablement of Artificial Intelligence (FREE-AI) in the financial sector.....	52
8.9 Israel E1 settlement.....	45	9.17 State Energy Efficiency Index (SEEI)2024.....	52
8.10 Tato Hydroelectric Projects.....	45	9.18 India Electric Mobility Index.....	53
8.11 Daulat Beg Oldie.....	45	9.20 Global Artificial Intelligence (AI) City Index 2025.....	53
9. GOVERNMENT SCHEMES AND PROGRAMMES.....	46	IMPORTANT LEGISLATIONS.....	54
9.1 Pradhan Mantri Matru Vandana.....	46	9.21 National Sports Governance Act, 2025.....	54
9.2 UNNATI (Upgrading Norms for Nutrition, Growth, and Development Assessment of Indian Children).....	46	9.21 The Promotion and Regulation of Online Gaming Act,2025.....	54
9.3 Pradhan Mantri National Dialysis Programme (PMNDP).47		9.22 National Anti-Doping (Amendment) Act, 2025.....	55
9.4 Adi Karmayogi initiative....	47	9.23 Coastal Shipping Act, 2025.....	55
9.5 Pradhan Mantri Janjatiya Unnat Gram Abhiyan(PM JUGA).....	47	DOMESTIC BODIES/INSTITUTIONS IN NEWS.....	56
9.6 Atal Innovation Mission 2.0(AIM2.0).....	48	9.24 Central Consumer Protection Authority (CCPA).....	56
9.7 PM eDrive.....	48	9.25 National Institute of Animal Biotechnology (NIAB).....	56
9.8 Vibrant Villages Programme (VVP).....	49	9.26 Higher Education Commission of India (HECI).....	57
9.9 JATAN scheme.....	49	10. MISCELLANEOUS.....	58
9.10 One Nation, One Subscription (ONOS) Scheme....	50		
9.11 Swachh Shehar Jodi (SSJ) guidelines: "Each One, Teach One" approach.....	50		
IMPORTANT REPORTS AND INDICES.....	51		

10.1 Great Nicobar Project.....	58
10.2 Toda Tribe.....	59
10.3 Census 2027.....	59
10.4 Registration of Births & Deaths.....	60
10.4 Daruma Doll.....	60

1. POLITY

1.1 Nominations to (UT) Assemblies

Why in News?

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

About

Nomination refers to the appointment (not election) of members to legislatures to ensure representation of special communities, migrants, women, or experts in fields such as literature, science, arts, and social service.

Constitutional & Statutory Basis

- **Lok Sabha / State Assemblies:** Anglo-Indian nomination under Articles 331 & 333 was discontinued by the 104th Constitutional Amendment (2020).
- **Rajya Sabha (Art. 80):** President nominates 12 members of expertise in art, literature, science, and social service.
- **State Legislative Councils (Art. 171):** 1/6th members are nominated by the Governor.
- **Union Territories:** Governed by Parliamentary laws (not direct constitutional provisions) as UTs are under Union administration.

UT-specific Provisions

- **Jammu & Kashmir (J&K Reorganisation Act, 2023):** Lieutenant Governor may nominate 5 members – 2 women, 2 Kashmiri migrants, 1 displaced person from PoK (Pakistan occupied Kashmir).
- **Puducherry (Government of UT Act, 1963):** Centre may nominate up to 3 members.
- **Delhi (GNCTD Act, 1991):** No provision for nominated MLAs.

Judicial Stand

- **K. Lakshminarayanan v. Union of India (2018, Madras HC):** Upheld Centre's power to nominate MLAs in Puducherry, holding that UT government's advice is not binding.

1.2 Overseas Citizen of India (OCI) Scheme

Why in news?

- Ministry of Home Affairs amended **Citizenship Act Rules** to allow cancellation of OCI registration if the cardholder:
 - Is convicted for **two years or more**, or
 - Is **charge-sheeted** for an offence punishable with **seven years or more**,
 - Applicable **regardless of where the offence occurred** (India or abroad).

About

- Launched: **2005**, under provisions of the **Citizenship (Amendment) Act, 2005**.
- Objective: Provide long-term residency and travel benefits to **foreign nationals of Indian origin** | Nodal Ministry: **Ministry of Home Affairs (MHA)**.

Key Features:

- **Multiple-entry, lifelong visa** for visiting India.

- Exemption from registration with **FRRRO (Foreigners Regional Registration Office)** for any length of stay.
- Right to own property (except **agricultural or plantation land**).
- Can pursue education, employment, and investment opportunities in India.
- Treated at par with NRIs in economic, financial, and educational fields (except acquisition of agricultural land).

Restrictions / Not Granted Rights

- No political rights → **cannot vote**, contest elections, or hold constitutional posts.
- Cannot hold government jobs (except in certain contractual categories with prior approval).

Grounds for Cancellation (Existing + New)

- **Fraud or concealment** in obtaining OCI.
- **Disaffection towards the Constitution of India.**
- Engaging in unlawful trade/communication with the **enemy during war**.
- Acts **against sovereignty, integrity, security of India**, friendly relations with foreign states, or against public interest.
- **New (2025 Amendment):** Conviction \geq 2 years, or charge-sheet for offences punishable with \geq 7 years imprisonment.

OCI vs. PIO (merged in 2015)

- The **OCI(Overseas Citizenship of India) and PIO(Person of Indian Origin) card schemes were merged in 2015** (Citizenship Amendment Rules, 2015).
- All valid PIO cards are now deemed OCI cards.

1.3 Machine-Readable Electoral Rolls

Why in the news?

Opposition parties have urged the Election Commission (EC) to make electoral rolls available in machine-readable formats. They argue that easily searchable rolls are essential for identifying duplicate or fraudulent voter entries.

About

Machine-readable electoral rolls refer to voter lists released in a **text-searchable format** rather than as image-only PDFs. Unlike image-based files, these searchable versions allow quick scanning, data analysis, and cross-verification.

- **Image-only PDFs are cumbersome for scrutiny** since they cannot be directly searched.
- Making them usable **requires Optical Character Recognition (OCR) software**, which is both resource-heavy and costly.
- Text-based lists, on the other hand, simplify automated checks for duplication and enable large-scale, accurate data verification.

Why did the Election Commission discontinue machine-readable rolls?

Following the **Kamal Nath v. Election Commission case** in 2018, the Supreme Court declined to mandate the release of text-based electoral rolls. Soon after, the EC issued an internal directive instructing states to upload only image-PDF formats.

The decision was guided by **privacy and security concerns**:

- Names, addresses, and other voter details in text-searchable form could be **exploited by external entities**.
- Easy access to searchable voter data increases the risk of profiling, mass surveillance, and targeted political manipulation.

2. ECONOMY

2.1 Overhaul of GST system

Why in the news?

The PM had announced GST2.0 as a gift for the Indian populace. The Goods and Services Tax (GST) Council approved the above major overhaul of the tax structure in its 56th meeting.

About

To boost domestic consumption, simplify the tax system and facilitate ease of doing business (streamline compliance and reduce litigation), the Goods and Services Tax (GST) Council approved the below-mentioned major overhaul of the GST tax structure in its 56th meeting.

Simplified tax rate structure: from a four-slab system to a two-tier structure

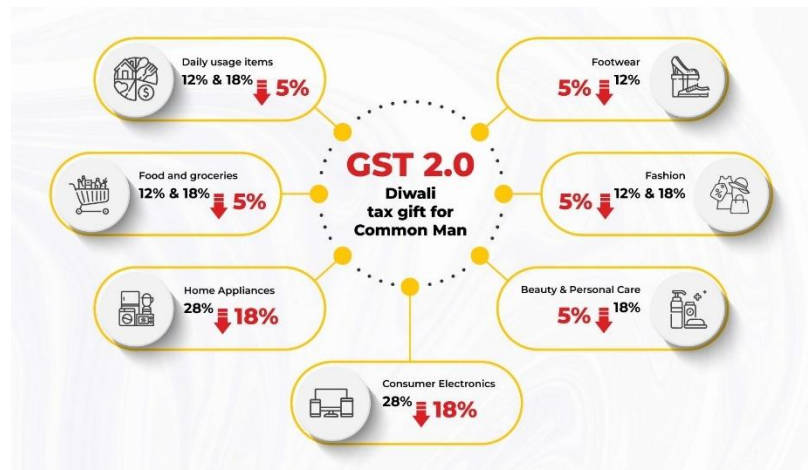
- 5% (Merit Rate): For essential commodities and processed food products.
- 18% (Standard Rate): For most other goods and services, merging the previous 12% and 28% slabs.
- 40% (Demerit Rate): For luxury and sin goods, such as high-end cars, aerated beverages, and tobacco products.

Key rate increases

- The rate for coal, lignite, and peat has been raised from 5% to 18%.

Key rate reductions and exemptions

- Zero tax (Nil):
 - **33 lifesaving medicines** and all individual health and life insurance policies are now exempt from GST.
 - Items like Ultra-High Temperature (UHT) milk, pre-packaged paneer, pizza bread, chapati, and roti are now tax-free.
 - **School supplies**, including exercise books, notebooks, pencils, and erasers, will no longer be taxed.
- Reduced to 5%:
 - **Processed Foods:** A wide array of packaged foods, including namkeens, chocolates, coffee, and pasta, now fall into this lower slab.
 - **Agriculture:** Tax on equipment like tractors, tyres, sprinklers, and bio-pesticides is reduced.
 - **Labour-intensive products:** Handcrafted items, marble blocks, and intermediate leather goods have a lower GST rate.
- Reduced to 18%:
 - GST on small cars and motorcycles up to 350cc.
 - Air conditioners and television sets.
 - The rate on cement is reduced from 28%.



However, **the GST Compensation Cess continues to remain intact** in order for the Centre to support the states for the temporary loss of revenue due to the reduction of tax rates.

Procedural changes to improve the ease of doing business

- **Operational Goods and Services Tax Appellate Tribunal (GSTAT):** The tribunal will become operational by the end of 2025 to expedite dispute resolution, with the Principal Bench also serving as the National Appellate Authority for Advance Ruling.
- New simplified GST registration scheme for small businesses and small suppliers selling through e-commerce platforms.
- The system for granting 90% provisional refunds for zero-rated and inverted duty structure cases will be implemented based on risk assessment from November 1, 2025.
- A nationwide rollout of **biometric-based Aadhaar authentication for registration applicants** was also approved to **combat fraudulent claims**.

2.2 Income-tax Act, 2025

Why in the news?

The Income-tax Act, 2025 has been passed to replace the long-standing Income-tax Act of 1961. It is set to be implemented from April 1, 2026.

About

The upcoming legislation is aimed more at modernisation and simplification rather than major tax reforms. It largely focuses on **reorganising and clarifying provisions without altering current tax rates or overall policy**.

- Introduces a uniform term “Tax Year” to replace older concepts like “Assessment Year” and “Previous Year.”
- Uses simpler legal drafting and logically arranges provisions for easier understanding and compliance.
- Consolidates frequently amended sections into a structured format, for example, grouping all rules relating to Tax Deducted at Source under Section 393.
- Emphasises digital integration to minimize direct interaction between taxpayers and officials.
- **Officially defines “Virtual Digital Assets” (VDAs)**, covering cryptocurrencies and other blockchain-based tokens.

2.3 System of National Accounts 2025 (SNA 2025)

Why in news?

The United Nations Statistical Commission has approved the System of National Accounts 2025 (SNA 2025), which will serve as the updated global methodology for measuring economic activity.

About

SNA 2025 replaces the earlier framework of SNA 2008 and expands the scope of national accounting. It incorporates aspects like inequality, environmental sustainability, and unpaid work, moving beyond the narrow focus on GDP.

Key Features

- **Natural Capital Accounting:** Resource extraction, such as coal, minerals, oil, and gas, is classified as a production cost, while renewable sources like solar, wind, and hydropower are treated as valuable assets.
- **Distributional Accounts:** Data on income, wealth, consumption, and savings is presented for different household groups, highlighting disparities across society.

- **Recognition of Unpaid Work:** Household and caregiving activities are factored into extended accounts, providing visibility to the contributions of women and informal labour.
- **Policy Relevance:** Connects measures of national growth to equity, environmental balance, and inclusive development.

United Nations Statistical Commission (UNSC)

- Established in 1947, it functions as the apex body of the global statistical system.
- Composed of **24 member states** elected by the UN Economic and Social Council for four-year terms, ensuring **equitable geographical representation**.
- Supported by the United Nations Statistics Division (UNSD), which acts as its secretariat.

2.4 FAO Food Price Index (FFPI)

Why in the news?

The FAO Food Price Index (FFPI) climbed to 130.1 points in July 2025, marking its highest level in more than two years. The increase was largely driven by record-high meat prices and a rebound in vegetable oil prices, even though cereal, dairy, and sugar prices showed declines.

About FFPI

- The index is issued every month by the Food and Agriculture Organisation (FAO) of the United Nations.
- It was first launched in 1996, with its calculation method most recently updated in July 2020.
- The FFPI measures international price movements **across five major food commodity groups: cereals, vegetable oils, dairy products, meat, and sugar**.
- The composite index is weighted using average export values from 2014–2016.
- It **reflects international export prices**, rather than domestic retail or wholesale values.
- Both nominal and real indices are provided to allow comparison of price trends across different periods.
- Price data is drawn from global trade flows and refreshed on a **monthly basis**.

2.5 RBI directive on consolidating core banking functions

Why in the news?

The Reserve Bank of India (RBI) has proposed new norms aimed at aligning the regulatory framework for **Non-Banking Financial Companies (NBFCs), commonly called shadow banks**, with that of traditional banks. The move is intended to curb risks in the rapidly expanding NBFC sector and prevent complicated, overlapping lending structures.

About the directive

- In October 2024, the RBI rolled out a draft circular titled “Forms of Business and Prudential Regulations for Investments” as part of an initiative to consolidate core banking operations within a single entity for every banking group.
- The regulation requires that **only one entity in a bank group can engage in a specific line of business**. For example, if a bank issues personal loans, its NBFC subsidiary will not be permitted to do the same.
- The intention is to **eliminate overlap between banks and their subsidiaries** in lending operations.
- Large gold-financing firms with microfinance arms may face challenges, as their subsidiaries would no longer be able to issue micro-loans using gold as collateral.

- The Indian Banks' Association has sought more time for compliance, asking to extend the initial two-year timeline to as much as five years in order to restructure operations.

Background

- The RBI has consistently worked on tightening NBFC regulations to bring them closer to those for banks, particularly in high-risk lending.
- In October 2021, the RBI introduced a **four-layered regulatory framework** for NBFCs, **based on size, complexity, and interconnectedness**. Entities in the highest tier are subject to bank-like rules, including stricter capital and governance requirements.
- In 2024, the RBI **raised risk weights for unsecured personal loans for both banks and NBFCs**, effectively requiring lenders to hold more capital for such exposures.
- In May 2025, new digital lending guidelines were issued to ensure transparency and consumer protection. These included mandatory clear disclosures, loan disbursements directly into borrowers' bank accounts, and stricter consent-based data practices.

2.6 India's Rating Upgrade by S&P

Why in the news?

S&P Global Ratings has raised India's long-term unsolicited sovereign credit rating to **BBB from BBB-** after nearly 18 years. The upgrade reflects India's strong economic resilience, progress in fiscal consolidation, and a steady policy environment.

About the upgrade

- This is the first sovereign rating improvement by S&P for India since January 2007.
- **The long-term sovereign rating was revised upward from BBB- to BBB.**
- **The short-term sovereign rating was upgraded from A-3 to A-2.**
- **The transfer and convertibility assessment also moved up from BBB+ to A-.**

Reasons for the upgrade

- India's economy continues to register strong GDP growth supported by sound macroeconomic fundamentals.
- The government has shown sustained commitment to fiscal consolidation along with better quality of public expenditure.
- Consistent and predictable monetary policy has anchored inflation expectations and contributed to overall macroeconomic stability.

Moody's	S&P	Fitch	DBRS
Aaa	AAA	AAA	AAA
Aa1	AA+	AA+	AA (high)
Aa2	AA	AA	AA
Aa3	AA-	AA-	AA (low)
A1	A+	A+	A (high)
A2	A	A	A
A3	A-	A-	A (low)
Baa1	BBB+	BBB+	BBB (high)
Baa2	BBB	BBB	BBB
Baa3	BBB-	BBB-	BBB (low)
Ba1	BB+	BB+	BB (high)
Ba2	BB	BB	BB
Ba3	BB-	BB-	BB (low)
B1	B+	B+	B (high)
B2	B	B	B
B3	B-	B-	B (low)
Caa1	CCC+	CCC+	CCC (high)
Caa2	CCC	CCC	CCC
Caa3	CCC-	CCC-	CCC (low)
-	D	D	D

Sovereign Ratings by various agencies

2.7 Centre for Processing Accelerated Corporate Exit (C-PACE)

Why in the news?

The Centre for Processing Accelerated Corporate Exit (C-PACE) has significantly shortened the timeline for voluntary company closures. Applications that earlier took over two years to be cleared through different jurisdictional Registrars of Companies are now being processed in less than two months on average.

About

- Established in May 2023 by the **Ministry of Corporate Affairs (MCA)** as a centralized platform to simplify and **speed up the voluntary strike-off of companies and LLPs**.
- All such applications are now routed exclusively through C-PACE, replacing the earlier system where they were handled by different Registrars of Companies.
- Communications and processing are conducted entirely through the **MCA's central online portal**.
- The mechanism has reduced closure timelines drastically, from more than two years to under two months.
- Designed as a **transparent and simple mechanism for dormant entities**, i.e., businesses that have been inactive for at least two years and carry no major assets or liabilities.

Eligibility for voluntary strike-off via C-PACE

- The company/LLP must have ceased operations for the past two consecutive financial years.
- It should not have any pending litigations, dues, or outstanding obligations.
- Approval must be obtained from a majority of shareholders or members before applying.

2.8 Regulated Venue for Pre-Listing Companies

Why in the news?

The Securities and Exchange Board of India (SEBI) has suggested setting up a regulated marketplace where the shares of companies yet to be listed can be traded.

About the proposal

- The platform will operate under SEBI's supervision to allow **trading of shares of unlisted firms before they launch an Initial Public Offering (IPO)**.
- It is aimed at **replacing the unregulated grey market** with a formal and transparent system.
- Such a mechanism will help in genuine price discovery ahead of the IPO process.
- The government will also be able to ensure proper tax collection and revenue generation from these transactions.
- Investor protection will be enhanced by bringing informal share trading activity under legal and regulatory oversight.

2.9 Advance Authorisation Scheme

Why in the news?

Through a notification dated 28 August 2025, the **Directorate General of Foreign Trade (DGFT)** has extended the export obligation period to 18 months under the Advance Authorisation Scheme for products covered by mandatory Quality Control Orders of the Department of Chemicals & Petrochemicals.

About the scheme

- The Advance Authorisation Scheme is designed to promote exports by enabling **duty-free imports of raw materials** and other necessary inputs used in the production of export goods.
- Exporters are permitted to import inputs without paying customs duty, provided they **fulfil a specified export obligation** within the allowed time period by manufacturing and exporting the finished goods.
- The scheme is **implemented and monitored by the DGFT**.
- It is **available to both direct manufacturer-exporters and merchant exporters** who work in association with supporting manufacturers.

- The benefits also extend to deemed exports and intermediate supplies.
- Applicants must **possess a valid Importer-Exporter Code (IEC) and a Digital Signature Certificate (DSC)** to avail of the scheme.

Non-compliance provisions

- Exporters failing to discharge their export obligation within the prescribed period are required to repay the customs duty that was waived, along with applicable interest.
- Additional penalties may be imposed, and in serious cases, the exporter can be included in the Denied Entity List, which bars access to future export incentives.

2.10 Export Promotion Mission

Why in the news?

The Government of India is set to roll out the Export Promotion Mission to **shield Indian industries from external trade disruptions**, such as recent tariff hikes by the United States. The initiative was first announced in the Union Budget on 1 February 2025, and the **Directorate General of Foreign Trade (DGFT) has since shared the framework** with export promotion councils.

About the mission

- The scheme is **aimed at strengthening India's market access and safeguarding exports** against global shocks.
- It consists of two primary components: **NIRYAT PROTSAHAN** (trade finance assistance for exporters) and **NIRYAT DISHA** (strategies for expanding and diversifying international market access).
- **Key features include:**
 - Simplification of trade procedures to reduce compliance hurdles.
 - Easy access to credit, particularly for MSMEs and e-commerce exporters.
 - Creation of overseas storage and logistics facilities to enhance supply chain efficiency.
 - Support for identifying and entering untapped export markets, as well as diversifying export products.
 - Global branding and promotional campaigns for Indian goods.
- The **Ministry of Commerce and Industry** serves as the nodal authority for the mission.

IMPORTANT CONCEPTS IN NEWS

2.11 Forex Swap Auction

A forex swap auction is a monetary policy tool through which a central bank, such as the Reserve Bank of India (RBI), carries out a **temporary exchange of domestic currency** for foreign currency in coordination with commercial banks. The mechanism helps in regulating liquidity conditions in the economy and provides stability to foreign exchange markets.

Types of forex swap auctions

- **Sell-Buy Swap:** The central bank sells foreign currency to the market, thereby injecting foreign currency liquidity while absorbing domestic currency for a fixed period.
- **Buy-Sell Swap:** The central bank buys foreign currency from the market, absorbing excess foreign currency and simultaneously releasing domestic currency into the financial system.

2.12 Variable Reverse Repo Rate (VRRR)

The Variable Reverse Repo Rate (VRRR) is a liquidity management tool used by the Reserve Bank of India (RBI) to **absorb excess cash** from the banking system.

- Under VRRR, **RBI borrows money from commercial banks** through an auction process.
- Banks with surplus liquidity **submit bids by quoting the interest rate** at which they are willing to lend funds to the RBI.
- The RBI then accepts bids sequentially, beginning from the lowest quoted rate, until the predetermined liquidity absorption target is achieved.
- Unlike the fixed reverse repo facility, where the interest rate is pre-determined by RBI, **VRRR relies on a market-driven rate discovery mechanism.**

2.13 Variable Repo Rate (VRR)

- The Variable Repo Rate (VRR) is a liquidity management tool of the Reserve Bank of India (RBI).
- It works as a repurchase agreement where **banks borrow funds from the RBI by pledging eligible government securities.**
- Unlike fixed-rate repos, **the interest rate in VRR is not predetermined**; instead, it is arrived at through an auction process where participating banks place **competitive bids.**

This mechanism mainly **serves to supply liquidity to the financial system** when required.

2.14 Overnight Call Rate

- The Overnight Call Rate is the **interest charged on short-term, unsecured funds** that banks lend to one another for a **single day in the interbank call money market.**
- Since these borrowings are unsecured, **no collateral is involved**, and the transactions rely on trust between regulated institutions.
- This rate **serves as an indicator of immediate liquidity conditions** in the financial system and tends to fluctuate, particularly at quarter-end periods or during temporary mismatches in liquidity.

2.15 TREPS Rate (Tri-Party Repo)

- It is the interest rate for **secured overnight borrowing or lending**, where the loan is backed by eligible government securities as collateral.
- A **third-party clearing and settlement agency** (in India, usually the Clearing Corporation of India Limited – CCIL) manages the entire process, ensuring smooth transfer of funds and securities.

TREPS replaced the earlier **CBLO (Collateralised Borrowing and Lending Obligation)** system and is widely used by mutual funds, banks, and other financial institutions to manage short-term liquidity safely.

2.16 Cheque Truncation System (CTS)

Cheque Truncation System (CTS) is a system where **physical cheques are scanned and digitised** at the presenting bank, and electronic images and data are sent for clearing, eliminating the need to physically move cheques.

- Reserve Bank of India (RBI) will implement a faster cheque-clearing system under the Cheque Truncation System (CTS), reducing current settlement times (which can take 1–2 working days) to just a few hours. This will be **done using continuous clearing and real-time settlement, replacing the older batch processing model.**

3. GEOGRAPHY

3.1 Mud Waves buried beneath the Atlantic seabed

Why in the news?

A 2025 study in *Global and Planetary Change* discovered 117-million-year-old mud waves buried beneath the Atlantic seabed near Guinea-Bissau.

About

- Mud waves are **large, rhythmic sedimentary bedforms** found on the **ocean floor**, typically created by persistent bottom currents.
- These waves consist of **layered sequences of sediment** that serve as **geological records, revealing information about the history** of ocean currents over time.

Formation

- Around 117 million years ago, during the **early Cretaceous period, the North Atlantic Ocean was still young** and partly separated from the Southern Ocean basins. At that time, **a new opening called the Equatorial Atlantic Gateway formed**, allowing dense, salty water from the young North Atlantic to pour into the southern basins.
- This influx of heavy, saline water collided with the older mud- and organic-rich waters in the south, **stirring up massive amounts of sediment** and triggering giant underwater "**mud avalanches**" along the seabed.
- Over time, powerful underwater currents continued to push and accumulate these sediments into large, rhythmic, **wave-like patterns known as mud waves**.
- These formations on the Atlantic seabed are a geological record of **deep-water density flows that shaped the ocean floor** during that period and **provide insight into early ocean circulation and its influence on Earth's climate**.

3.2 Nickel-Copper-Platinum Group Elements (Ni-Cu-PGE)

Why in the news?

A potential Nickel-Copper-Platinum Group Elements (Ni-Cu-PGE) mineral zone has been discovered in the **Bhalukona-Jamnidih block, Chhattisgarh**.

About

Bhalukona-Jamnidih block:

- It hosts **mafic-ultramafic intrusive rocks** like gabbro, pyroxenite, and meta-olivine websterite.

In geography, **mafic and ultramafic igneous** rocks are classified by their low silica content, with ultramafic rocks having less than 45% silica and mafic rocks having 45-55% silica

Nickel-Copper-Platinum Group Element (Ni-Cu-PGE) deposits are globally significant sources of essential metals for high-tech, green energy, and industrial applications.

Applications

- **Nickel (Ni)**: Used in **EV batteries, stainless steel, and aerospace components**.
- **Copper (Cu)**: Essential for **electric wires, renewable energy systems, electronics**.
- **PGE (Pt, Pd, Rh)**: Used in **catalytic converters, fuel cells, and green hydrogen production**

3.3 Cloudburst

Why in news?

Recent Cloudburst in Uttarakhand and Jammu and Kashmir.

About

- The India Meteorological Department (IMD) defines a cloudburst as rainfall exceeding **100 mm per hour over an area of about 20–30 sq. km.**
- It is most often associated with **cumulonimbus clouds** in mountainous regions. The event occurs due to a combination of **orographic lift and convection currents**, which **rapidly accumulate moisture** in the atmosphere before collapsing violently.

Impacts

- Cloudbursts can trigger **flash floods, landslides, and large-scale damage to infrastructure**, particularly in hilly and mountainous terrains, making them highly destructive natural events.

Mini Cloudburst

According to the Indian Institute of Tropical Meteorology (IITM), a mini cloudburst is a **sudden, high-intensity rainfall event producing 5 cm or more of rain in one hour over an area of approximately 20–30 sq. km.**

3.4 C-Flood

About

C-FLOOD is a **web-based platform** that provides **two-day advance inundation forecasts** up to the **village level** in the form of flood inundation maps and water level predictions

Key Features

- C-Flood **integrates flood modelling data from various national and regional agencies**, functioning as a comprehensive decision-support tool for disaster management.
- The system uses **advanced 2D hydrodynamic modelling** to simulate flood scenarios.
- Forecasts include **inundation maps and water level predictions with high-resolution, village-level breakdown** (utilising satellite-based datasets and ground-based hydrological observations).
- Initial coverage: River basins covered initially- Mahanadi, Godavari and Tapi basins.

Development and collaborations

C-Flood was developed collaboratively by the **Central Water Commission (CWC), C-DAC Pune, and the National Remote Sensing Centre**. It is executed **under the National Supercomputing Mission (NSM)**, jointly steered by the Ministry of Electronics and Information Technology (MeitY) and the Department of Science and Technology (DST).

4. ENVIRONMENT

CLIMATE CHANGE

4.1 Kyoto Protocol

Why in the news?

The International Court of Justice (ICJ) has recently delivered an advisory opinion reaffirming that the Kyoto Protocol of 1997 continues to hold legal force, even after the enforcement of the Paris Agreement in 2015.

- The Court clarified that the **absence of new commitment periods does not equate to the termination of the treaty**. Kyoto remains an active part of international climate law.
- It further stressed that earlier obligations, including first-period emission reduction targets, can still be assessed for compliance.
- The ruling highlights that Kyoto and Paris coexist within the climate regime rather than replacing one another.

The **International Court of Justice (ICJ)** is the principal judicial organ of the United Nations (UN), responsible for settling legal disputes **between States** and issuing **advisory opinions** on legal questions referred to it by authorized UN organs and agencies. Established in 1945 by the UN Charter, it is located in The Hague, Netherlands, and is **composed of 15 judges** elected for nine-year terms

About the Kyoto Protocol

- **Negotiated in 1997 and officially enforced in 2005 under the UN Framework Convention on Climate Change (UNFCCC).**
- Recognised as the first legally binding climate treaty that required industrialised nations (Annex-I countries) to cut greenhouse gas emissions.
- **Built on the principle of Common but Differentiated Responsibilities and Respective Capabilities (CBDR-RC)**, acknowledging varied capacities and historical responsibilities of countries.
- **Later replaced in spirit by the Paris Agreement (2015)**, which moved away from Kyoto's top-down legal targets and introduced a voluntary, bottom-up model through Nationally Determined Contributions (NDCs).
- The protocol saw limited global participation: the United States never ratified it, while countries like Canada and Japan eventually withdrew or failed to comply.

4.2 Joint Crediting Mechanism (JCM)

Why in the news?

India and Japan have recently signed a Memorandum of Cooperation (MoC) to **operationalise the Joint Crediting Mechanism**, aimed at promoting low-carbon technology collaboration and emission reduction projects.

About the JCM

- The JCM is a **bilateral, market-oriented arrangement** initiated by Japan to jointly work with partner countries **on greenhouse gas (GHG) reduction**.
- Through the mechanism, advanced decarbonization technologies are deployed in host nations, and the resulting emission reductions are tracked.
- The system **allows Japan to account for its technological contributions** toward fulfilling its international climate goals under the Paris Agreement.

Indo-Japan Agreement under JCM

- Marks the first formal MoC for structured cooperation in low-carbon technology between the two nations.
- Focuses on equipment, machinery, infrastructure, and system-based collaborations with potential for local manufacturing.
- The implementation will be supervised by India's National Designated Authority for Carbon Markets.
- **Allows India to generate and exchange carbon credits with Japan, in line with Article 6.2 of the Paris Agreement**, which enables cooperative approaches through carbon markets.

4.3 National Designated Authority (NDA)

Why in the news?

The Ministry of Environment, Forest and Climate Change (MoEFCC) has issued a notification detailing the structure of the National Designated Authority (NDA). The body will have 21 members, chaired by the Environment Secretary, and will include representatives from key ministries such as External Affairs, Steel, Renewable Energy, and NITI Aayog.

About NDA

- The **establishment of NDAs is a requirement under Article 6 of the Paris Agreement (2015)**, which provides the framework for international cooperation on carbon markets.
- The NDA will serve as the national regulatory body to oversee projects generating emission reduction credits under global climate mechanisms.

Functions of NDA:

- Recommend climate-related projects that can participate in international carbon credit trading under Article 6.
- **Evaluate, approve and periodically revise the list of eligible activities.**
- Authorize India's use of carbon credits to meet its Nationally Determined Contributions.

India's Nationally Determined Contributions (NDCs)

- Cut the emissions intensity of GDP by 45% by 2030 compared to 2005 levels.
- Ensure 50% of electricity generation capacity comes from non-fossil-fuel sources by 2030.
- Develop an additional carbon sink capable of removing 2.5–3 billion tonnes of CO₂ through expanded forest and tree cover by 2030.

Article 6 of the Paris Agreement

- Provides the **foundation for international carbon trading systems.**
- Article 6.2 and 6.4 enable market-based instruments like carbon markets for emission reductions.
- Article 6.8 establishes provisions for non-market approaches to cut greenhouse gases.
- The final negotiating text for Article 6 was adopted at the COP-29 summit in Baku, Azerbaijan (2024).

POLLUTION

4.4 Geogenic (Natural) Sources of Water Contamination

Why in the news?

The 2024 Annual Groundwater Quality Report released by the Central Ground Water Board (CGWB) highlights extensive contamination of groundwater across more than 440 districts in India. **The pollutants include nitrates, fluoride, arsenic, uranium, heavy metals, and microbial pathogens.**

About

While human activities like industrial discharge and agricultural runoff worsen water pollution, natural geological processes also contribute significantly. **Many rock types naturally release heavy metals and toxic substances** into groundwater as they weather and interact with aquifers.

Rock Types and Associated Contaminants:

- **Black Shale (Sedimentary rock):** Known to release cadmium (Cd), zinc (Zn), arsenic (As), and molybdenum (Mo).
- **Basalt (Igneous rock):** Associated with elevated chromium (Cr), nickel (Ni), cobalt (Co), copper (Cu), and zinc (Zn).
- **Granite (Igneous rock):** Can leach copper (Cu) and zinc (Zn).
- **Fluoride:** Originates from minerals such as fluorite, apatite, and mica found across igneous, sedimentary, and metamorphic rocks.
- **Arsenic:** Mobilised in alluvial aquifers of the Gangetic belt, particularly aggravated by excessive groundwater pumping.
- **Cadmium:** Often traced back to the weathering of black shale formations.

4.5 Air Quality Life Index (AQLI)

Why in the news?

According to the Energy Policy Institute at the University of Chicago (EPIC), air pollution levels in South Asia rose by 2.8% in 2023 after a brief decline in 2022. The region remains the most polluted in the world, cutting average life expectancy by 3 years and by more than 8 years in the most severely affected zones.

About AQLI

- **The Air Quality Life Index (AQLI) translates air pollution levels into tangible impacts on human life expectancy, making pollution data easier to understand in health terms.**
- The index is **developed by EPIC**, a research initiative within the University of Chicago's Institute for Climate and Sustainable Growth.
- AQLI is one element of EPIC's broader Clean Air Program, alongside initiatives such as the EPIC Air Quality Fund.
- In 2019, EPIC-India partnered with the state of Gujarat to launch the world's first emissions trading system for particulate matter in Surat city.

India and South Asia Context

- **Northern India remains the most polluted area globally**, with around 544 million people (nearly 39% of India's population) exposed to extremely poor air quality.
- **Across India, all 1.4 billion citizens live in regions where particulate pollution exceeds WHO safety limits.**
- Even in India's least polluted zones, life expectancy could increase by almost 9.4 months if air quality met the WHO benchmark.

4.6 Ethanol Blending Issues

Why in the news?

Concerns have emerged that ethanol-petrol blending is leading to reduced fuel mileage in vehicles, raising debates about its cost-effectiveness despite its benefits in reducing crude oil imports.

About Ethanol Blending

Ethanol is blended with petrol to lower dependence on imported fossil fuels and promote cleaner energy. However, blending comes with a fuel economy trade-off, as ethanol produces less energy than conventional petrol.

Reasons for Mileage Reduction:

1. **Lower energy density:**
 - Ethanol carries about 30% less energy per litre compared to petrol.
 - **Vehicles need more volume of ethanol-blended fuel to cover the same distance,** leading to reduced mileage.
 - Fuel system adjustment:
 - Because ethanol contains oxygen, it allows cleaner and more complete combustion.
 - To maintain performance, engines inject more fuel, which increases overall consumption.
2. **Engine calibration:**
 - **E20-compliant vehicles (newer models):** Built to handle ethanol blends efficiently, they face only a 1–2% dip in mileage.
 - **Older/non-compliant vehicles:** Struggle with higher blends, often showing a 3–6% or greater reduction in mileage.

Other Challenges with Ethanol Blending

- **Component wear and tear:**
Ethanol absorbs moisture (hygroscopic nature), which may corrode fuel system parts like rubber seals, gaskets, and pipelines not designed for it.
- **Moisture absorption and phase separation:**
In humid climates, ethanol tends to absorb water. This can lead to the separation of ethanol-water from petrol, potentially causing performance issues and engine damage.

4.7 Sustainable Aviation Fuel (SAF)

Why in the news?

Indian Oil Corporation has become the first in India to secure ISCC CORSIA certification for the production of Sustainable Aviation Fuel (SAF) at its Panipat refinery. It has also signed an MoU with Air India to begin the supply of SAF for aviation use.

About SAF

- Sustainable Aviation Fuel (SAF) is a **renewable alternative to conventional jet fuel, produced from non-petroleum feedstocks.**
- It can be safely blended up to 50% with regular aviation turbine fuel without altering aircraft engines or airport infrastructure.
- By recycling carbon that is already part of the atmosphere (from waste, residues, biomass, or captured CO₂), SAF offers up to an 80% reduction in lifecycle carbon emissions compared to fossil jet fuels.
- **Being a “drop-in” fuel, it mirrors the chemical composition of traditional aviation fuel** and therefore requires no technological modifications in airlines’ existing systems.

Sustainability Certification

- **ISCC CORSIA Certification:** A globally recognised sustainability certification that ensures the SAF meets environmental and social standards set under ICAO’s CORSIA framework.
- **CORSIA (Carbon Offsetting and Reduction Scheme for International Aviation):** Introduced by the International Civil Aviation Organisation (ICAO) to curb international aviation’s greenhouse gas emissions through offsets and the adoption of low-carbon technologies like SAF.
- **ISCC (International Sustainability and Carbon Certification):** A voluntary scheme that verifies the renewable and sustainable origin of biofuels and raw materials. Its aviation-specific extension ensures alignment with CORSIA compliance.

4.8 Tri-structural Isotropic (TRISO) Particle Fuel

Why in the news?

The US Department of Energy (DOE) has chosen Standard Nuclear as the first company to advance TRISO nuclear fuel development. This move aims to cut dependence on Russian uranium and strengthen US nuclear supply chains.

About TRISO Fuel

- A high-performance fuel designed **for advanced nuclear reactors, offering superior safety.**
- Each particle has a uranium-carbon-oxygen kernel, surrounded by three protective carbon-ceramic layers that contain radiation.
- The particles are tiny (roughly the size of poppy seeds) but can be compacted into pellets or pebbles for use in reactors.

Importance

- Highly resistant to neutron damage, corrosion, and oxidation.
- Each particle is a self-contained barrier, minimising radiation risks even under extreme conditions.
- Suitable for molten salt reactors, high-temperature gas-cooled reactors, and next-generation SMRs (Small Modular Reactors) / Gen-IV reactors.

WILDLIFE CONSERVATION

4.9 Critical Tiger Habitat (CTH)

Why in the news?

In August 2025, the National Tiger Conservation Authority (NTCA) proposed declaring Nugu Wildlife Sanctuary (Karnataka) as a Core Critical Tiger Habitat (CTH).

About

- CTH refers to the core zone of a tiger reserve, legally designated as inviolate to safeguard tigers and prey species.
- Declared by state governments using scientific evidence, in consultation with an expert committee, under the **Wildlife (Protection) Act, 1972** (amended 2006, Section 38V).
- While resettlement of Scheduled Tribes and forest dwellers may be required, it must be voluntary, transparent, and with Gram Sabha consent.

Difference:

- **Critical Tiger Habitat (CTH):** Declared by states under the Wildlife Protection Act
- **Critical Wildlife Habitat (CWH):** Declared by the central government under the Forest Rights Act, 2006 (FRA), requiring Gram Sabha consent.

About Nugu Wildlife Sanctuary

- **Part of the Nilgiri Biosphere Reserve** and a **buffer to Bandipur Tiger Reserve.**
- Important for tiger and elephant populations.
- Also supports species like smooth-coated otter and marsh crocodile.

4.10 The Sundarbans

Why in the news?

The Sundarbans Tiger Reserve (STR) has become India's second-largest tiger reserve after adding 1,044.68 sq. km, making its total area 3,629.57 sq. km.

About

The only mangrove habitat for tigers in the world straddling India and Bangladesh.

Declared Tiger Reserve: **1973** - Biosphere Reserve: **1989**.

UNESCO recognitions:

- Indian Sundarbans – World Heritage Site (1987).

- Bangladesh Sundarbans – World Heritage Site (1997).
- Listed under UNESCO’s Man and Biosphere Program (MAB, 2001).
- Ramsar Wetland Site: 2019

Flora:

- Dominated by mangrove species like Sundari, Gewa, and Golpata.
- Adaptations include **pneumatophores (breathing roots) for saline, waterlogged conditions.**

Fauna:

- **Flagship species:** Royal Bengal Tiger (adapt swimmer).
- **Others:** estuarine crocodiles, fishing cats, spotted deer, water monitor lizards, olive ridley turtles, and rich bird diversity (kingfishers, herons).

4.11 Dibru-Saikhowa National Park (DSNP)

Why in the news?

A study published in Earth Journal (2024) showed that grasslands in DSNP are being altered by both native tree species (*Bombax ceiba*, *Lagerstroemia speciosa*) and invasive weeds (*Chromolaena*, *Parthenium* and *Mikania*). This threatens its grassland ecosystems and **feral horse** population.

About

- Located in eastern Assam, between the Brahmaputra and Dibru rivers.
- Characterised by wetlands, grasslands, and semi-evergreen forests, with an island-like landscape.
- Declared Biosphere Reserve: **1997**.
- Declared National Park: **1999**.

Fauna

- **Critically Endangered:** Bengal Florican.
- **Endangered:** Hog deer, Swamp grass babbler.
- Habitat for ~200 feral horses, descendants of WWII cavalry animals.
- Floodplains support high avian diversity.

Feral Horse

'Feral horses' refers to horses or populations of horses that have **escaped domestication** or are descended from domesticated individuals. Feral horses are **found in India only at the Dibru-Saikhowa National Park** in Assam. Believed to be descendants of domestic horses, their origin is debated but likely connected to horses left behind by Allied troops after World War II or earlier cart horses.

4.12 Vantara Zoo

Why in the news?

Public debate sparked after the relocation of elephant Madhuri (Mahadevi) from Kolhapur (Maharashtra) to Vantara, Jamnagar, leading the Maharashtra CM to engage with the Vantara team.

About

- **Vantara (Star of the Forest):** A private, non-commercial wildlife rescue and rehabilitation facility set up by the Reliance Foundation in Jamnagar, Gujarat.
- **India’s largest privately managed animal rehabilitation centre**, focused exclusively on care, rescue, and rehabilitation, not recreation.
- Recognised with the Prani Mitra Award by the Animal Welfare Board of India.
- Currently no public access, though structured educational visits may be planned in the future.

4.13 Mines and Minerals (Development and Regulation) Amendment Bill, 2025

Why in the news?

Parliament has cleared the Mines and Minerals (Development and Regulation) Amendment Bill, 2025, focusing on easing regulations, encouraging investment, and modernising India's mineral sector.

Key Provisions

- **Expansion of mineral rights:** Existing leaseholders can apply to state governments to include additional minerals within their current lease.
- For critical/strategic minerals (like lithium, cobalt, and gold) – no extra royalty or premium required.
- For other minerals – equivalent additional royalty and premium must be paid.
- **Exploration funding:** The National Mineral Exploration and Development Trust (NMEDT) will now finance exploration and development projects both in India and abroad.
- **Captive mine liberalisation:** Captive mines, after meeting their end-use requirements, can sell up to 100% of their production in the open market.
- **Deep-seated minerals:** Leases may be expanded to cover contiguous areas for minerals found 200+ metres below the surface.
- **Trading platforms:** Legal provision for setting up regulated electronic marketplaces for mineral and metal trading.

SPECIES IN NEWS

4.14 Mouse Deer / Chevrotain

Why in the News?

The elusive **Silver-backed Chevrotain**, thought extinct for over 30 years, **has been rediscovered** in the Dry coastal forests near Nha Trang in the southern region of Vietnam.

About

- The mouse deer, also called chevrotain, is the **world's smallest hooved mammal**, belonging to the family Tragulidae.
- Though it resembles both a mouse and a deer, it is unrelated to either and represents a primitive ruminant lineage. It has even toes.
- It **lacks modern thermoregulation mechanisms** that are found in advanced artiodactyls.
- They are known for their **ability to submerge underwater for minutes to evade predators**.



Hooved animals, or ungulates, are mammals that walk on the tips of their toes, which are covered by a hard, protective layer called a hoof. Made of the same protein as fingernails and hair, the hoof allows the animal to bear its body weight. **Examples include horses, cattle, deer, and rhinoceroses,**

Habitat

- Found in the **tropical and subtropical forests** of South and Southeast Asia (**India, Vietnam, Thailand, and Sri Lanka**).
- The **African variant** resides in **West and Central African rainforests**.
- They often inhabit **dense undergrowth, lowland forests**, and remain **nocturnal and elusive**

Dietary Preference

- They are primarily herbivorous, but the African chevrotain occasionally consumes insects, crabs, and scavenged meat (an unusual trait for ruminants).

Silver-backed Chevrotain

- This is a **specific species** of chevrotain (mouse deer).
- It is endemic to **Vietnam** and is considered the world's rarest chevrotain.

4.15 Arctic Reindeer

Why in the news?

A new international study warns that Arctic reindeer populations could decline by up to 80% by 2100 due to climate change, especially in North America.

About

- The Reindeer, also known as **Caribou** (*Rangifer tarandus*), is a **large herbivorous ungulate (Hoofed) adapted to Arctic and sub-Arctic environments**.
- These animals are known for their extensive migratory behaviour, with herds travelling hundreds of kilometres annually.
- Its adaptations include **thick fur, 'wide hooves' for snow and 'ability to feed on lichens' in winter**.
- **IUCN Red List Status: Vulnerable.**

Habitat

- They are found across the **Arctic tundra and boreal forests of North America (Canada, Alaska, and Greenland) and Eurasia (Scandinavia, Russia)**.

Dietary Preference

- **Grazing** by reindeer maintains **balance in tundra vegetation, preventing shrub overgrowth**. They influence plant diversity, benefiting other Arctic species like birds and small mammals.
- Their feeding reduces plant dominance and indirectly regulates soil carbon release.

4.16 Sunflower seastar (*Pycnopodia helianthoides*)

Why in the news?

Vibrio pectenica is identified as the bacterium causing Sea Star Wasting Disease (SSWD), which led to the loss of over 5.8 billion sunflower sea stars across North America since 2013.

About

- It is a **large, fast-moving marine predator native to the Pacific Ocean, ranging from Alaska to California**, dwelling primarily on **kelp beds and rocky seabed**.
- It is vital in **regulating underwater ecosystems** by preying on sea urchins.
- Can grow up to 1 meter in diameter, making it one of the largest known sea stars.
- Capable of moving at a speed of up to **1 meter per minute using thousands of tube feet**.
- Possesses **16 to 24 soft, flexible arms, aiding rapid movement and predation**.
- Acts as a **top predator**, feeding on sea urchins, clams, and other invertebrates.
- Exhibits **vibrant hues** (orange, purple, red, or brown), **aiding in camouflage** and predator avoidance.
- Uses a water vascular system and coelomic fluid (analogous to blood) for nutrient transport and gas exchange



- **IUCN Red List Status: Critically Endangered**, due to mass mortality from Sea Star Wasting Disease (SSWD).

4.17 Jellyfish

Why in the news?

France's Gravelines Nuclear Power Station temporarily shut down three reactors after a massive jellyfish swarm clogged its cooling system.

- Gravelines Nuclear Power Station is one of the largest nuclear power plants in Europe, producing electricity through controlled nuclear fission. It uses pressurised water reactors (PWRs) to generate power.

About

- Jellyfish are **free-swimming marine invertebrates** belonging to the **phylum Cnidaria** and class Scyphozoa.
- They are found in **oceans worldwide**, from **surface waters to deep seas**.
- While "jellyfish" is a commonly used term, **most belong to *Aurelia aurita*** (also known as Moon Jellyfish).
- They have a **gelatinous, umbrella-shaped bell with tentacles** that contain **stinging cells, called nematocysts**.
- Their bodies are composed of about **95% water and lack bones, a brain, or a heart**.
- They primarily move passively with ocean currents but can occasionally pulsate their bell for **limited mobility**.
- One challenge associated with jellyfish is their ability to **form large blooms**, which are **rapid population explosions** that occur under favourable environmental conditions. These blooms can significantly impact the marine ecosystem.

4.18 Botryococcus braunii

Why in the news?

- The **Sea of Galilee, Jordan Rift Valley in north-eastern Israel**, has mysteriously **turned red**, alarming locals and tourists. Investigations revealed the cause to be algae blooms of *Botryococcus braunii*.

About

- *Botryococcus braunii* is a green **algae** producing **red carotenoid pigments when exposed to sunlight**.
- It is a pyramid-shaped **planktonic microalgae** widely distributed in freshwater, brackish, and saline environments **on all continents**.
- It naturally occurs in **temperate and tropical lakes and estuaries** and is known for producing significant amounts of **hydrocarbons**, making it important for **biotechnology, especially biofuel production**.
- Triggered by **climate change-induced warming and nutrient-rich waters (phosphorus, nitrogen)**, creating ideal conditions for bloom.



5. AGRICULTURE

5.1 Specialised fertilisers vs commodity fertilisers

Why in the news?

Speciality fertilisers are not included under the Nutrient-Based Subsidy (NBS) Scheme of the Department of Fertilisers, meaning they do not receive government subsidies.

About

Regular or commodity fertilizers mainly supply essential macronutrients for crop growth:

- Nitrogen (N) through urea
- Phosphorus (P) through di-ammonium phosphate (DAP)
- Potassium (K) through muriate of potash (MOP)

Specialised or enhanced-efficiency fertilisers:

- Improve nutrient uptake and utilisation by crops
- Minimise nutrient loss and reduce environmental damage
- Supply additional elements like secondary nutrients and micronutrients
- **Example: Urea Gold** contains 37% nitrogen, 17% sulphur and is enriched with humic acid for better soil health and nutrient efficiency.

Specialised fertilisers consist of different categories that are designed for efficient nutrient management and crop improvement:

- **Water-soluble fertilisers** for fertigation (direct supply to roots) and foliar feeding (quick absorption by leaves), such as monoammonium phosphate and potassium nitrate.
- **Controlled-release fertilisers** with polymer or sulphur coatings, as well as neem-coated urea, which slow down nutrient release into the soil.
- **Chelated micronutrients**, particularly effective in alkaline soils for enhancing nutrient availability.
- **Stabilised nitrogen fertilizers** using urease inhibitors to reduce nitrogen losses.
- **Fortified fertilisers** enriched with additional elements, for example, zincated single super phosphate.

Fertiliser companies in India have the freedom to import these products based on market demand.

Around 80% of India's speciality fertiliser imports—such as water-soluble nutrients, foliar sprays, controlled or slow-release products, and bio-stimulants—are supplied by manufacturers in China. India imports both speciality fertilisers and commodity fertilizers from China.

5.2 Digital Agriculture Mission

Why in the news?

Around 70 million farmers now have digital IDs linked to land records under India's Digital Agriculture Mission. The initiative aims to cover 11 crore farmers by FY27, enabling targeted schemes, credit access, insurance, and personalised Agri-services.

About

- Digital Agriculture Mission (DAM) was launched by the Government of India in September 2024 to digitally transform the agricultural sector.
- The initiative focuses on developing Digital Public Infrastructure (DPI) for agriculture through three core registries, collectively known as Agri Stack.

WHAT IS THE AGRISTACK?



The Report of the Committee on Doubling Farmer's Income, NITI Aayog's Discussion Paper on National Strategy for Artificial Intelligence, and the Farmers' Produce Trade and Commerce (Promotion and Facilitation) Act, 2020 all mention the use of electronic database for farmers meant to collect data about agriculture and use this to provide services to farmers.

1 WHAT DETAILS DOES IT COLLECT?

The data to be collected by the AgriStack includes: personal details, profile of the land held, production details, and financial details.



2 WHAT ARE THE PROPOSED BENEFITS?

1. Improved access to formal credit
2. Better quality of input
3. Smooth mechanism for marketing and price discovery



3 POTENTIAL ISSUES

1. Lack of consultations with farmer organisations
2. Algorithm based decision making will impact farmers' rights without transparency or accountability.
3. Incentives to harvest and process farm data for financial gain rather than benefit of farmers



4 HOW WILL THE LOSS OF PRIVACY IMPACT FARMERS?

1. Financial lending models relying on technology towards farmers may offer usurious rates for those in dire need.
2. There exist risks of exclusion which has been well documented by studies on Aadhaar linked welfare delivery systems
3. Algorithm based decision making may further reduce the agency of farmers



5 RECOMMENDATIONS

1. Understanding issues emerging from the leadership of farmer groups to include farmers in the decision making process
2. Necessity of long term study and advocacy to engage farmers effectively
3. Study the impact of a data protection law to ensure digital security and privacy



Key components of Agri Stack:

- **Farmers' Registry:** Provides every farmer with a unique digital identity or "Farmer ID".
- Links details such as land records, livestock owned, crops cultivated, and government benefits received.
- **Target:** Create digital IDs for 11 crore farmers within three years.
- **Geo-referenced Village Maps:** Combines geographic information systems (GIS) with official land records.
- Helps with land management, crop surveys, and dispute resolution.
- **Crop Sown Registry:** Based on a mobile-enabled Digital Crop Survey (DCS).
- Aims to provide real-time data on crops grown on every farm plot.
- Planned for nationwide implementation by 2025–26.

Krishi Decision Support System (Krishi-DSS):

A geospatial platform that combines information from satellites, weather patterns, soil data, and water resources, designed to support evidence-based decisions for both policymakers and farmers.

Provides services such as:

- Crop mapping.
- Automated prediction of crop yields.
- Monitoring of drought and flood situations.

Nationwide Soil Resource Mapping:

Conducted by the Soil and Land Use Survey of India (SLUSI), which focuses on detailed mapping of agricultural lands across the country.

Generates standardised soil maps to guide farmers in:

- Efficient land use
- Selecting suitable crops based on soil conditions.

5.3 Seed Traceability, Authentication, and Holistic Inventory(SATHI)

Why in the news?

Recent Development: India is scaling up the digital seed authentication system nationwide. Seed packets will carry unique QR codes for authentication.

About

A digital platform and mobile app launched by the Ministry of Agriculture and Farmers' Welfare. Aims to **protect farmers from counterfeit or poor-quality seeds** by ensuring transparency and accountability across the seed supply chain.

Recent Development:

- India is now using the digital seed authentication system, with the **seed packets carrying unique QR codes for authentication.**

How it works:

- Farmers can scan the QR code on seed bags to access verified information about the seed's source, quality, and certification status.
- Data is stored on a **central digital database, covering every stage of the seed's life cycle.**
- This ensures complete traceability, allowing seeds to be tracked back to their point of origin.

Legal Framework:

- The government is considering amendments to the Seeds Act, 1966, to make digital traceability mandatory and establish accountability in the system.

5.4 Fortified Rice Scheme

Why in the news?

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

About:

Launched as a pilot in 2019 and expanded for nationwide coverage in 2022. By March 2024, fortified rice fully replaced regular rice in all central government food distribution schemes.

Nodal Agency: Implemented by the **Department of Food and Public Distribution**, under the **Ministry of Consumer Affairs, Food and Public Distribution.**

Nutrient Fortification:

- Rice is **fortified with Iron, Folic Acid, and Vitamin B12.**
- Technical standards are framed and regulated by the Food Safety and Standards Authority of India (FSSAI).

Funding & Compliance

- The **Government of India bears 100% of the fortification cost.** Responsibility of states and union territories: Ensure quality control, maintain compliance standards and oversee proper storage and distribution.

WHAT IS FORTIFIED RICE?

Fortification is the practice of deliberately increasing the content of an essential micronutrient, i.e. vitamins and minerals (including trace elements) in food to improve its nutritional quality and provide a public health benefit with minimal risk to health



<p>➤ The fortification factor does not last for more than 45 days, so it isn't advisable to store fortified rice for long</p>	<p>➤ According to National Family Health Survey, 78.7% children and 75% in the district are anaemic and suffer from malnutrition</p>	<p>➤ In the first phase, fortified rice will be distributed in Badangi, Bobbili, Ramabhadrapuram and Terlam mandals</p>
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Complementary Nutrition Measures

- Guidelines also **encourage the use of double fortified salt and fortified edible oil** in welfare schemes like PM POSHAN and PMGKAY.
- Supported by partnerships such as the Gift Milk Programme of the National Dairy Development Board Foundation for Nutrition to improve child nutrition.

Policy Relevance: Flagship initiative under the Anaemia Mukta Bharat strategy.

5.5 Pradhan Mantri Krishi Sinchayee Yojna (PMKSY)

Why in the news?

Command Area Development & Water Management sub-component of **Har Khet Ko Pani (HKKP)** has been taken up for side-by-side implementation with the **Accelerated Irrigation Benefit Programme (AIBP)**

About

- Pradhan Mantri Krishi Sinchayee Yojna (PMKSY) is an umbrella scheme, consisting of **two major components** being implemented by the Department of Water Resources, River Development & Ganga Rejuvenation, Ministry of Jal Shakti.
- **Accelerated Irrigation Benefit Programme (AIBP)** (PMKSY aims to increase *irrigation potential utilisation*, improve *on-farm water use efficiency*, ensure *sustainability* of irrigated agriculture, and reduce wastage of water), and **Har Khet Ko Pani (HKKP)**.

Har Khet Ko Pani (HKKP) consists of four sub-components:

- Command Area Development & Water Management (CAD&WM);
- Surface Minor Irrigation (SMI);
- Repair, Renovation and Restoration (RRR) of Water Bodies;
- Ground Water (GW) Development.

5.6 Jute

Why in the news?

India has banned imports of certain jute products and ropes from Bangladesh through all land routes with immediate effect. These items can now only enter via the Nava Sheva Sea port in Maharashtra to ensure quality control and safeguard domestic industries.

About

Jute is a **long, soft, shiny vegetable fibre**, and is a **kharif crop** that can be spun into coarse, strong threads.

- Known as the “**Golden Fibre**” for its colour, versatility, and eco-friendly qualities.
- **India is the world’s largest producer**, contributing **around 70%** of global output.
- Major producing states are **West Bengal (dominates production), Assam, Bihar, Odisha, and Andhra Pradesh**.
- Requires warm, humid climate, alluvial soil, and heavy rainfall—ideal in–Ganga-Brahmaputra delta.

5.7 Apricot (*Prunus armeniaca*)

Why in the news?

Fresh apricots from Kargil, Ladakh, have been introduced to Saudi Arabia for the first time during India’s 79th Independence Day celebrations in Riyadh, under the One District One Product initiative.

One District One Product initiative:

The One District One Product (ODOP) initiative, under DPIIT, Ministry of Commerce & Industry, identifies one product per district to provide focused support for branding, marketing, and export promotion, aligning with the vision of *Atmanirbhar Bharat*.

About

Apricot (*Prunus armeniaca*) is a temperate fruit tree belonging to the **Rosaceae family**, closely related to peaches, plums, almonds, and cherries.

- In India, it is grown in Ladakh, Himachal Pradesh, Jammu & Kashmir, Uttarakhand, and other dry temperate and mid-hill regions. Distinct varieties in India include wild “**Zardalu**” and cultivated “**Khubani**.”
- Cultivated across **temperate regions**, especially in the **Mediterranean, Central Asia, and North America**.
- Trees are small and spreading with bright green leaves; the flowers are white and self-pollinated.
- Drought-resistant and long-lived (some up to 100 years).
- Rich in **vitamin A, natural sugars, and iron (especially dried apricots)**.

5.8 National Cooperative Exports Limited (NCEL)

Why in the news?

The Ministry of Cooperation (India) and the Ministry of Small & Medium Enterprise Development of Zambia, for the promotion of cooperatives, have signed an MoU to provide facilities and means for trade alliances between cooperatives of both nations.

About

- Established in 2023 as a cooperative society under the Multi-State Co-operative Societies (MSCS) Act, 2002.
- Created by the **Ministry of Cooperation** as an umbrella body to help Indian cooperatives expand into global markets and secure better value for their produce.

Promoters & Membership:

- Jointly promoted by several leading cooperative societies across India.
- Open to any legally registered cooperative society in India seeking membership.

Operational Mandates:

- NCEL’s bye-laws ensure that up to 50% of its net surplus is shared with member cooperatives.
- Distribution of surplus is based on members’ level of business participation.
- Final decision on surplus allocation rests with the NCEL Board.

5.9 Viksit Krishi Sankalp Abhiyan

About

A nationwide agricultural awareness and outreach drive was launched by the **Ministry of Agriculture & Farmers’ Welfare** in collaboration with the Indian Council of Agricultural Research (ICAR).

Objective:

- To connect modern agricultural research with on-ground farming practices.
- Focused on helping farmers adopt proven scientific innovations at the grassroots level.

Key Focus Areas:

- Promotion of climate-resilient farming practices.
- Distribution and awareness of certified seed varieties.

6. SCIENCE AND TECHNOLOGY

HEALTH

6.1 Rabies

Why in the news?

The Supreme Court has modified its previous order asking authorities in Delhi and its suburbs to move all stray dogs into shelters amid widespread protests by animal welfare groups.

About

Fatal **zoonotic viral disease** caused by the Rabies virus (RABV). It is classified by the WHO as a **Neglected Tropical Disease (NTD)**.

Vector & Transmission:

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

Infection & Spread:

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

6.2 Brain-Eating Amoeba

Why in the news?

Three new cases of the rare and deadly brain-eating amoeba (**Primary Amoebic Meningoencephalitis – PAM**) have been reported in Kerala, including the death of a nine-year-old child, raising public health concerns.

About

A free-living, single-celled organism (*Naegleria fowleri*) that causes Primary Amoebic Meningoencephalitis (PAM), a rare but fatal brain infection.

How does it cause infection?

- It enters the body through the nose while swimming or bathing in contaminated freshwater. It then migrates to the brain, destroying brain tissue.
- Not spread by drinking water and not person-to-person contagious

Where is it found?

- Primarily in warm freshwater bodies such as lakes, rivers, poorly maintained swimming pools, and splash pads. Survives in warm environments up to 46°C.
- Also detected in soil and dust in some cases.

6.3 Human African trypanosomiasis (sleeping sickness)

Why in the news?

Kenya has been certified by the World Health Organisation (WHO) as free from human African trypanosomiasis (sleeping sickness).

About

Human African trypanosomiasis (sleeping sickness) is a vector-borne parasitic disease **caused by *Trypanosoma brucei* protozoa**. It is transmitted by the bite of infected tsetse flies (*Glossina* species)

- Parasites enter the bloodstream and lymphatic system (first stage). Without treatment, they enter the central nervous system, damaging the brain (second stage)

- Occurs only in sub-Saharan Africa, mainly in rural communities dependent on farming, fishing, and livestock.

6.4 Rubella

Why in the news?

The World Health Organisation (WHO) declared Nepal free of rubella as a public health problem on August 18, 2025, making it the first country in the WHO's Southeast Asia Region to achieve this milestone.

About

Rubella (German measles) is a highly contagious **viral disease caused by the rubella virus**.

- It **spreads through respiratory droplets** when an infected person coughs or sneezes.
- Particularly dangerous during pregnancy, as it can cause miscarriage, stillbirth, or congenital rubella syndrome (CRS) in infants.
- Measles is a highly contagious viral disease that causes deaths among young children globally, while Rubella is a contagious, generally mild viral infection that occurs in children and young adults.

The Indian Scenario

- India still reports sporadic rubella cases but has made elimination a national health priority
- The Measles-Rubella (MR) campaign, launched in 2017, aims to vaccinate all children aged 9 months to 15 years.
- **India has a target for elimination of measles and rubella by 2023–24**, aligned with WHO's South-East Asia Regional goals.

6.5 Hepatitis D Virus (HDV)

Why in the news?

The World Health Organisation (WHO) and the International Agency for Research on Cancer (IARC) have officially **classified Hepatitis D virus (HDV) as carcinogenic**, placing it in Group 1 – known causes of liver cancer (alongside Hepatitis B and C).

About

Hepatitis D Virus (**HDV**) is a **blood-borne viral infection** that requires the presence of Hepatitis B virus (HBV) to replicate. It occurs as co-infection (simultaneous with HBV) or superinfection (after existing HBV). **Hepatitis B is several times more infectious than HIV/AIDS**.

6.6 Nanocarrier-based treatment for advanced liver cirrhosis

Why in the news?

This is the first study to show that therapeutic lymphangiogenesis using VEGF-C could repair lymphatic dysfunction in cirrhosis. Funded by DST's Nano Mission.

About

Cirrhosis leads to distorted lymphatic and blood vessels in the liver and intestines. Dysfunctional lymphatic vessels result in fluid buildup in the abdomen. Vascular Endothelial Growth Factor (VEGF-C) promotes the formation of new lymphatic vessels and facilitates:

- Increased lymphatic drainage in the gut.
- Reduced fluid buildup and portal blood pressure.
- **Boosted immune response (cytotoxic T-cell activity)**
- Decreased local and systemic infections.

6.7 Polyvalent Antivenom

Why in the news?

Experts at the Assam Snake Symposium 2025 called for region-specific antivenoms, highlighting the ineffectiveness of the current polyvalent serum in Northeast India (because other venomous species dominate).

About

Polyvalent Antivenom is a life-saving serum therapy used to neutralise venom from snakebites of multiple snake species.

- Traditionally derived from the venom of the “Big Four” snakes (neutralises the venom of the Indian cobra, common krait, Russell’s viper, and saw-scaled viper).
- Widely available at government and private hospitals. Affordable compared to region-specific alternatives.

6.8 Notch signalling

About

Notch signalling is an evolutionarily conserved cell-to-cell communication pathway that plays a **fundamental role in regulating cell fate, development, and tissue homeostasis** in most multicellular organisms.

- Its ability to control cell differentiation, proliferation, and apoptosis is critical for the proper formation and maintenance of various tissues and organs, including complex networks like the immune system.

Why in the news?

In a major advance for immunology and biotechnology, researchers have used AI-designed proteins to stimulate large-scale generation of T cells, opening new possibilities in immunotherapy, vaccine development, and immune regeneration.

- T cell development requires activation of the Notch signalling pathway
- Researchers used AI-driven protein design to create a library of synthetic Notch agonists. These soluble, artificial proteins effectively activate the Notch pathway.

6.9 Trastuzumab

Trastuzumab is a targeted **therapy drug**, specifically a monoclonal antibody, used to **treat certain types of breast and stomach cancers**.

- Biologics are lab-produced therapeutic products derived from living organisms or their components.
- **Monoclonal antibodies** are a specific type of biologics engineered to target a particular antigen or molecule on cells, like those found on cancer cells.
- Biosimilars are biologic products highly similar to an already approved original biologic (reference product) in terms of quality, safety, and efficacy. **Unlike generic drugs, which are identical copies of small-molecule drugs, biosimilars cannot be exact replicas of biologics.**

6.10 Zaynich (WCK 5222)

Zaynich is a novel **antibiotic to deal with Gram-negative “superbugs”** like *Pseudomonas aeruginosa*, *Acinetobacter baumannii*, and carbapenem-resistant Enterobacterales. It is a **combination of zidebactam and cefepime**.

- Gram-negative bacteria have a unique cell wall structure that includes an outer membrane in addition to the peptidoglycan layer, which provides an extra layer of defence against antibiotics. **Thus, they are called “superbugs”.**

- Carbapenems are a class of antibiotics considered to be the drugs of last resort for treating serious infections caused by multidrug-resistant (MDR) bacteria, particularly Gram-negative bacteria. However, some superbugs are showing resistance to carbapenems.

6.11 Bioactive Peptides (BAPs) or short protein fragments

- Bioactive peptides **consist of amino acids** that can regulate blood pressure, blood sugar, immunity and inflammation. These short peptides, formed during fermentation, interact with biomolecules through electrostatic forces, hydrogen bonding and hydrophobic interactions.
- Because their interaction with biomolecules creates reactions, it **opens up avenues for customised nutrition**.

INNOVATIONS IN TECHNOLOGY

6.12 *Escherichia coli* turned into a Mercury Sensor

Why in the news?

Researchers have engineered *Escherichia coli* (E. coli) bacteria into an efficient mercury sensor.

About

- Mercury contamination in water is a major global health issue as it bioaccumulates in the food chain.
- In this sensor, the **MerR protein acts as a molecular switch** that activates in the presence of mercury.
- When switched on, the bacteria produce phenazine molecules.
- These molecules interact with an electrode, generating an electric current.
- The strength of the current is directly proportional to the concentration of mercury, enabling precise detection.
- The **signal can be read by simple, low-cost electronic devices, making it a potential tool for water safety monitoring** in remote and resource-limited regions.

6.13 Isotopic Exchange Reaction

Why in the news?

India continues to use the H₂S–H₂O Bi-Thermal Chemical Exchange Process as a critical technology for producing heavy water (D₂O), a vital component in its nuclear power programme.

About Heavy Water:

- Heavy water is a form of water where the hydrogen atoms are replaced by deuterium, a heavier isotope of hydrogen that contains an extra neutron.
 - An isotope is a form of a chemical element with the same number of protons but a different number of neutrons in its nucleus, resulting in different atomic masses.
- Heavy water acts as a moderator and coolant in Pressurized Heavy Water Reactors (PHWRs), which form the backbone of India's nuclear power capacity.

About Isotopic Exchange Reaction

- The **process relies on isotopic exchange of hydrogen (¹H) and deuterium (²H) between hydrogen sulphide (H₂S) and water (H₂O).**
- Multiple cycles gradually enrich the deuterium concentration in water, yielding heavy water.
- This indigenous technology reduces dependence on imports and strengthens energy self-reliance.

Heavy Water Plants using this technology

1. Manuguru Heavy Water Plant (Telangana) near the Godavari River.
2. Kota Heavy Water Plant (Rajasthan) near Rana Pratap Sagar Lake.

Environmental Issues

Hydrogen sulfide (H₂S) is highly toxic, hence plants are designed with advanced safety systems and closed-loop operations to prevent leakage.

6.14 Strategic Interventions for Green Hydrogen Transition (SIGHT) Scheme

Why in the news?

India achieved a record-low price of ₹55.75/kg for Green Ammonia in the first Solar Energy Corporation of India (SECI) auction under the SIGHT Scheme.

About

- The SIGHT Scheme is a **financial mechanism under** the National Green Hydrogen Mission (NGHM) to accelerate the transition to green hydrogen.

Modes of Implementation

- **Mode 1:** Incentives awarded to the lowest incentive seeker.
- **Mode 2A:** Aggregated demand for Green Ammonia (fixed incentive).
- **Mode 2B:** Aggregated demand for Green Hydrogen (fixed incentive).

Key Features

- Competitive reverse auctions conducted by SECI and Oil PSUs.
- Oversight by a joint committee of the Ministry of New and Renewable Energy (MNRE) and the **Ministry of Petroleum and Natural Gas (MoPNG). Incentives apply only to hydrogen** certified under the notified “Green Hydrogen” standards.

National Green Hydrogen Mission (NGHM) Targets

- Achieve 5 million metric tonnes (MMT) of green hydrogen production per annum by 2030.
- Add ~125 GW of renewable energy capacity.
- Develop indigenous manufacturing capacity for hydrogen technologies.

Importance

- **Green hydrogen can serve as a direct fuel**, be blended with natural gas, or power fuel cells in vehicles.
- It can decarbonise hard-to-abate sectors such as **steel, cement, and chemicals**.
- To aid transport and storage, hydrogen is often converted into carriers like green ammonia or green methanol.
- Renewable fuels of non-biological origin (synthetic fuels), combining renewable hydrogen with captured CO₂, further reduce greenhouse gas emissions.

6.15 Deep Ocean Mission

Why in the news?

In August 2025, Indian “aquonauts” completed successful deep-sea dives to 5,000 meters in the Atlantic Ocean, a crucial preparatory step for deploying *MATSYA 6000*.

About

- Launched in 2021 **by the Ministry of Earth Sciences**, the Deep Ocean Mission is multi-disciplinary and **central to India’s Blue Economy policy**.

Key Components

1. **MATSYA 6000:** A manned submersible designed to carry three persons to 6,000 meters for ocean exploration.
 - Built by the National Institute of Ocean Technology (NIOT) with ISRO collaboration.
 - Features 96-hour emergency endurance and multiple fail-safe ascent systems.

2. **Deep-sea mining technologies:** Development of integrated mining systems for polymetallic nodules.
3. **Polymetallic sulphide exploration:** Mapping of resources along mid-ocean ridges.
4. **Climate services:** Ocean-based climate change advisory and modelling.
5. **Marine bio-resources:** Cataloguing deep-sea species, microbial studies, DNA banks, and bio-prospecting.
6. **Ocean energy and desalination:** Offshore Ocean Thermal Energy Conversion (OTEC) plants for power and potable water.
7. **Human resource development:** Training in ocean biology, engineering, and incubation of industry applications.



Only a handful of countries (U.S, Russia, France, Japan, China) currently operate manned submersibles, making this mission strategically significant.

6.16 National Deep Water Exploration Mission

Why in the news?

The Prime Minister announced the National Deep Water Exploration Mission on the 79th Independence Day to enhance offshore oil and gas discovery.

About

- A flagship initiative for energy security aimed at exploring untapped offshore reserves and seabed mineral resources.
- Nodal Agency: **Ministry of Petroleum and Natural Gas.**
- Supported by the Directorate General of Hydrocarbons (DGH) and allied institutions.

Key Features

- Focus on frontier zones like the Andaman-Nicobar Basin and Andhra Coast.
- Operates in sync with the Open Acreage Licensing Policy (OALP).
- Opens over 1 million sq. km of “No-Go” areas for exploration.
- **Employs seismic surveys, modern drilling, and AI-enabled exploration.**
- Encourages public-private participation, including global energy players.

6.17 UPI 3.0 with NFC and Wearables

Why in the news?

The National Payments Corporation of India (NPCI) is developing UPI 3.0 with IoT and wearable-enabled payment technologies.

About

- UPI 3.0 will support payments through IoT devices such as smart TVs, fridges, cars, washing machines, and smartwatches.
- Expected to expand credit-on-UPI, embedded payments, and cross-border interoperability.
- **Near-Field Communication (NFC):** Uses electromagnetic fields for short-range wireless communication between devices.

SPACE

6.18 Gaganyaan

Why in the news?

On August 24, 2025, ISRO successfully conducted the first Integrated Air Drop Test (IADT-01) to validate the parachute-based deceleration system of the Crew Module.

About

- **Gaganyaan is ISRO's human spaceflight mission** to send three **astronauts into a 400 km Low Earth Orbit (LEO)** for a three-day mission.
- First uncrewed flight (December 2025) will carry **Vyom Mitra** (a female humanoid robot, built by ISRO, that will fly ahead of human astronauts on unmanned Gaganyaan missions to test spacecraft systems and simulate human responses in space.)
- If successful, India will join Russia, the U.S., and China in achieving independent human spaceflight.

Spacecraft & Launcher

- **Orbital Module:**
 - *Crew Module* (conical capsule for astronauts, splashdown recovery).
 - *Service Module* (propulsion and power systems).
- **Human-rated Launch Vehicle:** Modified LVM3 rocket.
- Crewed mission planned for early 2027.

6.19 Himalayan Outpost for Planetary Exploration (HOPE)

- HOPE is a **simulation facility in Ladakh's Tso Kar Valley, chosen for its Mars-like environment** (low pressure, extreme cold, saline permafrost, and high UV).
- **Managed by ISRO's Human Space Flight Centre (HSFC).**
- Aims: Study astronaut health and performance for future Moon and Mars missions.
- Developed with collaboration from the Mars Society and academic partners.

6.20 Mira Variable Stars

Why in the news?

IUCAA-led astronomers used Mira variables to measure the Hubble constant with 3.7% precision.

About

- **Mira variables are pulsating red giant stars in late evolutionary stages.**
- Their brightness varies periodically due to outer-layer expansion and contraction.
- **Serve as "standard candles"** for measuring cosmic distances.
- Crucial for refining estimates of the Hubble constant and resolving the "Hubble tension."

6.21 UPM J1040–3551 AabBab

Why in the news?

Scientists discovered a rare quadruple star system-UPM J1040–3551 AabBab, where two brown dwarfs orbit two red dwarf stars.

About

- Extremely rare: less than 5% of brown dwarfs are found in such companion systems.
- **Red dwarfs:** True stars (0.08–0.6 solar masses) sustaining hydrogen fusion.
- **Brown dwarfs:** Substellar objects (13–80 Jupiter masses), incapable of sustained fusion—"failed stars."
- Discovery helps refine models of stellar formation and low-mass star systems.

7. DEFENCE

7.1 MiG-21

Why in the news?

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

About

The MiG-21 is a supersonic jet fighter designed by the Mikoyan-Gurevich Design Bureau (Soviet Union).

- Features a **delta wing design** and a **shock cone nose intake** for supersonic performance.
- Maximum speed: Mach 2.05 (~2,175 km/h).
- Operated in roles such as interceptor, ground attack, reconnaissance, and training.
- The MiG-21 *Bison* variant (2000s) included Israeli jammers, Russian missiles, partial glass cockpit, and helmet-mounted sight.



History in India

- First prototype flew in 1955; inducted into IAF in 1963.
- First squadron: No. 28 Squadron (*The First Supersonics*), based in Chandigarh.

Operational Role in Wars

- **1965 War:** Served as a frontline interceptor.
- **1971 War:** Played a decisive role, including strikes on Dhaka that accelerated victory.
- **Kargil War (1999):** Deployed for limited ground attack and air defence.
- **2019 Balakot aftermath:** A MiG-21 Bison shot down a Pakistani F-16, proving continued relevance.

The MiG-21 remains India's longest-serving fighter aircraft, a symbol of both glory and obsolescence.

7.2 Akashteer: Air Defence Control and Reporting System (ADCRS)

Why in the news?

During the 2025 conflict with Pakistan (*Operation Sindoor*), Akashteer was successfully deployed to neutralize multiple drone and missile attacks with a 100% kill rate.

About

Akashteer is a vehicle-mounted, network-centric Air Defence Control and Reporting System. It integrates sensors, communication links, and weapons to provide real-time battlefield awareness.

- Designed by **Bharat Electronics Limited (BEL)** in collaboration with **DRDO** and **ISRO**.
- Automates detection, tracking, and engagement of aerial threats, including enemy aircraft, drones, and missiles.

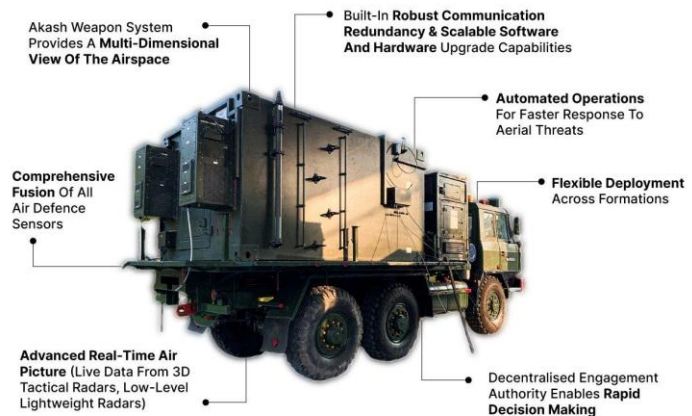
Key Features

- **Artificial Intelligence (AI):** Enables autonomous threat assessment and rapid target engagement.
- **Decentralised command:** Field commanders can engage threats locally without waiting for central clearance.
- **Sensor integration:** Combines data from Indian satellites, 3D Tactical Control Radars, Low-Level Lightweight Radars (LLLRs), and Akash Weapon Systems.
- **Tri-service connectivity:** Links with the IAF's *Integrated Air Command and Control System (IACCS)* and the Navy's *TRIGUN* network for consolidated situational awareness.

Note: *TRIGUN* is an Indian Navy AI-powered platform for Maritime Domain Awareness (MDA), integrating radar, sonar, and communication data for real-time detection of maritime threats.

The Bolt Of Akashteer

What India's AI-Powered Air Defence System Brings To The War Room



Source: ANI

Inc42

7.3 Integrated Air Defence Weapon System (IADWS)

Why in the news?

Under *Mission Sudarshan Chakra*, DRDO has developed and test-fired the Integrated Air Defence Weapon System (IADWS), creating a multi-layered shield against aerial threats.

About

The IADWS combines kinetic and non-kinetic systems to safeguard critical assets.

Components:

- **Quick Reaction Surface-to-Air Missile (QRSAM):**
 - Range: up to 30 km.
 - Neutralizes jets, helicopters, and cruise missiles.
 - Mounted on mobile platforms to protect moving Army formations.
- **Very Short-Range Air Defence System (VSHORADS):**
 - Man-portable air defence system (MANPADS).
 - Range: up to 6 km.
 - Infrared seeker-based targeting, effective against low-flying UAVs and helicopters.

- **Directed Energy Weapon (DEW):**
 - Laser-based, developed by DRDO's *CHESS (Centre for High Energy Systems and Sciences)*.
 - Neutralizes drones and loitering munitions at very close range.
 - Cost-effective inner-layer defence.
- **Centralised Command and Control Centre (C2C2):**
 - Developed by *DRDL (Defence Research and Development Laboratory)*.
 - Integrates QRSAM, VSHORADS, and DEWs using real-time sensor data.
 - Provides a common operational picture for commanders.

The IADWS represents India's shift towards **indigenous, multi-layered, and technology-driven air defence systems**.

7.4 Golden Dome Missile Defence System:

Why in the news?

The U.S. President unveiled the *Golden Dome Missile Defence System* design and appointed a program head for this \$175 billion project, aimed at shielding the United States from foreign missile threats.

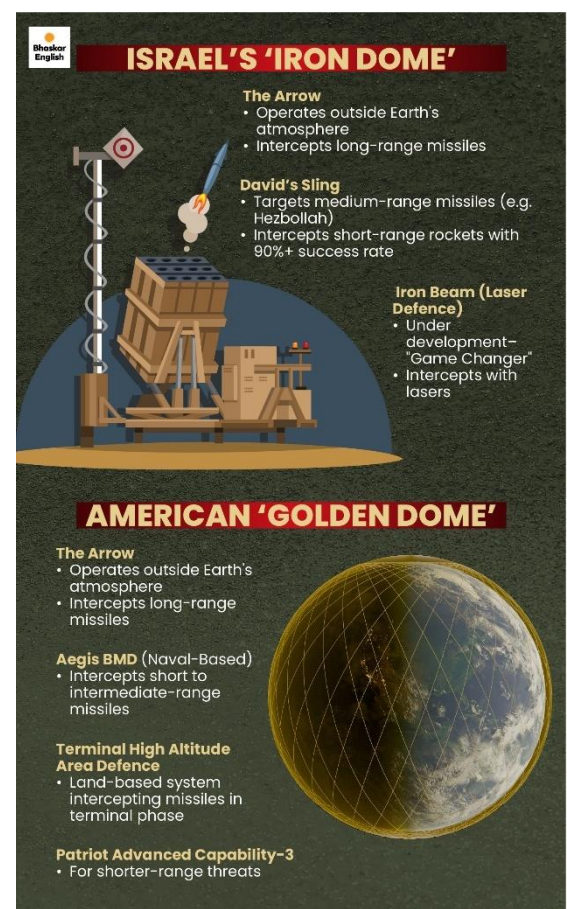
About

The Golden Dome is a next-generation U.S. missile defence program using space-based and land-based intercept layers.

- Envisioned as a technological leap beyond Israel's *Iron Dome* and Ronald Reagan's *Strategic Defence Initiative (SDI)*.
- Provides multi-layered defence across space-based, midcourse, boost-phase, and terminal interception levels.
- Capable of engaging intercontinental ballistic missiles (ICBMs), hypersonic glide vehicles, and cruise missiles.

Characteristic Features

- **Global detection:** Utilizes advanced Hypersonic and Ballistic Tracking Space Sensor satellites.
- **Boost-phase interception:** Hundreds of satellites positioned to track and neutralize missiles early in their flight path using interceptors or directed-energy weapons (lasers).
- Represents a shift towards integrating space-based missile defence into U.S. strategic deterrence.



7.5 Project 17A (P17A)

Why in the news?

Advanced guided-missile frigate *INS Himgiri* has been delivered to the Indian Navy. It is the second ship of the Nilgiri Class under Project 17A.

About

Project 17A (P17A) is a program to build seven advanced, indigenous stealth frigates for the Indian Navy, designed to be more capable and stealthier than the preceding Project 17 Shivalik-class frigates.

- Equipped with supersonic surface-to-surface missiles, medium-range surface-to-air missiles, a 76 mm main gun, and rapid-fire close-in weapon systems (CIWS).
- Incorporates advanced stealth technologies, improved automation, and enhanced survivability features.
- The seven frigates are named after Indian hill ranges: *INS Nilgiri*, *INS Himgiri*, *INS Udaygiri*, *INS Dunagiri*, *INS Taragiri*, *INS Vindhyagiri*, and *INS Mahendragiri*.
- Four frigates are being built by **Mazagon Dock Shipbuilders Ltd. (MDL), Mumbai, and three by Garden Reach Shipbuilders & Engineers (GRSE), Kolkata.**
- These frigates are expected to strengthen India's blue-water capabilities and enhance maritime security in the Indian Ocean Region (IOR).

ARMED FORCES

7.6 Bhairav Commando Battalions

Why in News?

The Indian Army has raised the first five 'Bhairav' commando battalions: three under Northern Command (Leh, Srinagar, Nagrota), one in the western desert, and one in the eastern hilly sector. In total, 23 battalions are planned.

About

- Bhairav Commandos are new light, agile strike forces of ~250 soldiers each, bridging the gap between regular infantry and Para-Special Forces.
- Designed for swift tactical strikes, especially along borders with Pakistan and China.
- Operate on a "save and raise" model – raised from existing infantry units, avoiding fresh recruitment.
- Allow Para-SF to focus on high-risk strategic missions behind enemy lines. Part of Army's larger modernization push that also includes **Rudra Brigades, Shaktibaan Regiments, and Divyastra Batteries.**
 - **Rudra Brigades:** Integrated all-arms formations combining infantry, mechanized forces, Armor, artillery, and special units under one command.
 - **Shaktibaan Regiments:** Specialized artillery units employing drones and loitering munitions for precision "see-and-strike" missions.
 - **Divyastra Batteries:** Advanced artillery batteries combining long-range guns with drone surveillance and targeting technology.

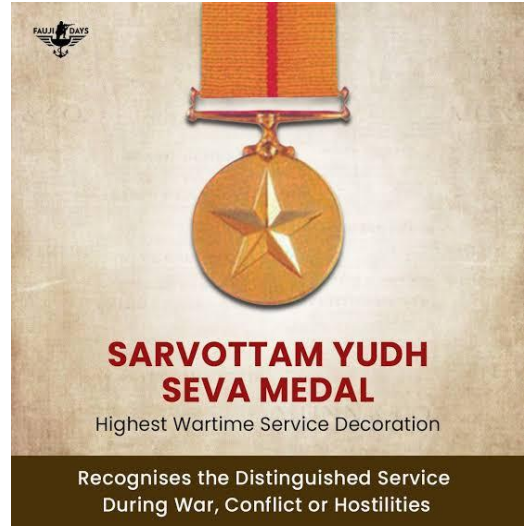
7.7 Sarvottam Yudh Seva Medals (SYSM)

Why in the News?

On the eve of the 79th Independence Day (2025), President Droupadi Murmu awarded seven SYSMs for Operation Sindoor – the first time since the Kargil War that these medals were conferred.

About

- India's highest wartime distinguished service award, instituted in 1980.
- Awarded for “service of the most exceptional order during war, conflict, or hostilities”; may be conferred posthumously.
- Extremely rare – before 2025, only three officers had received it:
 - Lt. Gen Amarjit Singh Kalkat (Operation Pawan, 1989)
 - Air Marshal Vinod Patney (Kargil, 1999)
 - Lt. Gen Hari Mohan Khanna (Kargil, 2000)
- Open to all ranks of Army, Navy, Air Force, Territorial Army, Auxiliary/Reserve Forces, and Nursing Services.



Other Gallantry Awards

- **Param Vir Chakra (PVC):** Highest wartime gallantry award.
- **Ashok Chakra:** Peacetime equivalent; can be awarded to civilians and armed forces.
- **Maha Vir Chakra (MVC):** Second-highest wartime gallantry award.
- **Kirti Chakra:** Peacetime equivalent; can be awarded to civilians/military, also posthumously.
- **Vir Chakra:** Third-highest wartime gallantry award.
- **Shaurya Chakra:** Peacetime equivalent; originally “Ashoka Chakra Class III”; can be posthumous.

JOINT EXERCISES/DRILLS

7.8 Indian Ocean Naval Symposium (IONS)

Why in News?

The ‘Emerging Leaders Panel Discussion’ under IONS was hosted at Southern Naval Command, Kochi, with delegates from 19 member states.

About

- Conceived by Indian Navy in 2008 as a voluntary forum of Indian Ocean littoral states.
- Enhances maritime cooperation and security in IOR; similar to Western Pacific Naval Symposium.

Conclave of Chiefs (CoC): Biennial meeting of naval chiefs; chairmanship rotates every two years.

Working Groups: Focus on areas like Maritime Security (IWG-MARSEC) and HADR.

Membership: 25 states (as of Aug 2025) across four sub-regions:

- **South Asian Littorals:** Bangladesh, India, Maldives, Pakistan, Seychelles, Sri Lanka, UK (BIOT)
- **West Asian Littorals:** Iran, Oman, Qatar, Saudi Arabia, UAE
- **East African Littorals:** France (Reunion), Kenya, Mauritius, Mozambique, South Africa, Tanzania
- **Southeast Asian & Australian Littorals:** Australia, Indonesia, Malaysia, Myanmar, Singapore, Thailand, Timor-Leste

7.9 Exercise Bright Star 2025

Why in News?

Over 700 Indian Armed Forces personnel are participating in Bright Star 2025 in Egypt, showcasing tri-service capability.

About

- Hosted primarily by Egypt and the US; one of the largest multilateral tri-service drills in the MENA region.
- Conducted biennially since 1980.
- Features participation from nations across Asia, Africa, Europe, and the Middle East.
- Provides a platform for interoperability, counter-terrorism training, and showcasing modern joint operations.

7.10 SLINEX-25

Why in News?

SLINEX-25, the **12th edition** of the Sri Lanka–India Naval Exercise was held in **Colombo, Sri Lanka**.

About

- This 12th edition aimed to enhance interoperability, maritime security and growth for all in the region (SAGAR)vision.
- The exercises were conducted in two phases- the exercise featured a **harbour phase** with cultural and professional exchanges, followed by a **sea phase** with advanced naval drills.

8. INTERNATIONAL RELATIONS

8.1 Shanghai Cooperation Organization (SCO)

Why in the news?

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

About

- Established in 2001 at Shanghai and headquartered at Beijing.
- Emerged from the “Shanghai Five” grouping (1996) to have 10 Member States (India, China, Russia, Belarus, Iran, Kazakhstan, Kyrgyz Republic, Pakistan, Tajikistan and Uzbekistan).
- Observers States: Afghanistan, Belarus, Mongolia, Iran (now moving towards full membership).
- Dialogue Partners: Turkey, Sri Lanka, Nepal, Egypt, Saudi Arabia, Qatar.

2025 SCO Summit Highlights (Tianjin, China)

- Theme: “Upholding the Shanghai Spirit: SCO on the Move”.

SCO's important initiatives

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

Focus Areas:

- Adoption of a ten-year development strategy (2025–2035).
- Review of 25 years of SCO achievements.
- Regional security and counter-terrorism cooperation.
- Strengthening trade, energy, and connectivity projects.
- Push for sustainable development and climate action.
- The joint declaration (notably endorsed even by Pakistan) at Tianjin bore an unambiguous strong condemnation against the April 22, Pahalgam terror attack.

8.2 Bay of Bengal Initiative for Multi-sectoral Technical and Economic Cooperation (BIMSTEC)

Why in the news?

- The first-ever BIMSTEC Traditional Music Festival is held in New Delhi
- Theme: "Saptasur: Seven Nations, One Melody"(celebrating unity in diversity through musical traditions).
- Organised by Indian Council for Cultural Relations (ICCR) under Ministry of External Affairs.
- It showcases the rich musical heritage of all seven BIMSTEC countries (Bangladesh, Bhutan, India, Myanmar, Nepal, Sri Lanka, and Thailand).

About

- **The grouping originated with the Bangkok Declaration in June 1997**, when Bangladesh, India, Sri Lanka, and Thailand came together to form BIST-EC.
- Later in December 1997, Myanmar joined, prompting a change in name to BIMST-EC.

- **The organization took on its present title, BIMSTEC, during the First Summit in Bangkok** on 31 July 2004, following the entry of Nepal and Bhutan during the 6th Ministerial Meeting the same year.

Evolution of Areas of Cooperation

- At the outset in 1997, BIMSTEC concentrated on six key sectors: trade, technology, energy, transport, tourism, and fisheries.
- Over time, its scope expanded, and by 2008 the cooperation framework included new areas such as agriculture, public health, poverty alleviation, counter terrorism, environment, cultural exchange, people-to-people connectivity, and climate change.
- India leads the 'security' sector, which comprises of the sub-sectors of Counter-Terrorism and Transnational Crime, Disaster Management and Energy.

8.3 Eurasian Economic Union (EAEU)

Why in the news?

- INDIA and the Eurasian Economic Union (EAEU) signed terms of reference (ToR) marking it as the formal commencement of free trade agreement talks.

About

- The EAEU is an international economic union of five post-Soviet states: Armenia, Belarus, Kazakhstan, Kyrgyzstan & Russia with Observer States: Cuba, Iran, Moldova, and Uzbekistan.
- **Established by a treaty on May 2014** and EAEU officially came into force on January 1, 2015.
- The union is modelled in part after the European Union, with the goal of raising the living standards of its member states and increasing economic cooperation

The union's founding treaty provides for the "four freedoms" within its borders:

1. Goods (Eliminating customs duties and non-tariff barriers),
2. Services (Creating a single market for a wide range of services),
3. Capital (Facilitating investment),
4. Labour (Allowing citizens to work freely throughout the union).

The EAEU is organised and run by several Councils

- **Supreme Eurasian Economic Council:** The highest governing body, comprising the heads of state of the member countries.
- **Eurasian Economic Commission:** The permanent, supranational regulatory body based in Moscow that oversees the union's daily operations.
- **Court of the EAEU:** The judicial body, located in Minsk, that resolves disputes and ensures the uniform application of the EAEU treaty.

8.4 UN Famine Declaration

Why in the news?

The United Nations has declared a famine in Gaza, affecting nearly 500,000 people

About

- 'Famine Declaration' is a formal global classification used by the UN and partners to signal catastrophic food insecurity.
- Integrated Food Security Phase Classification (IPC) framework gives the technical criteria.

A 'Famine Declaration' requires all three thresholds:

1. At least 20% of households face extreme food shortages.
2. Acute malnutrition exceeds 30% in children.
3. The mortality rate is over 2 deaths per 10,000 people per day.

Procedure for Declaration

- Step 1 - Data collection by humanitarian agencies on food security, nutrition, and mortality.
- Step 2 - Technical review by the IPC Global Support Unit.
- Step 3 - Validation by UN agencies such as FAO, WFP, UNICEF, and UN Office for Coordination of Humanitarian Affairs (OCHA).
- Step 4 - Public declaration made jointly by the UN and IPC to alert the world community

8.5 United Nations High Commissioner for Refugees (UNHCR)

Why in the news?

After some returnees were arrested in Sri Lanka for alleged violations of immigration laws. The UNHCR suspended the repatriation of Sri Lankan Tamil refugees from India

About

- UNHCR is a UN agency mandated to protect and support refugees, stateless persons, and internally displaced people worldwide. It promotes durable solutions like voluntary repatriation, local integration, or resettlement in third countries.
- It was **established by the UN General Assembly** in 1950, and operations were started in 1951 with an initial three-year mandate that was later made permanent.
- Organisational Architecture
- **Headed by the United Nations High Commissioner for Refugees** (elected by the UN General Assembly). The UNHCR's Secretariat is led by the High Commissioner (with regional and field offices worldwide).
- **UNHCR's Executive Committee provides policy guidance** (composed of 100 + member states).
- UNHCR's **funding is entirely voluntary** (contributed by governments, private donors, and organisations).

Duties

- Ensure non-refoulement ('no forced return' to a jurisdiction with vulnerability for persecution).
- Facilitate voluntary return or integration.
- Provide shelter, food, health, and education to displaced populations.

8.6 International Regulatory Cooperation for Herbal Medicines (IRCH)

Why in the news?

The Pharmacopoeia Commission for Indian Medicine and Homoeopathy, under the **Ministry of Ayush**, hosted the first session of the **WHO-IRCH Workshops**, conducted in collaboration with the **World Health Organization**.

About IRCH

- Formed in 2006, IRCH functions as a global network connecting regulatory authorities that oversee herbal medicines.
- Its objective is to strengthen cooperation, exchange practices, and support WHO in framing regulatory guidance for member states.
- Membership is available to national bodies that regulate herbal medicines as well as regional or sub-regional organizations with similar roles.

PLACES IN THE NEWS

8.7 Nagorno-Karabakh

Why in the news?

The US President claims to have reached a historic peace deal between Armenia & Azerbaijan.

About

Nagorno-Karabakh is a **mountainous, landlocked region** in the Caucasus, **internationally recognized as part of Azerbaijan** but **historically inhabited by ethnic Armenians**.



8.8 East China Sea

Why in the news?

China rejected Japan's protest over its development of gas fields in the disputed East China Sea, where both nations' Exclusive Economic Zone claims overlap.

About

China and Japan have a conflict in East China Sea over Exclusive Economic Zone (EEZ) and Senkaku Islands.

- **Over EEZ boundaries:** Japan advocates the median line principle, while China claims the continental shelf extending to the Okinawa Trough.
- **Senkaku/Diaoyu islands (Uninhabited islands)** are **administered by Japan** but **claimed by China and Taiwan**.

Disputed claims in the South China Sea

Claims

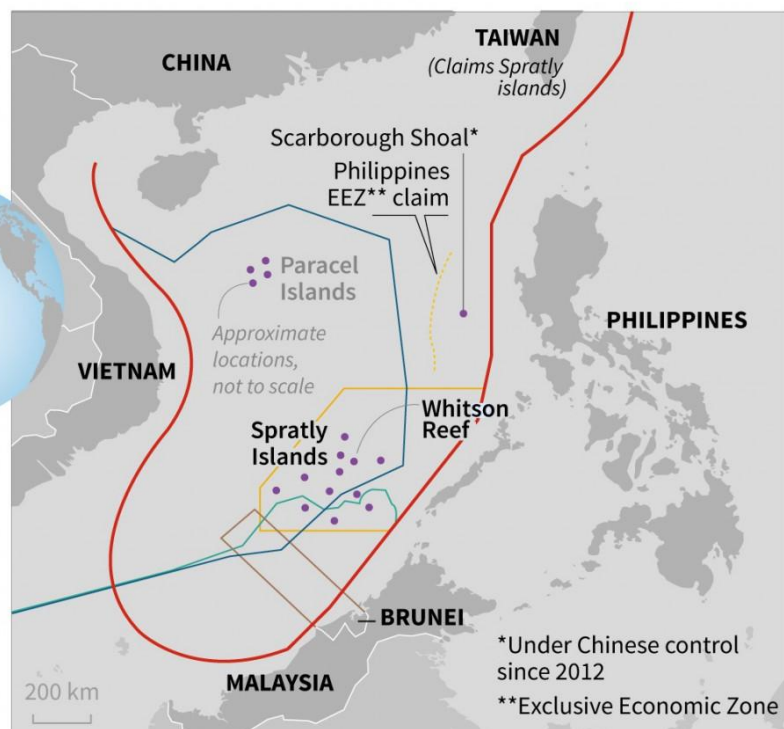
- China
- Philippines
- Malaysia
- Brunei
- Vietnam



Area: South China Sea covers more than 3 million sq km

Trade: Over \$5 trillion in ship-borne trade passes through the sea annually

Oil and gas: Major unexploited oil and gas deposits are believed to lie under the seabed



Sources: CSIS/AMTI/D.Rosenberg/MiddleburyCollege/HarvardAsiaQuarterly/Phil govt/ChinaMaritimeSafetyAdministration



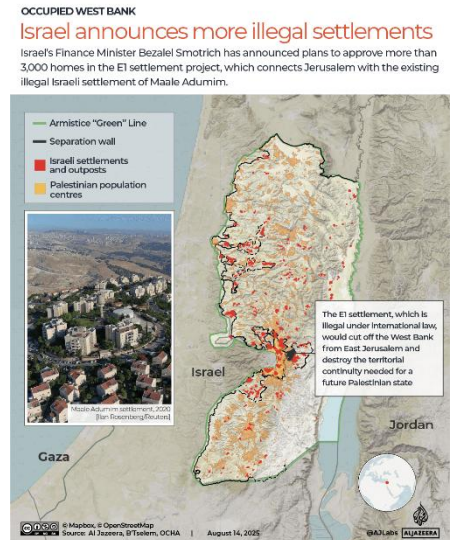
8.9 Israel E1 settlement

Why in the news?

Most of the international community considers Israeli settlements in the West Bank illegal under international law (supported by the International Court of Justice).

About

- The 'E1 settlement' in the West Bank is between Jerusalem and Ma'ale Adumim (Israeli settlement).
- It **disrupts the continuity** between the **northern and southern parts of the West Bank**, thus hindering a viable and contiguous Palestinian state with East Jerusalem as its capital.



8.10 Tato Hydroelectric Projects

Why in the news?

Recently, the Tato-II Hydroelectric Project was inaugurated.

About

- The Tato hydroelectric projects include **two run-of-the-river projects: Tato-I (Yarjep River) and Tato-II (Siyom River) in Shi Yomi district (Arunachal Pradesh)**
- The Yarjep is a tributary of the Siyom River, which is, in turn, a major right-bank tributary of the Siang River (Tributary of Brahmaputra River)
- The **Yarjep** is a smaller river that meets the Siyom River at the village of Tato.



8.11 Daulat Beg Oldie

About

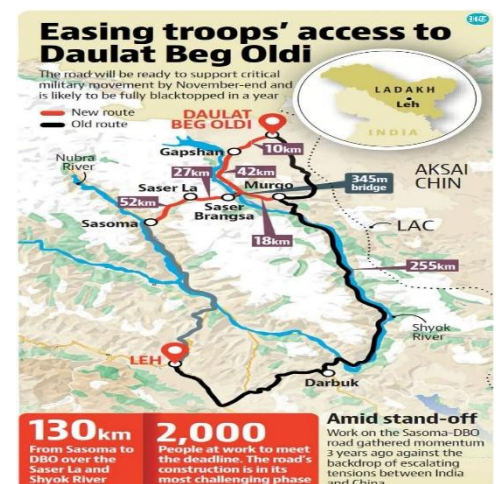
Daulat Beg Oldie (DBO) is a high-altitude military post and airfield in the northern part of Ladakh, India.

- Located in the midst of the **Karakoram Range**, it is of immense strategic significance due to its **proximity to the Line of Actual Control (LAC) with China**.

Why in the news?

A new road is being **built by Border Roads Organisation (BRO) from Sasoma to Daulat Beg Oldie (DBO)** to reduce travel time by approximately 12 hours and **shorten the distance from Leh to DBO by 79 kilometres** (circumventing the **Darbuk-Shyok-Daulat Beg Oldie road**)

- This strategic, 130-km alternate route aims to allow for faster and more discreet movement of troops and heavy military equipment.



9. GOVERNMENT SCHEMES AND PROGRAMMES

9.1 Pradhan Mantri Matru Vandana Yojana(PMMVY)

Why in the news?

Special registration drive for Pradhan Mantri Matru Vandana Yojana extended till August 15

About

- The **Pradhan Mantri Matru Vandana Yojana (PMMVY)** is a Centrally Sponsored Scheme implemented under the *Samarthya* component of **Mission Shakti**.
- PMMVY provides **financial assistance through Direct Benefit Transfer (DBT)** to Pregnant Women and Lactating Mothers (PW&LM). The scheme aims to support nutritious diets, encourage better health-seeking behaviour, and partially compensate for wage loss during pregnancy and post-delivery.
- The scheme is **implemented by States and Union Territories** through **field-level functionaries** using **PMMVYSoft**, a digital platform launched in March 2023. The software ensures **Aadhaar-based authentication via UIDAI** and verification by the **National Payments Corporation of India (NPCI)**, enabling seamless transfer of funds directly into beneficiaries' Aadhaar-seeded bank or post office accounts.

Note:

- MISSION SHAKTI is the Government of India's umbrella programme for **women's empowerment**. Mission Shakti has two sub-schemes: *Sambal* for ensuring **safety and security**, and *Samarthya* for promoting **empowerment and support**.

9.2 UNNATI (Upgrading Norms for Nutrition, Growth, and Development Assessment of Indian Children)

Why in the news?

In a bid to move away from the World Health Organisation (WHO) charts designed for Western populations, the Government of India, with the ICMR, is framing its first-ever India-specific growth and development standards for children.

About

- UNNATI is a growth chart initiative developed by the Government of India in collaboration with the **Indian Council of Medical Research (ICMR)**. It is designed to establish **India-specific growth standards** that reflect the unique characteristics of the Indian population.
- Unlike global benchmarks, UNNATI takes into account India's distinct **"thin-fat" phenotype** and regional variations in growth patterns. The chart aims to provide a more accurate tool for assessing child growth and nutrition in the country.
- In addition to tracking physical growth, UNNATI also monitors key **neurodevelopmental milestones**, such as cognitive, motor, and social skills, ensuring a holistic view of child development.

Objectives

- Establish **national benchmarks** for growth and developmental milestones in healthy Indian children from **birth to 24 months**.
- Create **specific growth curves** for small-for-gestational-age (SGA) babies.

- Enable **timely and accurate assessments** by medical professionals and parents, supporting early interventions for both **malnutrition** and the growing challenge of **childhood obesity**.

9.3 Pradhan Mantri National Dialysis Programme (PMNDP)

About

- The **Pradhan Mantri National Dialysis Programme (PMNDP)** is a flagship initiative under the **National Health Mission (NHM)**.
- It was launched to provide **free dialysis services** to economically vulnerable patients suffering from **end-stage renal disease (ESRD)**.

Implementation

- The scheme is being implemented through a combination of **Public-Private Partnership (PPP)** and **hybrid models**, ensuring wider access and efficient delivery of services.

Coverage

- As of now, the programme has been **expanded to 751 districts** across all **36 States and Union Territories**, making dialysis care more accessible to patients nationwide.

9.4 Adi Karmayogi initiative

Why in the news?

First Regional Process Lab launched in July 2025 & subsequent labs were established in August 2025 across multiple locations.

About

- The **Ministry of Tribal Affairs** launched the Adi Karmayogi initiative, also known as **Dharti Aba Janjatiya Gram Utkarsh Abhiyaan**, to ensure **last-mile delivery** of government schemes to tribal communities.
- It emphasizes **participatory planning and community-driven** development through structured leadership and training.

Vision and Goals

- Each of the **one lakh target villages** will prepare a "**Village Vision 2030**" document, outlining collective goals and aspirations for long-term development.

Leadership Structure

A three-tiered network of leaders has been created:

- **Adi Karmayogis:** Government officials across different administrative levels.
- **Adi Sahyogis:** Professionals such as teachers, doctors, and motivated youth.
- **Adi Saathis:** Grassroots leaders like SHG members, elders, and community influencers.

Training and Support

The initiative includes multi-level training through **Process Labs**, the establishment of **Adi Seva Kendras, Governance Lab Workshops**, and the **Adi Karmayogi Portal** to promote collaboration, capacity building, and a bottom-up development model.

9.5 Pradhan Mantri Janjatiya Unnat Gram Abhiyan (PM JUGA)

Why in the news?

The Ministry of Tourism has issued guidelines along with a template for the formulation of proposals by State Governments and UT Administrations for 'Development of Homestays in Tribal Areas' under Pradhan Mantri Janjatiya Unnat Gram Abhiyan (PM-JUGA).

About

Launched on **October 2, 2024**, PM-JUGA is a centrally sponsored scheme that will run for **five years (2024–25 to 2028–29)**. The program focuses on ensuring **saturation coverage of essential amenities** for tribal families, particularly in:

- **Tribal-majority villages**
- **Villages within aspirational districts and blocks** with significant Scheduled Tribe populations

Implementation Approach

PM-JUGA relies on **25 interventions across 17 ministries**, addressing both basic needs and long-term empowerment. Key areas include:

- **Infrastructure Development:** Pucca houses, piped water through Jal Jeevan Mission, and electricity under the RDSS.
- **Education and Health:** Access to quality schools and healthcare, with a strong focus on combating **Sickle Cell Disease**.
- **Economic Empowerment:** Promoting self-reliance through Skill India, Jan Shikshan Sansthan, homestay tourism, and Tribal Multipurpose Marketing Centres.
- **Land and Livelihood Security:** Helping **Forest Rights Act title holders** secure land rights, along with support for agriculture, animal husbandry, and fisheries.

9.6 Atal Innovation Mission 2.0 (AIM2.0)

About

The Union Cabinet approved the continuation of the **Atal Innovation Mission (AIM)** in **November 2024**, extending it until **March 31, 2028**. AIM, originally set up under NITI Aayog, is now entering its second phase—**AIM 2.0**—with a focus on deepening and expanding India's innovation ecosystem.

Key Initiatives under AIM 2.0

- **Language Inclusive Program of Innovation (LIPI):** Plans to establish vernacular innovation centres in all 22 scheduled languages to support innovators who are not proficient in English.
- **Frontier Program:** Aims to set up **2,500 new Atal Tinkering Labs**, particularly in underserved regions, enhancing inclusivity and outreach.
- **Research Sandbox:** Provides support for the commercialisation of **deep-tech startups**, which require long investment cycles and patient capital.

Why in the News?

Recently, **AIM (NITI Aayog)**, in collaboration with **Bhashini** (Digital India Bhashini Division under the Ministry of Electronics and Information Technology), signed a **Statement of Intent** to foster vernacular innovation and promote language inclusivity.

9.7 PM eDrive

About

The **PM eDrive Scheme**, launched by the **Ministry of Heavy Industries (MHI)**, builds upon earlier initiatives such as **FAME-I**, **FAME-II**, and the **Electric Mobility Promotion Scheme (EMPS) 2024**. Initially designed to run until **March 2026**, the scheme focuses on accelerating the adoption of electric vehicles and strengthening EV-related infrastructure.

Key Components

- **Project Management Agency (PMA):** A central body established to oversee and coordinate the implementation of the scheme.

- **Subsidies for Electric Vehicles:** Demand incentives offered for categories including electric two-wheelers (e-2W), three-wheelers (e-3W), ambulances, trucks, and other emerging EV categories.
- **Grants for Capital Assets:** Financial support aimed at:
 - Procurement of **electric buses (e-buses)**.
 - Establishment of a nationwide **EV charging station network**.
 - Upgradation of testing facilities under MHI to meet future requirements.

Why in the News?

The government has **extended the scheme till March 31, 2028**, but with a narrower focus. Extensions will apply only to **e-trucks, e-buses, e-ambulances, and EV charging infrastructure**. Meanwhile, subsidies for **e-2W, e-3W, and e-rickshaws/carts** will conclude as originally planned in **March 2026**.

9.8 Vibrant Villages Programme (VVP)

About

The **Vibrant Villages Programme (VVP)** is a **Centrally Sponsored Scheme** focused on the comprehensive development of villages located along India's international land borders. It seeks to address both developmental and strategic needs in these remote and sensitive areas.

Key Objectives

The programme aims to:

- Enhance living conditions and generate livelihood opportunities for border populations.
- Involve local residents as valuable partners and observers in supporting national security forces.
- Promote **inclusive and sustainable development** in remote tribal and border villages.
- Counter challenges arising from neighbouring countries' border infrastructure development.

Features

- **Growth Model:** Uses a "**Hub and Spoke**" approach to establish regional growth centres, drive social entrepreneurship, promote tourism, and encourage sustainable agribusiness.
- **Village Action Plans:** Comprehensive **Vibrant Village Action Plans** are prepared by district administrations with active participation of Gram Panchayats.
- **Technology Integration:** Tools like the **PM Gati Shakti Portal** are used for real-time project monitoring and efficient implementation.
- **Local Economic Focus:** Encourages "**One Village, One Product**" initiatives to promote sustainable eco-agribusiness and localised economic development.

9.9 JATAN scheme

About

The **JATAN Scheme (JATAN: Virtual Museum Builder)** is an initiative of the **Ministry of Culture** aimed at creating **3D virtual galleries** and **digital representations** of museum collections.

Key Features

- The digital collections generated through JATAN are **integrated into a national digital repository**, providing a **single online platform** for public access to museum collections across India.

- The scheme has been **implemented in several national and state museums**, ensuring a **standardised digital collection management system** for preserving and showcasing India's cultural heritage.
- **C-DAC Pune** provides the technical expertise for both the development and maintenance of the JATAN platform and the national museum portal.

9.10 One Nation, One Subscription (ONOS) Scheme

Why in the news?

The **Delhi High Court** recently ordered a ban on **Sci-Hub** and its mirror sites following a copyright case filed by global publishers. This has reignited debates around access to research papers in India and highlighted the role of the government's ONOS scheme.

About

The **ONOS Scheme**, launched in **2024**, seeks to provide **universal and legal access to research material** across India, reducing dependence on piracy. Its approach involves negotiating **bulk agreements with 30 major publishers**, thereby offering access to over **13,000 journals**.

- **Phase I:** Access extended to **public universities and institutions**.
- **Phase II:** Expansion planned to include **private institutes and colleges**.

About Sci-Hub

- Founded in **2011**, Sci-Hub is a free online repository hosting millions of research papers.
- It bypasses journal paywalls, providing unrestricted access to academic material without formal subscriptions.
- It is widely used by students, researchers, and independent scholars in developing countries to overcome high subscription costs.
- **The Case Outcome:** The **Delhi High Court** directed Internet Service Providers to block Sci-Hub and its portals, raising questions about balancing copyright protection with equitable access to knowledge

9.11 Swachh Shehar Jodi (SSJ) guidelines: "Each One, Teach One" approach.

About

The **Swachh Shehar Jodi (SSJ)** initiative follows an "**Each One, Teach One**" mentorship approach. Under this model, **72 high-performing cities** from the **Swachh Survekshan 2024-25 awards** are paired with **72 lower-performing cities** within the same state.

Objectives

The programme is designed to strengthen the institutional capacity of **urban local bodies**, particularly in key areas such as:

- **Solid Waste Management**
- **Legacy Waste Management**, including remediation of old dumpsites
- **Waste Processing**, with special focus on setting up **Compressed Bio-Gas (CBG) plants**

IMPORTANT REPORTS AND INDICES

9.12 Unified District Information System for Education Plus (UDISE+)

Why in the news?

The **Ministry of Education** released the latest **UDISE+ report**, highlighting key trends in India's school education scenario for 2024-25.

About

UDISE+ is an **annual nationwide survey** that tracks data on infrastructure, enrolment, teachers, training, digital readiness, health, and learning environment across government, aided, and private schools.

Key Highlights (2024–25)

- In 2024–25, school enrolment data revealed some worrying and contrasting trends. The number of students aged **3–11 years** (covering anganwadis, pre-schools, and Classes I to V) fell by nearly **25 lakhs** compared to the previous year. This decline is largely attributed to **demographic shifts caused by falling birth rates** as well as the movement of children into **standalone private pre-primary institutions**.
- Overall school enrolment from **Classes I to XII** also dropped by around **11 lakh students** compared to 2023–24, marking the **lowest levels since 2018–19**. Alarming, some states such as **Ladakh, Arunachal Pradesh, and Uttarakhand** reported the presence of **zero-enrolment schools**.
- On a more positive note, **dropout rates showed significant improvement**. Between 2023–24 and 2024–25, dropout rates fell from **3.7% to 2.3%** at the preparatory stage, from **5.2% to 3.5%** in middle school, and from **10.9% to 8.2%** in secondary school.
- However, the report highlighted stark **infrastructure disparities** across states. While **Kerala and Tamil Nadu** have achieved near-universal access to school toilets and internet facilities, states like **Meghalaya and Jharkhand** continue to lag. The **digital divide** is also evident between **private schools (77.1% with internet access)** and **government schools (58.6%)**.

Note:

The Ministry officials have given a disclaimer that the **2022–23 and 2023–24 reports are not strictly comparable with previous years** due to a change in the methodology of data collection, where **2011 Census data was used for calculating parameters like the Gross Enrolment Ratio (GER)**.

9.13 THE NARI 2025: National Annual Report and Index on Women's Safety

Why in the News?

The National Commission for Women (NCW) released the National Annual Report and Index on Women's Safety (NARI 2025), assessing women's safety perceptions and crime data across Indian cities.

About

- The report combines **survey-level data** with **National Crime Records Bureau (NCRB)** statistics to evaluate urban safety.
- **Top-ranked cities** (higher perceived safety): Kohima, Visakhapatnam, and Bhubaneswar.
- **Bottom-ranked cities**: Patna, Jaipur, Faridabad, Delhi, Kolkata, Srinagar, and Ranchi.
- **Key findings**: 44% of women in Ranchi felt unsafe, while Delhi and Faridabad reported $\approx 42\%$.

9.14 Climate Change and Workplace Heat Stress Report

Why in the News?

A joint WHO-WMO report highlights the severe impact of rising global temperatures on occupational health and productivity, with 2024 recorded as the warmest year (1.45°C above pre-industrial levels).

About

- **Risks:** Extreme heat causes heatstroke, kidney dysfunction, and neurological disorders, affecting nearly half the global workforce.
- **Focus:** Urgent need for policies to protect outdoor and indoor workers from escalating heat stress.

9.15 SHRESTH (State Health Regulatory Excellence Index)

Why in the News?

The Union Ministry of Health & Family Welfare launched SHRESTH, the first national index to benchmark state drug regulatory systems.

About

- **Developed by:** Central Drugs Standard Control Organisation (CDSCO).
- **Purpose:** A virtual gap assessment tool to evaluate, rank, and improve state drug regulatory authorities using monthly data submissions.
- **Evaluation Criteria:**
 - **Manufacturing States:** 27 indicators across 5 themes (Human Resources, Infrastructure, Licensing, Surveillance, and Responsiveness).
 - **Distribution States/UTs:** 23 indicators under the same themes.

9.16 Framework for Responsible and Ethical Enablement of Artificial Intelligence (FREE-AI) in the financial sector.

Why in the News?

The RBI released the FREE-AI framework, prescribing guidelines for ethical AI adoption in the financial sector.

About

- **Committee:** Headed by Dr. Pushpak Bhattacharyya.
- **Framework:** Based on 7 guiding "sutras" and 26 recommendations across 6 pillars, balancing innovation enablement and risk mitigation.

9.17 State Energy Efficiency Index (SEEI)2024

Why in the News?

The Ministry of Power released SEEI 2024, with Maharashtra, Andhra Pradesh, Assam, and Tripura as top-performing states.

About

- **Developed by:** Bureau of Energy Efficiency (BEE) and Alliance for an Energy Efficient Economy (AEEE).
- **Scope:** Assesses 36 States/UTs on energy efficiency for FY 2023-24.
- **Performance Categories:** Front Runners (>60%), Achievers (50-60%), Contenders (30-50%), Aspirants (<30%).
- **Key Feature:** Sixth edition includes 66 implementation-focused indicators covering Buildings, Industry, Transport, Agriculture, DISCOMs, and Cross-Sector initiatives (e.g., EV policies, star-rated buildings).
- **Note:** All 36 States/UTs have prepared State Energy Efficiency Action Plans (SEEAPs).

9.18 India Electric Mobility Index

Why in the News?

NITI Aayog introduced the India Electric Mobility Index (IEMI) in August 2025 alongside a report titled "Unlocking a \$200 Billion Opportunity: Electric Vehicles in India".

About

Purpose: Tracks and benchmarks progress of states/UTs on a 100-point scale using 16 indicators across three themes:

1. Transport Electrification Progress
2. Charging Infrastructure Readiness
3. EV Research and Innovation Status

Categories: States classified as Frontrunners, Performers, or Aspirants based on scores.

Top Performers

- **Overall Frontrunners:**
 - Delhi (Rank 1): Strong local policies, high EV adoption (especially 2W/3W segments)
 - Maharashtra (Rank 2): Comprehensive EV policies, manufacturing hubs, and extensive charging network
 - Chandigarh (Rank 3): Incentives for women buying e-2Ws, scores well across all themes
- **Category Leaders:**
 - Transport Electrification: Delhi, Maharashtra, Chandigarh
 - Charging Infrastructure: Haryana, Karnataka, Ladakh, Himachal Pradesh (Karnataka leads)

9.20 Global Artificial Intelligence (AI) City Index 2025

Why in the News?

Bengaluru ranked 26th globally in the 2025 AI City Index by Counterpoint Research, cementing its position as India's top AI R&D and data centre hub.

About

- **Publisher:** Market research firm Counterpoint Research
- **Indian Rankings:**
 - Bengaluru: Leads in AI research, innovation, and infrastructure
 - Mumbai & Delhi: Focus on AI applications in traffic management and public security
 - Other Cities: Chennai and Kolkata also feature in national top ranks
- **Key Challenges:** Need for stronger AI roadmaps and regulatory frameworks in India
- **Global Top 3:** Singapore, Seoul, Beijing

IMPORTANT LEGISLATIONS

9.21 National Sports Governance Act, 2025

Why in News?

The Indian government has enacted a comprehensive law to replace the ad-hoc governance of sports bodies with a stringent, legally binding framework. This act aims to ensure transparency, accountability, and athlete welfare across all nationally recognized sports federations, including the BCCI.

Key Provisions of the Act

1. New Administrative Bodies:

- **National Sports Board (NSB):** A central government-established body to **oversee and regulate all recognized National Sports Federations (NSFs)**.
- **National Sports Tribunal (NST):** A dedicated judicial body to provide speedy resolution of **sports-related disputes** (e.g., elections, athlete selection, governance issues). It explicitly **excludes jurisdiction over doping disputes**, which remain with NADA.
- **National Sports Election Panel:** Comprising retired election officials, this panel will **supervise and ensure free and fair elections** within the executive committees of all sports bodies.

2. Enhanced Governance & Accountability:

- **RTI Applicability:** All recognised sports organisations **receiving government funding** will be subject to the Right to Information (RTI) Act, 2005.
- **Use of National Emblems:** Federations must obtain a **No-Objection Certificate (NOC)** from the central government and the NSB before using 'India' or national insignia.
- **Audit by CAG:** The **Comptroller and Auditor General of India (CAG)** is empowered to conduct regular audits of these bodies.

3. Athlete-Centric Reforms:

- **Inclusive Committees:** Mandates the inclusion of **outstanding sportspersons and women** in the executive committees of sports bodies.
- **Safe Sports Policy:** Compulsory adoption of a policy to **safeguard women, minors, and vulnerable athletes** from harassment and abuse.
- **Athlete Welfare:** Establishes a **comprehensive framework for the welfare of sportspersons**.

4. Specific Impact on BCCI:

- The BCCI is now **mandated to seek recognition from the NSB**, bringing it under the act's regulatory purview.

However, an amendment **exempts the BCCI from RTI obligations** as it does not receive government funds.

9.21 The Promotion and Regulation of Online Gaming Act, 2025

Why in the News?

The government has enacted a comprehensive law to regulate the online gaming sector, promoting legitimate e-sports while imposing a complete ban on all forms of online real-money gaming.

About

The Act establishes a new regulatory framework with the following key provisions:

- **Categorisation:** Classifies online games into four types: **e-sports, social games, educational games, and online money games**.
- **Promotion:** Actively encourages e-sports, social, and educational games. **E-sports** will be recognized and supported as a legitimate competitive sport.
- **Regulator:** Creates an **"Online Gaming Authority"** for sector oversight.
- **Ban on Real-Money Gaming:** Imposes a **complete ban** on all online money games, ignoring the skill vs. chance distinction. Authorities can **block access** to unlawful gaming apps.

- **Penalties:** Targets intermediaries—**service providers, advertisers, and payment processors**—facilitating banned games. **Players are exempt** from penalties.
- **Stringent Offences:** Violations are **cognizable** (allowing arrest without a warrant) and **non-bailable**.

Legal Immunity: Protects officials from legal action for steps taken in **good faith**.

9.22 National Anti-Doping (Amendment) Act, 2025

Why in the News?

This amendment strengthens India's anti-doping legal framework by enhancing the autonomy of its agencies and ensuring full alignment with the latest World Anti-Doping Agency (WADA) standards.

About

The act amends the National Anti-Doping Act, 2022, with the following objectives:

- **Operational Independence:** Grants greater institutional and operational autonomy to the **National Anti-Doping Agency (NADA)** and the **National Anti-Doping Appeal Panel**.
- **International Alignment:** Brings domestic regulations in line with the **UNESCO International Convention against Doping in Sport** and the latest **WADA Code**.
- **Laboratory Standards:** Mandates all dope-testing labs in India to obtain and maintain **WADA accreditation**. Requires NADA to verify that adverse findings are not due to procedural deviations.
- **Clearer Violations:** Provides a comprehensive list of actions constituting anti-doping rule violations.
- **Updated Definitions:** Introduces and modifies key terms (e.g., "**Marker**", "**Metabolite**") to align with the WADA Code.
- **Oversight:** Empowers the **National Board for Anti-Doping in Sports** to obtain operational details from disciplinary and appeal panels.

9.23 Coastal Shipping Act, 2025

Why in the News?

This modern legislation replaces outdated provisions of the Merchant Shipping Act, 1958, aiming to boost domestic coastal cargo share to 230 million metric tonnes by 2030.

About

Key features of the Act include:

- **Licensing Reform:** **Indian vessels** are exempt from requiring a general trading license for coastal operations, while **foreign vessels** must obtain a license.
- **Structured Licensing:** Introduces a transparent process for foreign vessels, considering factors like **national security** and domestic vessel availability.
- **Strategic Planning:** Mandates a **National Coastal and Inland Shipping Strategic Plan**, updated biennially, to guide route planning and infrastructure development.
- **National Database:** Establishes a centralized platform providing real-time information on licenses, routes, and compliance.
- **Stricter Penalties:** Imposes fines and vessel detention for violations like operating without a license or providing false information.
- **Private Investment:** Expands eligibility for chartering vessels to attract private sector participation.

DOMESTIC BODIES/INSTITUTIONS IN NEWS

9.24 Central Consumer Protection Authority (CCPA)

Why in News?

The **Central Consumer Protection Authority (CCPA)** has imposed a **₹10 lakh penalty on Rapido** for misleading advertisements promising “Auto in 5 min or get ₹50.”

About

- Established in **July 2020** under the **Consumer Protection Act, 2019**, to **protect and enforce consumer rights** and curb **misleading ads and unfair trade practices**.
- Structure:**
 - Headed by a **Chief Commissioner**, assisted by **two Commissioners** (one each for goods and services).
 - Investigation Wing** (headed by Director-General) conducts inquiries and collects evidence.
 - Supported by a **regional and district network** of consumer helplines and grievance redress systems.
- Role:** Acts **on behalf of consumers as a class**, while consumer redress for individual grievances is provided by the **three-tier Consumer Commissions** (District, State, National).



9.25 National Institute of Animal Biotechnology (NIAB)

Why in News?

The **National Institute of Animal Biotechnology (NIAB)**, Hyderabad has inaugurated **India's first Animal Stem Cell Biobank and Laboratory**.

- Developed with support from the **National Biopharma Mission (NBM)** under **DBT-BIRAC**, this facility will allow **biobanking of animal stem cells and derivatives** for research and conservation.

About

- Established:** 2010 as an **autonomous research institution** under the **Department of Biotechnology (DBT)**.
- Mandate:** To provide **sustainable, technology-driven solutions** for animal health, husbandry, and bio-entrepreneurship.
- Key Achievements:**
 - Recognised as a **Central Drugs Laboratory (CDL)** – enabling faster testing and release of vaccine batches in India.
 - Developed **India's first cattle genomic chip** to aid in **conservation of indigenous breeds** and improving livestock productivity.

9.26 Higher Education Commission of India (HECI)

Why in News?

The government has announced the establishment of the **Higher Education Commission of India (HECI)** to replace **UGC, AICTE, and NCTE** with a **unified, technology-driven regulator** for higher education.

About

The **HECI** aims to transform India's higher education landscape by:

- Shifting from **input-based** to **outcome-based governance**.
- Granting **greater institutional autonomy** with **stronger accountability mechanisms**.
- Integrating **AI, blockchain, and predictive analytics** into quality assurance.
- Making India a **global education hub by 2030**.

Structure – Four Verticals:

1. **National Higher Education Regulatory Council (NHERC):** Unified approval and oversight.
2. **National Accreditation Council (NAC):** Outcome-focused quality assurance.
3. **Higher Education Grants Council (HEGC):** Performance-linked funding.
4. **General Education Council (GEC):** Curriculum modernisation with global compatibility.

Key Initiatives:

- **National Education Intelligence Platform:** AI-powered dashboard system for monitoring quality at national, regional, and institutional levels.
- **Regional Education Excellence Centres:** Six semi-autonomous hubs for regional-level capacity building and oversight.

10. MISCELLANEOUS

10.1 Great Nicobar Project

Why in News?

The **Tribal Council of Great Nicobar** has alleged that **forest rights of Nicobarese tribals** under the **Forest Rights Act (FRA), 2006** were not settled before land was diverted for the Great Nicobar Project.

- A **legal conflict** exists between **FRA, 2006** and the **Protection of Aboriginal Tribes Regulation (PAT), 1956**.
- **PAT, 1956** allows land diversion without Gram Sabha consent, whereas **FRA, 2006** makes Gram Sabha consent and settlement of rights mandatory before diversion.

About

A **strategic mega-infrastructure project** first conceptualised in **2015** and granted full clearances in **2022**. Implemented by **NITI Aayog** and **A&N Administration** with **Government of India's strategic backing** to enhance connectivity and maritime security

Key Components:

- **Transshipment Port** at **Galathea Bay** for international cargo movement.
- **International Airport** (dual civil–military use).
- **Gas-based Power Plant** for reliable energy supply.
- **Integrated Township** with housing and social amenities.
- **13,000+ hectares of forest land** to be diverted.

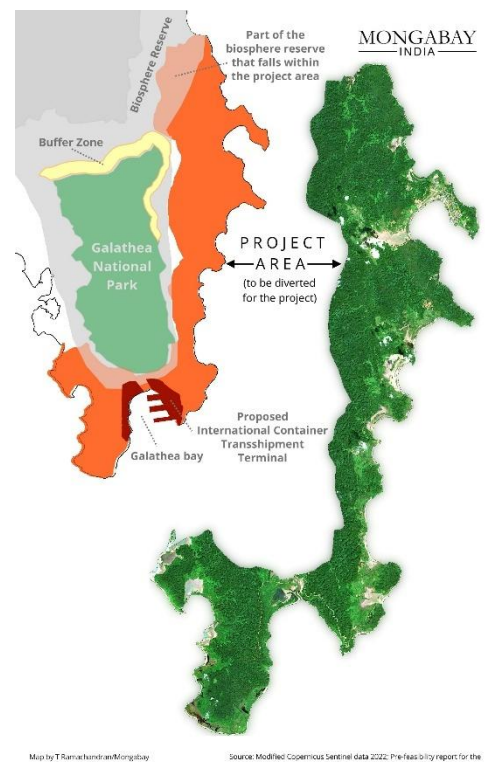
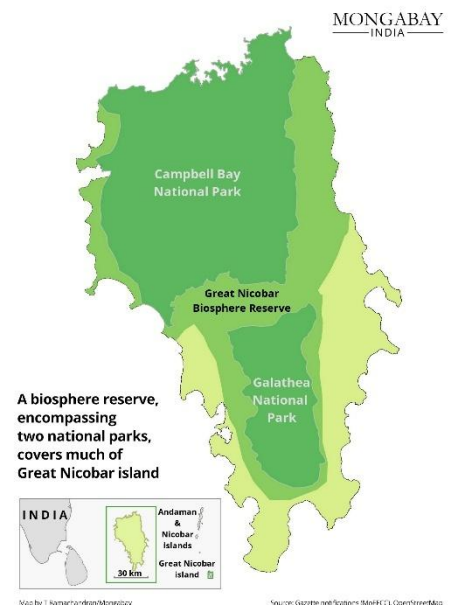
Key Legal Provisions

Forest Rights Act (FRA), 2006

- Grants **individual and community rights** to Scheduled Tribes and traditional forest dwellers over forest land and produce (habitation, cultivation, grazing, fishing, minor forest produce).
- **Mandatory Gram Sabha consent** before forest diversion for non-forest use.

Protection of Aboriginal Tribes Regulation (PAT), 1956

- Protects land and forest rights of tribes such as **Nicobarese, Shompens, Onges**.
- **Bars outsiders** from settling or acquiring land in tribal reserves.
- Gives **A&N Administrator powers** to permit land diversion for projects, sometimes overriding Gram Sabha consent.



10.2 Toda Tribe

Why in News?

The **Toda tribe** of the **Nilgiri Hills** is spearheading efforts to preserve **India's endangered languages** under the **Scheme for Protection and Preservation of Endangered Languages (SPPEL)**, implemented by the **Central Institute of Indian Languages (CIIL)**, Ministry of Education.

- The project aims to **document, digitise, and promote literacy** in the Toda language using the **Tamil script**.

About

The **Todas** are a **pastoral tribal community** of the **Nilgiris (Tamil Nadu)**.

- Speak the **Toda language** — a **proto-South-Dravidian tongue** with no native script.
- Recognised as a **Scheduled Tribe** in Tamil Nadu and classified as a **Particularly Vulnerable Tribal Group (PVTG)**.
- Known for distinctive **barrel-vaulted huts, embroidered shawls (pukhoor), and buffalo-based economy**

10.3 Census 2027

Why in News?

The **Registrar-General of India (RGI)** has written to all **State Directorates of Census Operations** directing that the **urban area definition of Census 2011** be retained for **Census 2027** to ensure **comparability of data** and better analysis of **urbanisation trends**.

- States have been instructed to review **villages with a population of 4,000+ in Census 2011**, as many are expected to cross the **5,000-population threshold** by 2027 and may qualify as **census towns**.

About

Census 2027 will be India's **first digital census**, conducted in **two phases**:

- **Phase 1:** House-listing & Housing Schedule – begins **April 2026**
- **Phase 2:** Population Enumeration – in **February 2027**

Key Features:

- **First post-independence census** to enumerate **caste beyond SCs and STs**.
- Retains **urban area definition** from 2011 for consistency.
- **Administrative boundaries** across India to be frozen on **January 1, 2026**, and all **statutory towns** as on that date will form the **urban frame**.

Urban Area Classification

- **Statutory Towns:** Notified by state/UT governments; have a local governance body (municipality, corporation, cantonment board, nagar panchayat, etc.).
- **Census Towns:** Areas that meet **urban demographic criteria** but still governed by a rural framework.
 - **Census 2011 definition:** Population $\geq 5,000$, Density ≥ 400 persons/sq. km, $\geq 75\%$ male main workers in non-agricultural activities.

Pre-Test for Census 2027

- Conducted in two phases to test **questions, methodology, training, logistics, printing processes, and data quality** before the final roll-out.

National Population Register (NPR)

- **No decision yet** on updating NPR during Census 2027.
- **NPR:** Database of “usual residents” created in **2010** during Census 2011 Phase 1; updated in **2015-16**, covering **119 crore residents**.
- NPR is the **first step toward NRC** as per **Citizenship Rules, 2003** under **Citizenship Act, 1955**.

10.3 Registration of Births & Deaths

Why in News?

The **Registrar General of India (RGI)** has urged all States/UTs to work towards **universal registration of births and deaths**, ensuring 100% coverage under the **Registration of Births and Deaths Act, 1969**.

About

- Under the Act, **hospitals must report births and deaths within 21 days**.
- The **2023 amendment** made **online registration mandatory** through the **RGI portal**.
- Earlier, States maintained separate databases and only shared data with RGI.
- The **centralised database** can now be used for updating **electoral rolls, NPR, and ration cards**.
- From **1 October 2023**, a **digital birth certificate** serves as the **single proof of date of birth** for services such as school admission, government jobs, and marriage registration.

Registrar General of India (RGI)

The RGI is the **head of the Office of the Registrar General**, functioning under the **Ministry of Home Affairs** and serving as the **ex-officio Census Commissioner of India**.

Key Responsibilities:

- **Census of India:** Conducts the **decennial census** covering demographic, cultural, and socio-economic data.
- **Civil Registration System (CRS):** Oversees **compulsory registration of births & deaths** under the 1969 Act.
- **Sample Registration System (SRS):** Conducts surveys to estimate **birth rate, death rate, IMR, MMR**.
- **National Population Register (NPR):** Maintains database of **usual residents** of the country.
- **Linguistic Survey of India:** Documents and preserves **India’s linguistic diversity**.

10.4 Daruma Doll

About

A **Daruma doll** is a **traditional Japanese hollow, round, and limbless doll** inspired by **Bodhidharma** - the Indian monk from **Kancheepuram** who founded the **Zen school of Buddhism** in Japan (known there as *Daruma Daishi*).

- Represents **Bodhidharma’s nine-year meditation**, which, according to legend, led to the loss of his limbs — hence the doll’s round, limbless form.
- Its **weighted base** allows it to **return upright when tipped**, symbolising perseverance and resilience.

