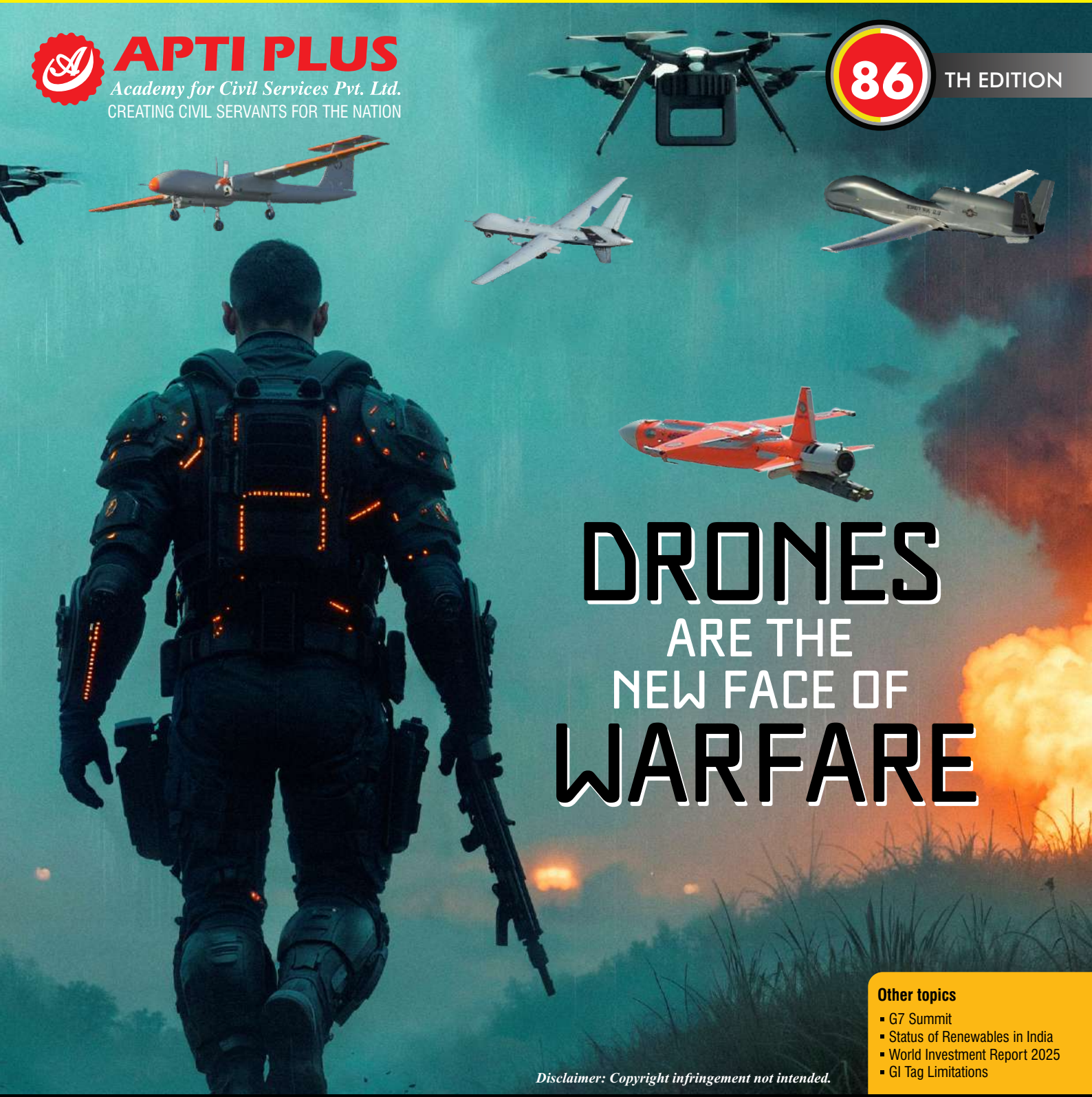
THE IAS GAZETTE

A House Journal of **APTI PLUS**

JULY 2025



APTI PLUS
Academy for Civil Services Pvt. Ltd.
CREATING CIVIL SERVANTS FOR THE NATION

86 TH EDITION

DRONES ARE THE NEW FACE OF WARFARE

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- G7 Summit
- Status of Renewables in India
- World Investment Report 2025
- GI Tag Limitations

A **MONTHLY PERIODICAL** FOR ASPIRANTS OF UPSC CSE

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1.1 SHORT ARTICLES

Samarth

Context

- The Centre for Development of Telematics (C-DOT) operating under the Department of Telecommunications (DoT), Ministry of Communications & Information Technology, launched the "Samarth" program.

About 'Samarth' Program

- It is an **incubation program that provides comprehensive support to startups and innovators**, by establishing a supportive ecosystem for emerging companies to develop and scale their business models.
- **Implementation Partners:** To enhance its reach and effectiveness, C-DOT has partnered with the Software Technology Parks of India (STPI) and The Indus Entrepreneurs (TiE). This collaboration combines expertise in technology, mentorship and industry networking.
- **Target Sectors:** The program focuses on startups working in critical and emerging technology areas. These include:
  - 5G and 6G technologies
  - Cybersecurity
  - Artificial Intelligence (AI)
  - Internet of Things (IoT)
  - Quantum Technologies
  - General Telecom Applications

Key Features and Benefits for Startups

- **Financial Assistance:** Each selected startup receives a grant of up to ₹5 lakh to support its initial operations and development.
- **Office Space:** Startups gain access to fully furnished office space for a period of six months at C-DOT's modern campuses in Delhi and Bengaluru.
- **Mentorship and Expertise:** Guidance from C-DOT's technologists and a network of external experts and industry leaders.
- **Networking Opportunities:** Connects startups with a strong network of investors, industry leaders and potential collaborators.
- Successful startups may also receive opportunities for further collaboration and funding under the C-DOT Collaborative Research Program (CCRP).

Banakacherla Project

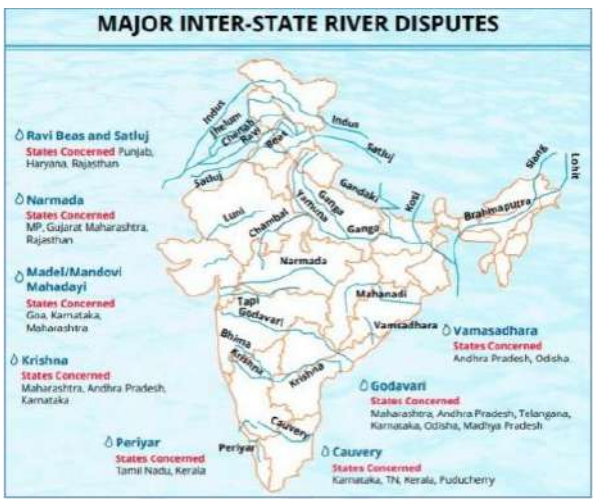
Context

- A water dispute has emerged between Andhra Pradesh and Telangana over the Banakacherla reservoir project.

What is the Banakacherla Reservoir Project?

It is an initiative by Andhra Pradesh (AP) to divert **"surplus" Godavari River water** to the drought-prone **Rayalaseema region** via the Krishna and Penna rivers. Key components include:

- A **Bollapalli reservoir** and **31-km tunnel** through the **Nallamala forests** will channel water to Banakacherla.



Why is Telangana opposing the project?

Telangana alleges **three major violations**:

- **Legal breach** => The project lacks approvals from the **Krishna/Godavari River Management Boards (KRMB/GRMB)** and the **Central Water Commission (CWC)**, violating the **AP Reorganization Act, 2014**.

- **Threat to water share** => The **Godavari Water Disputes Tribunal** allocated **968 TMCft to Telangana** but left **"surplus water" undefined**. Diversions could jeopardize Telangana's irrigation projects like **Kaleshwaram Lift Scheme**.
- **Ecological risks** =>Tunneling through **Nallamala forests** may disrupt **tiger corridors, groundwater systems** and tribal livelihoods.

What are the root causes of interstate water disputes in India?

- **Federal-jurisdictional ambiguity**: The Constitution places **interstate rivers under the Centre (Entry 56, Union List)** but **water utilization under states (Entry 17, State List)**, leading to conflicts.
- **Historical baggage**: State boundaries (e.g., **AP's 2014 bifurcation**) ignore **river basin unity**, complicating water-sharing pact.
- **Political opportunism**: Parties exploit water disputes for votes.
- **Data gaps**: No real-time monitoring of **"surplus water"** or basin-wide usage fuels distrust.

What solutions exist to resolve such disputes?

- **Strengthen KRMB/GRMB**: Empower these boards with **enforcement authority** and **technical staff**.
- **River Basin Management**: Implement the **River Boards Act, 1956** for holistic planning.
- **Water-efficient agriculture**: Shift from **paddy** to **millets** in Rayalaseema to cut demand.
- **Political dialogue**: Revive **Apex Council meetings** with neutral mediators.

Why Investigators cannot Summon Lawyers

Context

- The Supreme Court ruled that investigators cannot summon lawyers for advice given to clients, this upholds the principle of attorney-client privilege.

What is attorney-client privilege?

Attorney-client privilege is a **statutory right** under **Section 132 of the Bharatiya Sakshya Adhiniyam (BSA), 2023** (formerly Section 126 of the Indian Evidence Act, 1872). It ensures:

- All communications between a lawyer and client remain private, including **oral advice, documents and electronic exchanges**.
- Clients can disclose sensitive information **without fear of exposure**, enabling lawyers to provide accurate legal counsel.
- Courts have ruled that violating this privilege **undermines the legal profession's independence** and the administration of justice.

What are the exceptions to attorney-client privilege?

Section 132 of the BSA allows disclosure **only in three scenarios**:

- **Client Consent:** The client explicitly waives confidentiality.
- **Illegal Purpose**: Advice sought to commit **fraud or crime** (e.g., tax evasion, money laundering).
- **Observed Crime:** The lawyer witnesses **ongoing criminal activity** by the client post-engagement.

> The Supreme Court in **Smriti Lavanya C v/S Vittal Gurudas Pai (2025)** held that lawyers **cannot disclose client instructions** even under pressure.

What did the Supreme Court rule about summoning lawyers?

- **No Direct Summons**: Investigative agencies (e.g., CBI, ED, police) **cannot summon lawyers** to question them about client advice .
- **Judicial Oversight Needed**: Even if a lawyer's role extends beyond advice (e.g., witness), agencies must seek **court approval** before summoning them.
- **Threat to Justice:** Allowing such summons would **chill free legal counsel** and erode public trust in the legal system.

ECI New Rules on EVMs

Context

- The Election Commission of India (ECI) has issued a revised Standard Operating Procedure (SOP) for the post-election verification of Electronic Voting Machines (EVMs).

Background

- Civil society groups, most notably the Association for Democratic Reforms (ADR), filed a petition in the Supreme Court. They demanded 100% counting of Voter Verified Paper Audit Trail (VVPAT) slips, to ensure that every vote cast on an EVM is correctly recorded on paper.
- In April 2024, the Supreme Court rejected the plea for 100% VVPAT counting, however, to strengthen confidence in the system, it introduced a new mechanism.
- The Court ruled that candidates ending in second and third place possess the right to request a verification of the "burnt memory" or microcontroller of up to 5% of the EVMs (including the Control Unit, Ballot Unit and VVPAT) in their constituency after the results are declared.

Initial SOP and Petitioner Objections

Following the Supreme Court's order, the ECI formulated an SOP in June 2024, however, petitioners raised two main objections:

- **Deletion of Data:** ECI's verification process involved deleting the poll data from the EVM's memory; this action defeated the purpose of a genuine post-mortem check.
- **Exclusion of the Symbol Loading Unit (SLU):** The SLU is a device that loads the names and symbols of candidates onto the VVPAT machine before the election. Activists asserted that any meaningful verification process must include an examination of the SLU to ensure the correct symbols were loaded and that no tampering occurred at this stage.

> In February 2025, the Supreme Court ordered the ECI not to delete the poll data during verification and to amend its SOP to include the SLU in the process. In June 2025, the ECI released a revised SOP.

Highlights of the Revised SOP

- Previously, a candidate had to pay a flat fee of ₹47,200 for each EVM set they wished to check. The new rule introduces a two-tier system:
  - **₹23,600:** This fee applies for a preliminary "self-diagnostic test" of the machine.
  - **₹47,200 (full fee):** Candidates only pay this full fee if they decide to proceed to a full mock poll after the diagnostic test. This makes the initial step more affordable for candidates.
- **Inclusion of the Symbol Loading Unit (SLU):** Offers the requesting candidate the option to use data from the actual SLUs used in the election to conduct the mock poll. This allows for a more authentic recreation of the polling day setup, addressing a key concern of petitioners.
- **Longer Data Retention:** The records of the verification process, including the VVPAT slips and video footage, will now be stored for three months.

Performance Grading Index (PGI) 2.0

Context

- The Ministry of Education has released the 2023-24 Performance Grading Index (PGI) 2.0 report.

About Performance Grading Index (PGI) 2.0

- It evaluates the performance of school education systems across all States and Union Territories.
- It was **first launched in 2017 and updated to PGI 2.0 in 2021** to align with the National Education Policy (NEP) 2020 and Sustainable Development Goals.
- The aim of the PGI is to promote evidence-based policymaking and encourage states to enhance learning outcomes by identifying areas for improvement.

Assessment Framework

- The PGI 2.0 framework **evaluates states and UTs based on a total of 1,000 points across 73 indicators**. These indicators are grouped into two main categories: Outcomes and Governance & Management.
  - These categories are divided into six key domains: Learning Outcomes & Quality, Access, Infrastructure & Facilities, Equity,

Governance Processes, Teacher Education & Training

- Data for these indicators is sourced from multiple platforms. These include the Unified District Information System for Education Plus (UDISE+), the National Achievement Survey (NAS) of 2021 and the PM-POSHAN portal.
- States and UTs are assigned to one of 10 grades based on their scores. The highest grade is 'Daksh' (941-1000) and the lowest is 'Akanshi-3' (401-460).

Highlights of the 2023-24 PGI 2.0 Report

- **Overall Performance Trends:** 24 states and UTs have shown improvement in their scores compared to the previous year. However, 12 and UTs have experienced a decline in their performance. No state or UT has managed to secure a score above 760, which places none in the top grade bands.
- **Best Performer:** Chandigarh stands as the sole entity in the 'Prachesta-1' grade, achieving a score of 719.
- **Lowest Performer:** Meghalaya ranks at the bottom of the index with a score of 417, falling into the 'Akanshi-3' category.

Index Cards

Context

- The Election Commission of India (ECI) upgraded its mechanism for generating Index Cards.

What is an Index Card?

- An Index Card is a comprehensive, non-statutory statistical report created after an election.
- The ECI creates Index Cards to make detailed electoral data readily accessible to researchers, academics, policymakers and the public for analysis and study. The data compiled in these Index Cards forms the basis for several official statistical reports.
- Index Cards serve as a secondary data summary specifically for academic and research purposes. The primary and legally final data remains in statutory forms, such as Form 17C (Register of Voters) and Form 20 (Result of Counting), which the respective Returning Officers maintain.

Challenges with the Previous System

- After an election, officials manually filled data onto physical Index Cards using information from various statutory forms. This manually entered data then had to be manually inputted into an online system.
- The manual entry and cross-verification process was extremely slow, leading to considerable delays in data availability.
- Manual data entry at multiple stages increased the chances of clerical mistakes and inaccuracies.
- Researchers and policymakers experienced long waits to access crucial election data, hindering timely analysis and decision-making.
- The process required significant manpower and considerable logistical effort, making it inefficient.

New Mechanism

- The new system utilizes automation and data integration to directly pull electoral data from existing digital systems where statutory information is already logged. This eliminates the need for manual data entry from physical forms.
- Instead of manual entry, the system automatically populates the Index Card by integrating data on various critical parameters, including:
  - **Elector Details:** Total electors, as well as specific counts for male, female and third-gender electors.
  - **Votes Polled and Turnout**: Data on the total votes polled and the corresponding voter turnout percentages.
  - **Candidate and Party Vote Shares:** Detailed breakdown of vote shares for individual candidates and political parties.
  - **Party Performance Analysis**: Analysis of the performance of National, State and Registered Unrecognised Political Parties (RUPPs).
  - **Winning and Runner-up Candidates**: Comprehensive analysis of winning

candidates and their immediate runners-up.

Battery Aadhar

Context

- Tata Elxsi has unveiled Battery Aadhaar, a blockchain-based digital identity system designed to enhance battery traceability and sustainability.

What is Battery Aadhaar?

- Battery Aadhaar is a d**igital identity system for batteries, conceptually similar to the Aadhaar system for Indian citizens.**
- It assigns a unique digital ID to each battery, enabling the tracking of its entire lifecycle, from manufacturing to eventual recycling.
- Tata Elxsi, a Tata Group company, launched this initiative at the Battery Summit 2025. The World Resources Institute (WRI) India organized the summit in collaboration with Tata Motors, IIT Kharagpur and the Indian government.
- The United Nations Environment Programme (UNEP) also supported the initiative through its "Electrifying Mobility in Cities" program, coordinated by NITI Aayog and the Department of Science & Technology.

Significance of Battery Aadhaar

- Batteries, especially those used in electric vehicles, are crucial for transition towards clean energy and sustainable mobility. However, improper handling, unsafe reuse, or poor disposal of batteries harm the environment and violate regulatory standards. Battery Aadhaar addresses these issues by ensuring transparency and accountability across the entire battery ecosystem.

How Battery Aadhaar Functions?

- The Battery Aadhaar initiative leverages Tata Elxsi's MOBIUS+ platform, which operates on blockchain technology, which provides a secure, tamper-proof digital ledger, ensuring the integrity and immutability of recorded data.
- **Assigns a Digital Identity =>** Each battery receives a unique digital ID. This ID stores comprehensive details, including:
    - Manufacturer information.
    - Battery chemistry and contained materials.
    - Its usage history throughout its operational life.
    - Relevant safety certifications.
    - Performance data over time.
- **Tracks the Battery's Life Cycle =>** From the sourcing of raw materials to the battery's recycling or repurposing, Battery Aadhaar monitors every step. This continuous tracking prevents misuse or unsafe disposal of any battery.
- **Prevents Unsafe Reuse =>**By tracking usage history, the system prevents the unsafe reuse of old or damaged batteries in applications where they could pose a danger, such as in low-quality products.
- **Supports Sustainability =>** The system promotes responsible recycling and facilitates second-life applications for batteries (e.g., repurposing used EV batteries for grid energy storage). This approach reduces waste and minimizes environmental harm, fostering a circular economy for batteries.

DHRUVA

Context

- The Department of Posts has launched DHRUVA—Digital Hub for Reference and Unique Virtual Address.

About DHRUVA Policy

- DHRUVA builds on the foundation of the Digital Postal Index Number (DIGIPIN), which is a geo-coded addressing system integrated into India's National Addressing Grid.
- The primary goal of DHRUVA is to **make various public and private services, including governance, e-**

> The six-digit PIN code introduced in 1972, has served postal services well but struggles to meet the demands of modern digital services. E-commerce, food delivery, emergency response and government welfare schemes require highly exact locations.

commerce and emergency response, faster, more accurate and more efficient by providing precise location information.

How DHRUVA Works?

- DHRUVA introduces an "Address-as-a-Service (AaaS)" model, a system where addresses are managed digitally, shared securely and updated effortlessly.
- DIGIPIN, the **fundamental backbone of DHRUVA, assigns a unique 10-character alphanumeric code** (e.g., 4J7P2K9W3X) to every specific location based on its precise latitude and longitude coordinates. Unlike traditional PIN codes that cover broad geographical areas, DIGIPIN can pinpoint individual homes or businesses. This feature is particularly valuable in rural areas, informal settlements (slums), or hilly regions where convectional addresses are often unclear or non-existent.
- The DHRUVA platform is **designed to be mobile-first and supports multiple Indian languages, making it accessible to a wide demographic**, from urban technology enthusiasts to rural farmers. It integrates with Aadhaar for seamless identity verification, adding another layer of convenience and security.

Sugamya Bharat App

Context

- The Ministry of Social Justice & Empowerment has revamped the Sugamya Bharat App (SBA).

What is the Sugamya Bharat App?

The Department of Empowerment of Persons with Disabilities (DEPwD) launched the **Sugamya Bharat App (SBA)** in 2021 as a **crowdsourcing tool** to identify accessibility barriers. The app allows users to:

- **Report issues**: Upload geo-tagged photos of inaccessible infrastructure (e.g., buildings without ramps, broken elevators).
- **Trigger action**: Authorities receive automated alerts and must resolve complaints within 30 days (as per 2025 guidelines).
- **Access resources**: Get information on disability schemes like the **National Fellowship for Divyangjan** and **accessible transport routes**.

The app enforces two critical mandates:

- **Rights of Persons with Disabilities Act, 2016 =>**This Act replaced the Persons with Disabilities Act of 1995 and mandates equal opportunities and non-discrimination for persons with disabilities.
- **UN Convention on the Rights of Persons with Disabilities (UNCRPD) =>** India is a signatory to this convention since 2007.

What major upgrades were introduced in the 2025 version?

- **AI Chatbot "Sugamya Mitra" =>**Supports **12 Indian languages** and voice commands. Guides users through disability certificate applications and grievance redressal.
- **Priority Tagging =>**Auto-classifies complaints as **P1 (life-threatening) to P3 (minor)**. Example: A blocked wheelchair ramp at a hospital gets **P1** status, triggering immediate action.
- **Real-Time Tracking =>**Users monitor complaint resolution on a dashboard. Escalates unresolved issues to state disability commissioners after 15 days.

Scheme to promote manufacturing of Electric Passenger Cars in India" (SPMEPCI)

Context

- The Ministry of Heavy Industries has notified the "Scheme to Promote Manufacturing of Electric Passenger Cars in India", to attract global Electric Vehicle (EV) manufacturers to invest in India.

Highlights of the New EV Manufacturing Policy

- **Reduced Customs Duty:** Reduces the customs duty on imported, completely built-up (CBU) electric passenger cars. It slashes the current rate of 70-100% to a concessional rate of 15%. This reduced duty applies to vehicles with a minimum CIF (Cost, Insurance and Freight) value of $35,000.

- **Investment Mandate:** To qualify for the duty concession, foreign manufacturers must commit to a minimum investment of ₹4,150 crore in India over three years.
- **Localization Targets:** Policy mandates a phased increase in local sourcing. Companies must achieve 25% Domestic Value Addition (DVA) within three years and ramp it up to 50% within five years of receiving approval.
- **Import Caps:** Benefit of the reduced duty is limited. A maximum of 8,000 EVs can be imported per manufacturer annually. The total duty foregone is capped at ₹6,484 crore or the actual investment, whichever amount is lower.

Significance

- **Attracting Global Players:** Previous high import duties acted as a major deterrent for global EV companies like Tesla. The new policy creates a more attractive entry point for such global leaders to invest and establish manufacturing operations in India.
- **Boosting 'Make in India':** By directly linking tax benefits to local manufacturing and value addition, the scheme promotes the establishment and growth of a domestic EV production ecosystem within the country.
- **Technology Transfer:** Policy aims to promote the transfer of modern EV technology to India, which is essential for the long-term competitiveness and advancement of the domestic industry.
- **Achieving Climate Goals:** Promoting the adoption and manufacturing of Electric Vehicles is central to India's commitment to reduce its carbon footprint and achieve its Net Zero emissions target by 2070. The policy directly supports these national climate objectives.

Umeed

Context

- The Union Government introduces the 'Umeed' portal, to digitize and centralize Waqf property registrations.

What is Waqf?

- Waqf, deeply rooted in Islamic law, represents an unchanging charitable endowment. Here, an individual, known as the 'Waqif', permanently dedicates a property for religious or charitable purposes.
- **Property once designated as Waqf, cannot be sold, gifted, or mortgaged.** The income and resources generated from these properties serve the welfare of the community, which includes funding and operating essential services such as schools, hospitals and orphanages, as well as providing direct support to the economically disadvantaged.
- **The Waqf Act 1995, governs these endowments**, to establish the legal framework for their creation, management and protection, through the Central Waqf Council and various State Waqf Boards.

About 'Umeed' Portal

- **Mandatory Registration:** All Waqf properties must undergo registration on the 'Umeed' portal. The respective State Waqf Boards are responsible for supervising and executing this registration process.
- **Strict deadline of six months from the portal's launch** for the completion of all property registrations.
- Registration requires comprehensive descriptions of each property, including its precise dimensions and its geotagged location, to ensure accurate and verifiable records.
- Properties that fail to register within the specified timeframe, face declaration as 'disputed'. Authorities then refer these unresolved cases to the Waqf Tribunal for official resolution.

FASTag Annual Pass Scheme

Context

- The Union Minister of Road Transport and Highways introduced the FASTag Annual Pass scheme.

About the FASTag Annual Pass Scheme

- The pass costs a flat fee of ₹3,000 for the year 2025-26. It remains valid for one year from its

activation date or for 200 trips, whichever comes first.

- **It allows private, non-commercial vehicles like cars, jeeps, or vans** to pass through toll plazas on National Highways (NH) and National Expressways (NE) without paying a fee for each trip.

FASTag

- It is an electronic toll collection system, mandatory for all vehicles on national highways from December 15, 2019, operated by the National Highways Authority of India (NHAI).
- It employs Radio Frequency Identification (RFID) technology for making toll payments directly from the prepaid or savings account linked to it or directly toll owner.
- It is affixed on the windscreen of the vehicle and enables one to drive through toll plazas without stopping for transactions.

Activation and Management

- Users can **activate the pass through the Rajmargyatra mobile application** or the official National Highways Authority of India (NHAI) website.
- **Individuals do not need to purchase a new FASTag.** They can activate the annual pass on their existing, valid FASTag.
- For point-based toll plazas, **each crossing counts as a single trip, while a round trip counts as two trips.**
- Once the 200-trip limit is reached or the one-year validity expires, the pass automatically reverts to a regular FASTag. Users can then repurchase the annual pass if they wish.
- The Ministry has indicated that the ₹3,000 fee may be revised annually, with any changes taking effect from April 1st of each year.

Limitations of the Annual Pass

- **Central Government Highways Only:** The Annual Pass is valid only at fee plazas on National Highways and National Expressways managed by the central government.
- **State Highways Excluded:** It is not valid on expressways or state highways managed by state governments or other local bodies. On these routes, the FASTag will function normally and the applicable toll charges will be deducted as usual.

1.2 SNIPPETS

Topics	Details
Gender Budgeting Knowledge Hub	• The Union Ministry of Women and Child Development has launched the 'Gender Budgeting Knowledge Hub', a digital portal that provides a comprehensive repository of information and tools related to Gender Budgeting. • Gender Budgeting is a powerful fiscal tool and a core component of Gender Responsive Budgeting (GRB), a mechanism to track, analyze and re-prioritize public expenditure from a gender perspective. • India formally **adopted Gender Budgeting in 2005-06 and** every year, the Ministry of Finance issues a budget circular directing all ministries to report the quantity of public expenditure earmarked for women.
NAVYA Initiative	• Government has launched the Nurturing Aspirations through Vocational Training for Young Adolescent Girls (NAVYA). • It is a **joint initiative between the Ministry of Women and Child Development (MWCD) and the Ministry of Skill Development and Entrepreneurship (MSDE).** • It targets adolescent girls aged 16-18 who have completed at least Class 10, in Aspirational and tribal districts, helping them establish small businesses after training. ○ The Aspirational Districts Programme (ADP) was launched in 2018, aims to

	transform 112 of the most underdeveloped districts in the country by focusing on convergence, collaboration and competition. • Girls identified by the MWCD will receive short-term skill development courses under the Pradhan Mantri Kaushal Vikas Yojana (PMKVY) and PM Vishwakarma Yojana. • The training will focus on various skills, including graphic design, telecom and financial services, smartphone and drone assembly, solar PV and CCTV installation and hand embroidery.
Bhasini	• The Ministry of Panchayati Raj (MoPR) has signed a Memorandum of Understanding (MoU) with the Bhashini, to eliminate language barriers in rural governance • BHASHINI (BHASHaINterface for India) is an **AI-powered language translation platform, launched in July 2022, as part of the Digital India initiative.** • It aims to make digital content and services available in all major Indian languages by building a vast ecosystem of AI and Natural Language Processing (NLP) tools for speech-to-text, text-to-text translation and more. • The initiative **operates under the National Language Technology Mission (NLTM) and is managed by the Ministry of Electronics and Information Technology (MeitY).** • Recent developments include the Open Network for Digital Commerce (ONDC) launching "Saarthi," an application that uses Bhashini to help businesses create multilingual buyer-side apps.
Gyan Post	• The Department of Posts has launched Gyan Post, a postal service offering affordable delivery of educational, cultural, social and religious books. • Gyan Post service **aims to make printed educational materials more accessible and affordable for individuals across India**, with a special focus on remote and rural areas. • It offers a highly subsidized rate for book delivery, with a minimum charge of ₹20 for packets weighing up to 300 grams and a maximum charge of ₹100 for packets up to 5 kilograms. • The service is **exclusively for non-commercial printed educational, social, religious, or cultural content and** materials from recognized educational boards, universities and statutory institutions are eligible.
C CARES Version 2.0 Portal	• The Ministry of Coal has launched C-CARES Version 2.0. • C-CARES 2.0 is an **integrated platform that brings coal workers, their employers and** the Coal Mines Provident Fund Organisation (CMPFO) onto a single platform. • It facilitates online claim submission and real-time tracking of status, empowering workers by providing visibility into the entire process. • The platform automates processes like ledger updates and enables direct benefit transfers (DBT) of provident fund and pension amounts directly into the bank accounts of the workers. • **Established in 1948**, the CMPFO administers provident fund and pension schemes for workers in the coal sector, currently serving about 3.3 lakh provident fund subscribers and 6.3 lakh pensioners.
Yashoda AI	• The National Commission for Women (NCW) launches Yashoda AI to boost women's AI literacy and cybersecurity skills across India. • The **initiative targets women, particularly from rural and semi-urban areas**, to help them become confident users and leaders in the digital future. • The campaign uses a community-driven approach, with workshops and training

	organized in schools, colleges and community centers across India. • Women trained under the program become AI Sakhis, teaching others in their communities, creating a network of digitally empowered women. • It focuses on practical skills, such as cybercrime protection, digital privacy and using AI tools for real-world tasks.
DIGIPIN	• The Department of Posts has launched two digital platforms, 'Know Your DIGIPIN' and 'Know Your PIN Code', to improve digital addressing and geospatial governance. • The Digital Postal Index Number (DIGIPIN) is **an open-source, geo-coded addressing system that uses a 10-character alphanumeric code to pinpoint a specific 4x4 meter location anywhere in India.** • The portal allows users to find their DIGIPIN by entering their exact location using GPS or GNSS technology and input latitude and longitude coordinates to get a DIGIPIN or vice versa. • The **Department of Posts also conducts a nationwide geofencing exercise to improve the precision of the six-digit PIN Code system**, which organizes postal delivery by assigning codes to geographic areas.
BharatGen	• The Union Minister of State (Independent Charge) for Science & Technology launched 'BharatGen'. • BharatGen is **India's first indigenously developed, government-funded Multimodal Large Language Model (LLM)** designed for Indian languages. • It **supports 22 Indian languages**, integrating text, speech and image processing • The initiative operates under the National Mission on Interdisciplinary Cyber-Physical Systems (NM-ICPS), led by the Indian Institute of Technology (IIT) Bombay. The **Department of Science and Technology (DST) provides support to the project**.
Training of Trainers (TOT) Programme	• The Ministry of Panchayati Raj (MoPR) launched the Training of Trainers (ToT) program. • The program **launched in collaboration with the Indian Institute of Management (IIM) Ahmedabad**, aims to empower Panchayats to become financially self-reliant or 'Atmanirbhar Panchayats' by generating their Own Source Revenue (OSR). • The ToT program is a **centrally sponsored scheme under the Rashtriya Gram Swaraj Abhiyan (RGSA),** which employs a "train the trainer" model. • The training covers topics such as strategic revenue enhancement methods, innovative financing mechanisms and revenue planning and project management for Gram Panchayat Development Plans (GPDPs). • The Ministry is also developing a Model OSR Rules framework and a Digital Tax Collection Portal to create a supportive revenue generation ecosystem.
Vineet Joshi Panel	• The Ministry of Education has formed a nine-member panel led by Union Higher Education Secretary Vineet Joshi • The panel's terms of reference include **analyzing gaps in schooling, tackling 'dummy schools', reviewing entrance exams, examining coaching center practices**, assessing the demand for higher education and strengthening career counseling. • It will examine the advertising and marketing strategies of coaching centers, analyze the imbalance between high demand for quality higher education and limited seats in premier institutions and evaluate the effectiveness of career guidance services in schools. • The panel's goal is to **address the growing concerns about the overshadowing of the formal schooling system by a parallel coaching industry.**

National Florence Nightingale Awards 2025	• President Droupadi Murmu honors 15 nurses with the 2025 National Florence Nightingale Awards at Rashtrapati Bhavan. • The National Florence Nightingale Awards are a recognition for nurses who have made significant contributions to healthcare. • **Established in 1973 by the Ministry of Health and Family Welfare,** these awards recognize nurses who demonstrate remarkable dedication, compassion and service to society. • The awards include a Certificate of Merit, a cash prize of Rs. 1,00,000 and a medal. • Florence Nightingale, born in 1820, revolutionized nursing by establishing the Nightingale School of Nursing at St. Thomas' Hospital in London in 1860, the world's first secular, science-based nursing school. • The International Committee of the Red Cross established the Florence Nightingale Medal in 1912, awarded every two years to nurses for exceptional courage or innovation in public health.
Ayush Suraksha Portal	• The Union Government has launched the Ayush Suraksha Portal to monitor misleading ads and adverse drug reactions in traditional medicine. • The portal allows anyone to report misleading ads or harmful side effects directly on the portal, making it user-friendly and accessible. • The system tracks complaints in real-time, allowing quick action against false claims or unsafe products. • It connects multiple bodies like the Central Drugs Standard Control Organisation, Ministry of Information and Broadcasting, Central Consumer Protection Authority and State Licensing Authorities for a unified response. • The **Central Council for Research in Siddha (CCRS) provided technical support,** aligning the portal with the National Pharmacovigilance Program.

1.3 ADDITIONAL TOPICS FOR READING FROM IASGYAN WEBSITE

Topic Name	Date
EMERGENCY AND ITS LESSONS	27th June, 2025
THE NEED FOR GENDER EQUITY IN URBAN BUREAUCRACY	27th June, 2025
PM GRAM SADAK YOJANA	24th June, 2025
HOW INDIA CONDUCTS ITS CENSUS – AND WHAT IS NEW IN 2027	18th June, 2025
FUNDS ALLOTTED FOR POOR PRISONERS REMAIN UNUSED	9th June, 2025
NITI AAYOG AND A DEEPENING FEDERALISM	6th June, 2025
FOREIGN LAW FIRMS IN INDIA	3rd June, 2025

2. INTERNATIONAL RELATIONS

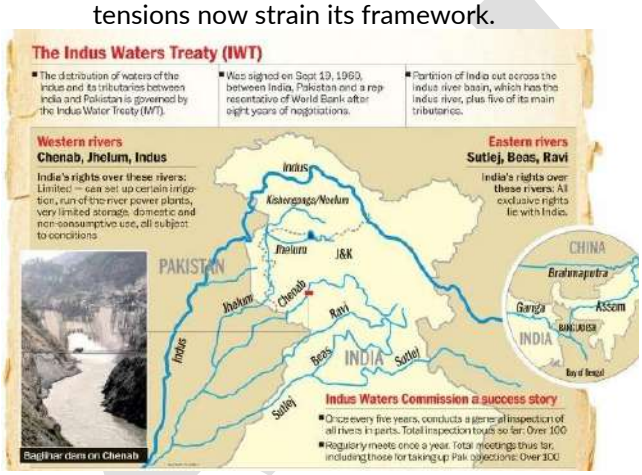
2.1 INDUS TREATY ARBITRATION COURT

Context

- India rejected a Court of Arbitration ruling on the Indus Waters Treaty.

What is the Indus Waters Treaty (IWT)?

- The **Indus Waters Treaty (1960)**, brokered by the **World Bank**, governs water-sharing between India and Pakistan for the **Indus River system**. It allocates:
  - **Eastern rivers (Ravi, Beas, Sutlej):** Full use to India.
  - **Western rivers (Indus, Jhelum, Chenab):** Primarily to Pakistan, but India can use them for **hydropower and limited agriculture** under strict design rules.
  - **Significance:** The treaty survived **three wars** and is hailed as one of the world's most resilient water-sharing pacts. However, climate change and geopolitical tensions now strain its framework.



The IWT has a three-tiered mechanism for resolving disagreements:

- **Permanent Indus Commission (PIC):** The first level of resolution involves the Commissioners from both countries meeting regularly to address technical issues.
- **Neutral Expert:** If the PIC cannot resolve a "difference," either side can request the World Bank to appoint a Neutral Expert to decide on technical matters.
- **Court of Arbitration (CoA):** For "disputes" involving legal interpretations of the treaty, a seven-member Court of Arbitration can be formed.

Disputes over the Kishenganga and Ratle projects

- **Kishenganga (Jhelum tributary)**: Pakistan claims India's **330 MW dam** violates the IWT by **reducing water flow** to Pakistan.
- **Ratle (Chenab River)**: Pakistan objects to the **850 MW project's design**, alleging it **disrupts sediment flow**.
- **India's Counter**: Both projects adhere to IWT's **Annexure D** (technical specifications). Pakistan's shift from **Neutral Expert (2015) to CoA (2016)** breached the treaty's **sequential dispute process**.

Why did India reject the Court of Arbitration's ruling?

- India rejected the **Hague-based Court of Arbitration's (CoA) "Supplemental Award"** (June 2025) for three reasons:
  - **Illegitimate Formation:** India argues the CoA was **unilaterally constituted by Pakistan** without mutual consent, violating Article IX of the IWT, which mandates sequential dispute resolution (PIC → Neutral Expert → CoA).
  - **Sovereignty Concerns:** The CoA attempted to examine India's **suspension of the treaty** after the **Pahalgam terror attack (April 2025)**, which India considers a **sovereign decision** beyond the tribunal's jurisdiction.
  - **Parallel Proceedings:** The World Bank's **2022 decision** to appoint both a **Neutral Expert** (India's request) and a **CoA** (Pakistan's request) created conflicting rulings. India engaged only with the Neutral Expert, calling the CoA a **"charade".**

How has Pakistan responded?

- **Challenged India's Suspension**: Argues the IWT **cannot be unilaterally altered** and warns that blocking water is an **"act of war"**.
- **Pursued Legal Avenues**: Insists the CoA's ruling validates the treaty's **binding nature** and demands India comply.
- **Sought Third-Party Mediation**: Urged the **World Bank** and **China** (upstream stakeholder) to intervene.

What is the way forward for the IWT?

- **Resume PIC Talks**: Restore the **Permanent Indus Commission** for technical dialogue, even amid political tensions.
- **Modernize the Treaty**: Update the IWT to address **climate change**, **groundwater use** and **data-sharing**—issues absent in the 1960 text.
- **Clarify Dispute Resolution**: Codify a **single-track mechanism** to avoid parallel Neutral Expert/CoA deadlocks.
- **Delink Water & Terrorism**: India could **phase treaty resumption** based on Pakistan's **verifiable counter-terror actions**.
- **Regional Cooperation**: Include **China** (controls Indus headwaters) and **Afghanistan** in broader basin management.

2.2 SHORT ARTICLES

UN80 Initiative

Context

- The United Nations launches the UN80 Initiative to modernize the organization.

What is the UN80 Initiative?

- It is a reform agenda launched by UN Secretary-General António Guterres in March 2025 to make the organization more efficient, financially sustainable and better equipped to tackle 21st-century challenges like climate change, inequality and geopolitical instability.

What are the core objectives of UN80?

- **Enhance Efficiency**: Cut bureaucratic red tape, relocate offices to lower-cost locations and reduce redundant posts in overlapping departments.
- **Strengthen Multilateralism**: Restore global trust in the UN by proving its relevance amid rising skepticism toward international institutions.
- **Address Global Challenges**: Strengthen responses to crises like conflicts, displacement and climate shocks.
- **Ensure Financial Sustainability**: Tackle the UN's $2.4 billion budget shortfall, partly caused by unpaid dues (e.g., the U.S. owes $1.5 billion).

It operates through three pillars:

- **Internal Efficiency**: Streamline operations by consolidating HR, finance and procurement services into unified hubs. For example, payroll processing will shift from 10 locations to 3 global centers.
- **Mandate Review**: Use AI to analyze 4,000 active mandates and 40,000 past resolutions, identifying redundancies (e.g., outdated peacekeeping directives).
- **Structural Reform**: Propose mergers, like combining human rights offices into a single "Office for Vulnerable Populations".

What are the major proposals under UN80?

- **Budget Cuts**: A 15–20% reduction in the 2026 budget, including a 20% staff cut, prioritizing senior-level reductions.
- **System-Wide Coordination**: Seven thematic clusters (e.g., peace/security, development) will submit proposals to reduce fragmentation.
- **Counter-Terrorism Reforms:** The EU warns against over-centralizing CT efforts, urging transparency to preserve field expertise.

India refuses to sign SCO Draft Statement

Context

- India refused to sign the joint statement of the Shanghai Cooperation Organisation (SCO) Defence Ministers' meeting in Qingdao, China.

Why did India refuse to sign the SCO joint statement?

- India refused to approve the SCO joint statement because the document ignored its core concerns on cross-border terrorism.
- The draft omitted any reference to the **Pahalgam attack** (April 2025), where 26 civilians, including a Nepali national, were killed by the Lashkar-e-Taiba-linked group.
- However, it highlighted militant activities in Pakistan's Balochistan—a move India viewed as a **false equivalence** and a deliberate attempt to sideline state-sponsored terrorism from Pakistan.
- Defence Minister **Rajnath Singh** explicitly condemned "double standards" and nations that "use terrorism as state policy" without naming Pakistan.
- It discloses the SCO's inability to uniformly define or act against terrorism when member states like China and Pakistan politicize the issue.

The SCO was established in **2001** (evolving from the 1996 Shanghai Five) to combat the "three evils": **terrorism, separatism and extremism**. Its **Regional Anti-Terrorist Structure (RATS)** in Tashkent coordinates intelligence sharing and joint operations.

What's next for India and the SCO?

- **For the SCO**: The **Heads of State Summit** in Tianjin (August–September 2025) must address the deadlock. Failure risks eroding the SCO's credibility as a counter-terror platform.
- **For India**:
  - **Selective Engagement**: Prioritize functional cooperation (e.g., RATS intelligence sharing) while resisting politicized narratives.
  - **Leverage Alternatives**: Strengthen partnerships like the **Quad** and **I2U2** to counterbalance SCO limitations.
  - **Diplomatic Outreach**: Rally support from Central Asian SCO members (e.g., Kazakhstan, Uzbekistan) to isolate Pakistan's stance.

Sustainable Development Report 2025

Context

- India entered the top 100 in the 2025 Sustainable Development Report (SDR) Index for the first time.

About the Sustainable Development Report 2025 (SDR)

- It provides an annual assessment of the progress made by UN member states in achieving the Sustainable Development Goals (SDGs).
- The UN Sustainable Development Solutions Network (SDSN) publishes this report.

Global and Regional Performance

- **European Dominance:** European countries, particularly the Nordic nations, continue to lead the index. Finland ranks first, followed by Sweden and Denmark. Nineteen of the top 20 countries are European.
- **Challenges for High-Rankers:** Even these top-ranking nations face challenges, especially concerning unsustainable consumption, which negatively affects climate and biodiversity goals.
- **East and South Asia's Progress:** East and South Asia emerge as the region showing the most significant SDG progress since 2015. Rapid socioeconomic development largely drives this advancement.
- India stands at 99th place out of 167 countries. It achieves an overall score of 67 out of 100, where a score of 100 indicates full achievement of all 17 SDGs.
- Comparing India's performance with its neighboring countries: China (49th), Bhutan (74th), Nepal (85th), Sri Lanka (93rd), Bangladesh (114th), Pakistan (140th).

Challenges to SDG Progress

- **Global Stagnation:** Progress on the SDGs has stalled worldwide. At the current pace, only 17% of the SDG targets are projected to be met by the 2030 deadline.
- **Areas of Reversal:** The world has moved backward on five key targets since 2015:
  - Obesity Rate (SDG 2: Zero Hunger)

- Press Freedom (SDG 16: Peace, Justice and Strong Institutions)
- Sustainable Nitrogen Management (SDG 2: Zero Hunger)
- Red List Index (measures biodiversity loss, SDG 15: Life on Land)
- Corruption Perceptions (SDG 16: Peace, Justice and Strong Institutions)

- **Broken Financial System:** The SDR 2025 emphasizes that the current international financial architecture fails to support the SDGs. High-income countries are not meeting their commitments to channel capital to developing nations.

Energy Transition Index

Context

- India ranked 71st in the World Economic Forum's 2025 Energy Transition Index (ETI).

About the Energy Transition Index (ETI)

- It evaluates the performance of a nation's current energy systems and their clean energy future that is more inclusive, sustainable and secure.
- A country's final score combines two main sub-indices:
  - **System Performance (60% weightage):** This measures the current state of a country's energy system across three core aspects:
    - ✓ **Equity:** It assesses the accessibility and affordability of energy.
    - ✓ **Security:** It evaluates the reliability and resilience of the energy supply.
    - ✓ **Sustainability:** It considers the environmental impact of energy production and consumption.
  - **Transition Readiness (40% weightage):** This assesses a country's preparedness for the energy transition based on five key factors:
    - ✓ **Political Commitment:** It looks at the presence of strong and stable policies.
    - ✓ **Finance and Investment:** It evaluates the flow of capital towards clean energy projects.
    - ✓ **Innovation:** It assesses the development and adoption of new energy technologies.
    - ✓ **Infrastructure:** It considers the quality and availability of energy and digital infrastructure.
    - ✓ **Education and Human Capital:** It examines the skills and workforce available to support the transition.

Highlights of the Energy Transition Index (ETI) 2025

- **Overall Improvement:** In 2025, 65% of countries improved their ETI scores. 28% showed progress across all three core dimensions of equity, security and sustainability.
- **Top Performers:** European countries continue to lead the rankings. Sweden, Finland and Denmark top the list, indicating their long-standing commitment to low-carbon energy policy.
- **Major Economies' Performance:** China reached 12th position due to its efforts in innovation and clean energy. Other major energy consumers like Brazil, the US and Nigeria have also shown progress across multiple dimensions.
- **India's Performance:** India is ranked 71st, a slip from its 63rd position in the previous year. The World Economic Forum notes that India, alongside China, has demonstrated significant improvements in energy efficiency and investment capacity.

> Despite a $2 trillion investment in clean energy in 2024, global carbon emissions reached a record 37.8 billion tons. Energy demand rose by 2.2%, driven by the increasing needs of artificial intelligence, data centers, cooling and electrification.

Operation Sindhu

Context

- The Government of India has launched "Operation Sindhu" to evacuate its citizens from Iran in response to escalating military tensions between Iran and Israel.

About Operation Sindhu

- It uses a combination of air and land routes to bring citizens back home. The Ministry of External Affairs (MEA) leads the operation, with its missions in Tehran (Iran) and Yerevan (Armenia) working in close coordination.
- **From Iran:** Indian Missions in Tehran, Yerevan and Ashgabat coordinated the evacuation of Indian nationals from Iran by road across land border crossings into neighboring Armenia and Turkmenistan. **Special Flights (from Armenia and Turkmenistan)** to bring the evacuated citizens to New Delhi.
- **Israel:** Indian Missions in Tel Aviv, Ramallah, Amman and Cairo facilitated the movement of Indian nationals across land borders into Jordan and Egypt. Evacuees returned from Amman and Sharm el Sheikh, utilizing evacuation flights, including Indian Air Force C-17 aircraft.

India leverages its friendly ties with countries such as Armenia, Turkmenistan, Jordan and Egypt to facilitate land and air evacuation routes.

India's Alliance with Armenia

Context

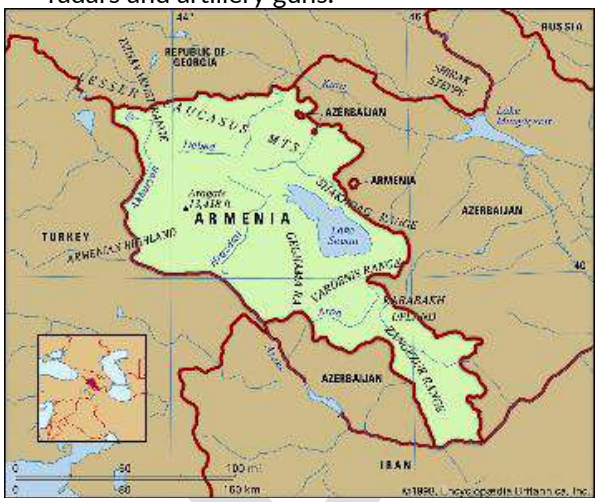
- The Iran-Israel conflict prompted India to launch "Operation Sindhu" to promote the evacuation of its nationals via a land route through Armenia.

About Armenia

- Armenia is a **landlocked country located in the Western Asia**, it lies in the South Caucasus region, **bordered by Georgia to the north, Azerbaijan to the east, Iran to the south and Turkey to the west.**
- Yerevan serves as its capital, largest city and financial center. Mount Aragats stands as the highest peak within its borders, while Lake Sevan is the largest lake in Armenia and one of the largest high-altitude lakes globally.

India-Armenia Relations

- Formal diplomatic relations started in 1992.
- Armenia has signed defense contracts worth over $1 billion with India, acquiring significant military systems. These include PINAKA multi-barrel rocket launchers, anti-tank missiles, radars and artillery guns.



Economic and Trade Ties

- Bilateral trade between India and Armenia **increased from $59 million in 2019 to $155.7 million by the end of 2023.**
- India's exports to Armenia largely include pharmaceuticals, machinery and tea, while Armenia exports minerals and alcoholic beverages to India.
- There is also growing cooperation in high-tech sectors like Artificial Intelligence (AI) and Information Technology (IT), where Armenia's skilled workforce complements India's expanding tech industry.

Geopolitical Alignment

- The partnership serves as a counterbalance to the strategic nexus involving Turkey, Azerbaijan and Pakistan. Armenia consistently supports India's position on the Kashmir issue.
- Both nations view each other as partners in creating a multipolar world order and collaborate in developing connectivity routes, such as the International North-South Transport Corridor (INSTC), where Armenia plays a key nodal role.

Chicago Convention

Context

- The Air India AI 171 crash probe in Ahmedabad is a standard procedure rooted in international agreement, the Chicago Convention.

Chicago Convention 1944

- The Convention on International Civil Aviation, commonly known as the Chicago Convention was signed in 1944.
- It led to the **creation of the International Civil Aviation Organization (ICAO)**, a specialized agency of the United Nations, headquarters are located in Montreal, Canada.
- **All 193 member states, including India,** committed to following the standards and practices set by the ICAO.
- ICAO also conducts regular audits of its member states to assess their ability to oversee their airlines and ensure compliance with ICAO standards.

Annex 13 of the Chicago Convention

- Annex 13 of the Chicago Convention specifically defines the rights and responsibilities of various countries connected to an aircraft accident.
- **State of Occurrence:** Country where the accident physically takes place. This state holds the primary responsibility for initiating and leading the investigation. In the case of the Ahmedabad crash, India led the probe through its Aircraft Accident Investigation Bureau (AAIB).
- **State of Registry:** Country where the aircraft is registered.
- **State of the Operator:** Country where the airline's main business operations are based. Since Air India is the operator, this state is also India.
- **State of Design and Manufacture:** Countries responsible for the design and production of the aircraft and its key components, such as engines. In the recent Ahmedabad crash, the aircraft involved was a Boeing jet, equipped with General Electric engines (both are American companies), which grants U.S. agencies the right to participate in the investigation.
- **State of Nationality:** Countries that have a special interest in the accident due to the death of its citizens can also participate. The presence of UK investigators in the Air India AI 171 crash probe is explained by the fact that 53 British nationals were among the victims of the accident.

G7 Summit

Context

- The 51st G7 Summit took place in Kananaskis, Alberta, Canada.

About G7

- The Group of Seven (G7) is an **informal grouping comprising seven of the world's most advanced economies:** Canada, France, Germany, Italy, Japan, the United Kingdom and the United States. The European Union also participates in the group's discussions. These nations convene annually to address global economic and political issues.

Evolution of the G7

- **Formation (1975):** The group originated as the "Group of Six" (G6) in 1975, with leaders from France, West Germany, Italy, Japan, the United Kingdom and the United States meeting to discuss the global economy following the 1973 oil crisis.
- **Canada Joins (1976):** In 1976, the group expanded to become the G7 with the inclusion of Canada, reflecting its growing economic significance.
- **The G8 Phase (1998-2014):** In 1998, Russia received a formal invitation to join, creating the "Group of Eight" (G8).
- **Return to G7 (2014):** The G8 reverted to the G7 format in 2014 following Russia's suspension from the group due to its annexation of Crimea. The remaining members have maintained the G7 format since then.

About 51st G7 Summit

- **Failure to Reach Consensus on Ukraine:** The United States opposed a strongly worded condemnation, expecting to maintain its negotiating leverage. This led Canada, as the host nation, to scrap the planned joint statement.
- **U.S. President Trump's Short Departure:** President Trump left the summit a day early to address the escalating conflict between Israel and Iran from Washington. President Trump

also used the summit as a platform to suggest that Russia should be readmitted to the group.

- **Other Agreements:** While major political agreements on contentious issues faltered, the G7 nations managed to sign joint statements on less controversial topics. These included agreements on critical minerals, Artificial Intelligence (AI), wildfires, quantum computing, migrant smuggling and transnational repression.

Gender Gap Index 2025

Context

- The World Economic Forum publishes the 19th edition of its Global Gender Gap Index for 2025.

About Global Gender Gap Index

- It assesses how close countries are to achieving gender parity, which signifies equality between men and women. It measures gender disparities across 148 economies.
- The index assesses gender parity across four key dimensions, known as subindexes:
  - **Economic Participation and Opportunity**: Includes labor force participation, wage equality for similar work and estimated earned income.
  - **Educational Attainment**: Covers literacy rates and enrollment in primary, secondary and tertiary education.
  - **Health and Survival**: Measures the sex ratio at birth and healthy life expectancy.
  - **Political Empowerment**: Representation of women in parliament, ministerial positions and the number of years with a female head of state.
- Scores range from 0 to 1, where a score of 1 signifies full gender parity. The index helps countries identify areas for policy intervention and prioritize efforts to close existing gender gaps.

Highlights of the 2025 Index

- The global gender gap stands at 68.8% closed across all 148 economies included in the index. This marks a modest improvement of 0.3% points from 68.4% in 2024. Despite this progress, full global gender parity remains about 123 years away at the current pace.
- **The Health and Survival gender gap has closed by 96.2%** and the Educational Attainment gap by 95.1%. However, Economic Participation and Opportunity has closed by 61.0% and Political Empowerment by 22.9%.
- Iceland continues to hold the top position globally, having closed 92.6% of its gender gap. It remains the only country above 90% parity. Other top-performing countries include Finland, Norway, the United Kingdom and New Zealand, which ranks 5th globally.

India's Performance

- India ranks 131st out of 148 countries in the Global Gender Gap Report 2025, a slip of two places from its 129th position in 2024.
- India's overall gender parity score shows a slight improvement of 0.3 percentage points, reaching 64.4%.
- Within the South Asian region, India ranks fifth. It stands behind Bangladesh, Bhutan, Nepal and Sri Lanka.

High Seas Treaty

Context

- At the United Nations Ocean Conference (UNOC3) in Nice (France), the Union Minister for Science and Technology stated that India is evaluating the High Seas Treaty .

About High Seas Treaty

- The Biodiversity Beyond National Jurisdiction (BBNJ) agreement, commonly known as the 'High Seas Treaty,' marks the **first international legally binding treaty** to address the conservation and sustainable use of marine biodiversity in the high seas.
- The treaty was formally adopted in June 2023, by UN Member States, it opened for signing and ratification in September 2023.
- It becomes **legally effective 120 days after 60 countries formally ratify it. As of June 2025, 50 countries have completed the ratification process.** France, as co-host of the UN Ocean Conference, emphasizes accelerating treaty ratification. The signature period for the treaty closes on September 20, 2025.

- India signed the treaty in 2023, but not yet ratified.

BBNJ Agreement is built upon four pillars

- **Marine Genetic Resources (MGRs):** Establishes rules for accessing marine genetic resources found in the high seas. It also ensures the fair and equitable sharing of benefits derived from these resources, including both monetary and non-monetary gains.
- **Area-Based Management Tools (ABMTs):** Provides a mechanism for establishing Marine Protected Areas (MPAs). These MPAs aim to conserve and manage specific, ecologically important parts of the high seas.
- **Environmental Impact Assessments (EIAs):** Mandates that countries conduct and publicize Environmental Impact Assessments for any planned activities in the high seas that could significantly affect the marine environment. This ensures that new activities with marine impacts undergo thorough assessment.
- **Capacity-Building and Transfer of Marine Technology:** Assist developing nations by providing them with the necessary funding, skills and technology. This support empowers these nations to effectively participate in and implement the treaty's provisions.

High Seas

- The high seas enclose parts of the ocean that lie beyond any country's Exclusive Economic Zone (EEZ). These international waters cover nearly two-thirds of the world's oceans, representing almost half of the planet's entire surface.
- Despite their rich marine life, these areas face increasing threats from pollution, climate change and overfishing .Currently, less than 1% of the high seas receive full protection and the High Seas Treaty provides a comprehensive framework to address this gap.
- The High Seas Treaty is essential for implementing the Global Biodiversity Framework, which commits countries to protect and conserve at least 30% of the ocean and restore 30% of degraded areas by 2030.

2.3 SNIPPETS

Topics	Details
UN Development Conference in Seville	• The Fourth International Conference on Financing for Development (FFD4) was held in Seville (Spain), to mobilize resources for achieving the Sustainable Development Goals (SDGs). • The 4th International Conference on Financing for Development (FFD4) is a UN-led summit to reform global finance systems and mobilize resources for the Sustainable Development Goals (SDGs). • Organized by the United Nations Department of Economic and Social Affairs (UNDESA) and the United Nations Economic and Social Council (ECOSOC). • It is built on past agreements like the Monterrey Consensus (2002) and Addis Ababa Action Agenda (2015), but with heightened urgency due to climate crises, debt distress in 35+ countries and a $4 trillion annual SDG funding gap.
Samson Option	• The "Samson Option" has been frequently mentioned in the news in the context of the Israel-Iran War. • The "Samson Option" is a **doctrine of massive nuclear retaliation that Israel would employ if it faced imminent destruction from a military attack.** • Pulitzer Prize-winning journalist Seymour Hersh popularized the term in his 1991 book, The Samson Option.

	• This doctrine implies that Israel could use nuclear weapons as a last resort against a non-nuclear state or a coalition of states if they launched an overwhelming conventional attack.A key element related to the Samson Option is Israel's long-standing policy of nuclear ambiguity, means Israel has never officially confirmed nor denied its possession of nuclear weapons.
ASEAN-India Trade In Goods Agreement (AITIGA)	• ASEAN is delaying the ASEAN-India Trade in Goods Agreement (AITIGA) trade pact review with India. • The ASEAN-India Trade in Goods Agreement (AITIGA) is a Free Trade Agreement (FTA) between India and the ten member states of the Association of Southeast Asian Nations (ASEAN). • It was **signed in 2009 and has not delivered expected benefits for India, prompting India to push for a comprehensive review of its terms.** • India's core concerns with AITIGA include a massive and widening trade deficit, non-reciprocal and asymmetrical tariff reductions, "routing" of Chinese goods and non-tariff barriers (NTBs). • India has been pushing for a review of AITIGA since 2015, but ASEAN agreed to begin the review process in 2019. The actual negotiations have been slow and unproductive, with nine rounds of negotiations taking place but progress remaining limited. Both sides have set a target to conclude the review by the end of 2025.
ARIES	• A meeting of international atmospheric science experts was held at the Aryabhatta Research Institute of Observational Sciences (ARIES) in Nainital, Uttarakhand. • The **meeting was hosted by ARIES, an autonomous research institute under the Department of Science & Technology (DST).** It is a center for research in astronomy, astrophysics and atmospheric sciences. • Around 70 global experts from countries including the USA, Germany, Japan, Australia and Belgium, participating both in-person and online.
India And The Central American Integration System (SICA)	• India and the Central American Integration System (SICA) held a virtual dialogue to strengthen bilateral cooperation and deepen engagement across key sectors. • SICA functions as the institutional framework for regional cooperation among the countries of Central America, promoting peace, democracy and development. • The organization **officially established itself in December 1991, through the signing of the Tegucigalpa Protocol, which updated the charter of the previous Organization of Central American States (ODECA).** It formally began operations in February 1993. • The founding members of SICA include Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua and Panama. • The General Secretariat is located in El Salvador. The Presidency of the organization rotates among member states every six months.
International Organization For Marine Aids To Navigation (IALA)	• India, as the Vice President of the International Organization for Marine Aids to Navigation (IALA), participated in the 2nd Session of the IALA Council held in Nice, France. • It is a global standard-setting body for marine aids to navigation, prevent accidents, protect the marine environment and facilitate the smooth flow of commerce. • **Founded in 1957 as a non-governmental organization, IALA became an Intergovernmental Organization (IGO)** in August 2024 after 34 countries, including India, ratified its new status. • Its structure includes a General Assembly meeting every four years and a Council

	meeting twice a year. • India, a member since 1957, is represented by the Directorate General of Lighthouses and Lightships (DGLL).
World Day Against Child Labour 2025	• The World Day Against Child Labour 2025 celerated on 12th June. • It was **launched by the International Labour Organization (ILO) in 2002** to highlight the global issue of child labor and to promote efforts to eliminate it. • **Theme of 2025 "**Progress is clear, but there's more to do: let's speed up efforts!" • Globally, the ILO and UNICEF report that nearly 138 million children were engaged in child labour in 2024. Of these, around 54 million were in hazardous work that is likely to harm their health, safety, or development.
UNSC Committees	• Pakistan becomes Chair of Taliban Sanctions Committee and Vice Chair of UNSC Counter-Terrorism Committee. • **Pakistan's appointment was due to rotational practice,** as elected non-permanent members chair at least one subsidiary body during their two-year tenure. o Pakistan has been elected as a non-permanent member of the UN Security Council (UNSC) for the 2025-26 term. • Pakistan has a history of using its UNSC presidency to its advantage, such as redirecting the Council's focus towards the Kashmir issue and hosting debates on counter-terrorism to deflect from its own poor track record. • **India's challenge lies in countering Pakistan's broader influence as a UNSC member.** India must remain strategically vigilant and prepared to proactively counter any attempts by Pakistan to use its rotational presidency to internationalize bilateral issues or dilute the global focus on its role as a sponsor of cross-border terrorism.
International Institute Of Administrative Sciences (IIAS)	• India Assumes Presidency of the International Institute of Administrative Sciences (IIAS) for the 2025-2028 term. • The International Institute of Administrative Sciences (IIAS) is a **global non-governmental organization established in 1930,** headquartered in Brussels, Belgium. • It produces and promotes comprehensive research on public governance, convenes experts through high-impact events and promotes collaboration through strategic projects. • It has 31 member states, with India being a key member since 1998. There are 20 national sections and 15 academic research centers. • **Although not formally affiliated with the United Nations, the IIAS maintains a close working relationship** with the organization, actively engaging with its work in public administration.
ECOWAS	• The Economic Community of West African States (ECOWAS) celebrated its 50th anniversary with a high-level conference in Lagos, Nigeria. • ECOWAS is a **regional political and economic union of fifteen countries located in West Africa.** • It was founded in 1975, through the signing of the Treaty of Lagos, to create a large trading bloc to promote economic self-sufficiency for its member nations. • **It currently comprises 12 member states**: Benin, Cabo Verde, Côte d'Ivoire, The Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Nigeria, Senegal, Sierra Leone and Togo. • Burkina Faso, Mali and Niger announced their withdrawal from ECOWAS in

	January 2024, forming a separate bloc called the Alliance of Sahel States.
Ejiao	• Donkey prices in Pakistan have increased due to demand from China's ejiao industry. • Ejiao is a **hard gelatin made by stewing donkey skin**. The gelatin is then dried and used in various tonics, pills and health food products. • In China, **a growing middle class seeks Ejiao for its health benefits. Practitioners of Traditional Chinese Medicine (TCM) believe Ejiao:** o Improves blood circulation and treats anaemia. o Boosts the immune system. o Acts as an anti-fatigue agent. o Is considered a luxury wellness product. • China's domestic donkey population has declined due to high demand and the slow reproductive rate of donkeys and Pakistan emerging as a key potential source.
High-Net-Worth Individual (HNWI)	• The World Wealth Report 2025 released by the Capgemini Research Institute. • The World Wealth Report, covering 71 countries, identifies High-Net-Worth Individuals (HNWIs) as those with investable assets of $1 million or more. • The report categorizes HNWIs into three tiers: Millionaires Next Door, Mid-Tier Millionaires and Ultra-HNWIs. • The US led the world in adding new millionaires, with a total of 7.9 million. The US is home to 36% of centi-millionaires and 33% of billionaires. Alternative investments, such as private equity and cryptocurrencies, now make up 15% of HNWI portfolios. China experienced a 1.0% decline in its HNWI population. • India experienced an 8.8% rise in HNWI wealth in 2024, with 378,810 millionaires and a collective wealth of $1.5 trillion.

2.4 ADDITIONAL TOPICS FOR READING FROM IASGYAN WEBSITE

Topic Name	Date
DRONE WARFARE AND INDIA	13th June, 2025
PM MODI IN CYPRUS	17th June, 2025
LEGALITY OF ISRAEL'S STRIKES ON IRAN	20th June, 2025
INDIA CROATIA RELATIONS	21st June, 2025
A NEW REALISM IN GLOBAL POLITICS	21st June, 2025
ASSISTED DYING	24th June, 2025
LESSONS FROM OPERATION SINDOOR'S GLOBAL OUTREACH	25th June, 2025
THE ISRAEL-IRAN CEASEFIRE – MANAGING THE BLOWBACK	30th June, 2025

3. ECONOMY

3.1 SHORT ARTICLES

Prada-Kolhapuri Chappal Controversy & Gi Tag Limitations

Context

- Kolhapuri chappal makers can't get compensation from Prada for cultural appropriation, despite having a GI tag.

What triggered the Prada-Kolhapuri chappal controversy?

- At **Milan Fashion Week (June 2025)**, Prada showcased **T-strap leather sandals** priced at **₹1 lakh+ per pair**, mirroring the design of India's GI-tagged **Kolhapuri chappals** (which sell for ₹1,000–2,000 locally).
- The brand initially labeled them generically as "leather sandals," omitting any reference to their Indian roots, sparking accusations of **cultural appropriation** and **economic exploitation** from artisans, politicians and industry bodies in Maharashtra.

About Kolhapuri Chappals

- **Historical Roots**: Dating to the **12th century**, these sandals were crafted by the **Dalit Chambhar community** and later patronized by Kolhapur's royalty. Over **20,000 families** in Maharashtra and Karnataka rely on this craft today.
- **Artisanal Process**: Handmade from **buffalo hide** using vegetable tanning, each pair takes **8–10 hours** to craft. The GI tag (awarded in 2019) recognizes their unique link to the Kolhapur region.

Why can't artisans demand compensation despite the GI tag?

- **Name v/s Design Protection**: The tag safeguards the **"Kolhapuri" name** but not the **design itself**. Prada avoided violation by not using the term "Kolhapuri".
- **Territorial Enforcement**: GI rights are **country-specific**. India's tag holds no legal weight in Italy, where Prada operates.
- **Collective Ownership**: Traditional crafts lack **individual authorship**, making it hard to claim copyright or patents under current IP laws.

A **PIL in Bombay High Court** demands Prada issue a **public apology** and compensate artisans, but legal experts note monetary claims may fail.

What steps are required to protect traditional crafts?

- **Legal Reforms**:
  - Push for **WIPO's international GI framework** to cross-border protection.
  - Amend India's **GI Act** to cover **design elements**, not just names.
- **Community Empowerment**:
  - **Co-branding models**: Luxury brands could partner with artisans (e.g., **"Prada x Kolhapuri"** collections with profit-sharing).
  - **Fair Trade Certification**: Ethical labels can help artisans command premium prices.
- **Policy Support**:
  - Subsidize **buffalo leather** imports to offset cow vigilante disruptions.
  - Fund **artisan cooperatives** to streamline e-commerce and exports.

Digital Payment Intelligence Platform

Context

- The Reserve Bank of India (RBI) has proposed the Digital Payment Intelligence Platform (DPIP) to combat online financial fraud.

What is DPIP?

The **Digital Payment Intelligence Platform (DPIP)** is a **real-time fraud prevention system** being developed by the **Reserve Bank of India (RBI)** in collaboration with public/private banks. It aims to:

- **Proactively block frauds**: Shift from reactive detection to **real-time prevention** by sharing fraud alerts across banks.
- **Combat surging frauds**: Digital payment frauds nearly **doubled in volume (1.65 crore to**

3.02 crore) and **value (₹14,570 crore to ₹30,420 crore)** between FY23–FY24.

- **Close loopholes**: Currently, fraudsters exploit delayed reporting by moving stolen funds across banks before detection.

RBI's FY25 report reveals **₹36,014 crore in bank frauds**, with **56.5% in digital payments** (cards/UPI).

How will DPIP function technically?

DPIP will operate as a **centralized AI-driven hub** with three core mechanisms:

- **Real-Time Alerts**: Banks flag suspicious transactions (e.g., phishing-linked accounts) on DPIP, triggering **instant alerts** for all participating institutions.
- **AI/ML Analysis**: Aggregates data from **UPI, RuPay, internet banking** to detect patterns (e.g., mule accounts, deepfake scams).
- **Automated Blocks**: Systems auto-decline transactions linked to flagged entities (IPs/accounts).

If **Bank A** detects a fraudster using mobile number X, **Bank B** can block X instantly, preventing fund transfers 10.

Timeline

- **AP Hota Committee** drafted the framework; **RBI Innovation Hub (RBIH)** is developing the prototype with **5–10 banks**.
- Pilot testing with select banks (e.g., SBI, HDFC) by **September 2025**.
- **Full rollout**: Expected by **March 2026** as part of India's **Digital Public Infrastructure (DPI)** stack.

Price Support Scheme (PSS)

Context

- The Union Agriculture Minister has approved the procurement of moong (green gram) and urad (black gram) in Madhya Pradesh and urad in Uttar Pradesh, under the Price Support Scheme (PSS).

What is PM-AASHA?

- Price Support Scheme (PSS) is a component of the Pradhan Mantri Annadata Aay Sanrakshan Abhiyan (PM-AASHA), an umbrella scheme launched in 2018 to ensure remunerative prices for farmers.
- The Government has extended PM-AASHA until March 31, 2026, with a total financial allocation of Rs. 35,000 crore.

Three components are:

- **Price Support Scheme (PSS):** It involves physical procurement of pulses, oilseeds and copra at MSP by government agencies.
- **Price Deficiency Payment Scheme (PDPS):** It does not involve physical buying. Instead, it directly pays farmers the difference between the MSP and the market price, primarily for notified oilseeds, into their bank accounts.
- **Pilot of Private Procurement & Stockist Scheme (PPSS):** It allows the participation of private sector players in the procurement process on a pilot basis, offering an option for states for oilseed procurement in selected districts.

A **state can choose only one of the three schemes** for a single commodity to avoid operational overlap.

How does the PSS operate?

- **Procurement Process:** Central nodal agencies, collaborating with state governments, directly purchase the produce from pre-registered farmers at the declared MSP.
- **Procurement Limit:** Under normal circumstances, procurement is capped at 25% of a state's total production for that specific crop. However, for the procurement years 2023-24 and 2024-25, the government lifted this ceiling, permitting up to 100% procurement of Tur, Urad and Masur to boost domestic output and achieve self-sufficiency in pulses. This measure will continue for another four years.
- **Duration:** Procurement operations continue until market prices stabilize at or above the MSP.
- **Financial Support:** The Central Government bears the expenditure and any losses incurred during procurement operations. Funds transfer directly to farmers' bank accounts ensures transparency.

The National Agricultural Cooperative Marketing Federation of India (NAFED) acts as the primary agency. The National Cooperative Consumers' Federation of India (NCCF) and the Food Corporation of India (FCI) support NAFED, stepping in where NAFED's presence is limited.

Net Interest Margin (NIM)

Context

- Indian Banks are implementing strategies to protect their net interest margin (NIM).

What is Net Interest Margin (NIM)?

- It measures a bank's expertness in managing its core business: borrowing money at a lower cost and lending it at a higher rate. A healthy NIM indicates a bank's profitability and stability.

Factors influence NIM

- **RBI's Monetary Policy:** When the RBI cuts the repo rate, banks expect to lower their lending rates. If their deposit rates do not fall as quickly, their NIM can compress. In a rising rate environment, NIMs can expand if loan rates rise faster than deposit rates.
- **Cost of Funds:** A bank's ability to attract low-cost deposits is crucial. A higher CASA ratio (share of Current Account and Savings Account deposits) is highly beneficial, as banks pay very low or no interest on these funds. This reduces their overall Interest Expense and boosts NIM.
- **Yield on Assets:** The mix of loans matters. High-risk loans like personal loans and credit cards carry higher interest rates (higher yield), which can increase NIM. Safer loans like mortgages, however, have lower yields.
- **Credit Risk:** While lending to riskier sectors can increase interest income, it also increases the risk of defaults (Non-Performing Assets or NPAs). When a loan becomes an NPA, the bank must stop recognizing interest income on it, which directly hurts the NIM.
- **Competition:** In a highly competitive banking sector, banks may be forced to offer lower interest rates on loans or higher rates on deposits to attract and retain customers. This competition puts downward pressure on NIMs.
- **Operational Efficiency:** A bank that effectively manages its interest rate risk and minimizes its non-interest operational costs is better positioned to protect its margins.

What strategies do banks employ to protect their Net Interest Margins?

- **Focus on CASA Mobilization:** They launch campaigns to attract more customers to open savings and current accounts, thereby lowering their average cost of funds.
- **Shift Lending Focus:** Banks may increase their focus on high-yield retail loans, MSME (Micro, Small and Medium Enterprises) loans and agricultural loans, which offer better margins.
- **Manage Deposit Rates:** They strategically adjust the interest rates offered on new fixed deposits to align with prevailing lending rates.
- **Strengthen Recovery Processes:** By improving the recovery of bad loans (NPAs), banks can convert non-earning assets back into earning assets, which directly supports the NIM.

World Investment Report 2025

Context

- The United Nations Conference on Trade and Development (UNCTAD) annually publishes the World Investment Report.

About UNCTAD

- It serves as the **principal organ of the UN** for addressing trade and development issues.
- Established in 1964, its headquarters are in Geneva, Switzerland.
- It promotes the trade, investment and development interests of developing countries. It also assists in their fair integration into the world economy.

Highlights of the World Investment Report 2025

- **Global FDI Decline:** Global FDI flows fell by 11% in 2024, marking the second consecutive year of decline.
- **Setback for SDGs:** Investment in critical Sustainable Development Goal (SDG)-related sectors in developing countries saw a sharp drop of 25-33%. This decline affected vital areas such as infrastructure, renewable

energy, water, sanitation and agriculture. Only the health sector witnessed growth.

- **Digital Economy Divide:** While FDI in the global digital economy grew by 14%, its benefits remain unevenly distributed. 80% of greenfield projects in the digital sector in the Global South concentrated in just 10 countries.

Top FDI Destinations

- The United States maintained its position as the world's top FDI destination, with inflows rising to $279 billion.
- China experienced a sharp 29% decline in FDI inflows, causing it to fall from the second position in 2023 to fourth in 2024.
- **Despite a 3% dip, developing economies in Asia remained the world's primary destination for foreign investment,** attracting $605 billion. This amount accounts for 40% of the world's total FDI.

India's Performance in FDI

- **Improved Global Ranking:** India climbed one position to rank 15th globally as an FDI destination in 2024, up from 16th in 2023.
- **FDI Inflows:** The country attracted $27.6 billion in FDI, a marginal dip from the $28.1 billion received in the previous year.
- India ranked fourth globally in greenfield project announcements. This signals strong long-term investor confidence in setting up new manufacturing and operational facilities within the country.
- India ranked among the top five economies for securing large-scale international project finance deals.
- Indian companies invested $24 billion overseas, pushing India's rank for FDI outflows to jump from 23rd to 18th.

Coffee Exports

Context

- India's coffee exports have grown by **125% over the last 11 years** , reaching a value of **$1.8 billion.**

India in the Global Coffee Market

- India holds the position of the world's seventh-largest coffee producer, contributing about 3% to the global output. It also ranks as the fifth-largest coffee exporter worldwide, accounting for 5% of the world's total coffee exports.
- The coffee sector provides direct and indirect jobs to about two million people across India.
- **Key Export Destinations:** Europe serves as the primary market for Indian coffee. Major importing countries include Italy, Germany and Belgium. Other significant buyers are Russia, the United Arab Emirates, Japan and South Korea.

India promotes shade-grown coffee, where coffee plants grow under a canopy of diverse native trees. This method benefits biodiversity, conserves soil and water and increases carbon sequestration. It also ensures Indian coffee complies with international environmental standards, including the European Union's deforestation regulation.

Coffee cultivation in India

- **Traditional Coffee Growing States:**
  - **Karnataka:** This state produces over 70% of India's total coffee. Coorg, Chikmagalur and Hassan serve as the main coffee hubs.
  - **Kerala:** As the second-largest producer, Kerala accounts for about 20% of the country's coffee, primarily growing Robusta in regions like Wayanad.
  - **Tamil Nadu:** This state contributes around 5% of the total production, with the Nilgiris and Palani hills being the key cultivation areas.
  - **Non-Traditional Areas:** India is also promoting coffee cultivation in non-traditional states such as Andhra Pradesh (specifically in the Araku Valley), Odisha and the states in the Northeast.

Goan Feni

Context

- Goan Feni, a traditional spirit from Goa, has been granted a Geographical Indication (GI) tag.

About Goan Feni

- The Goa government had earlier declared Feni as the 'Heritage Spirit of Goa' in 2016.
- The name 'Feni' derives from the Sanskrit word *phena*, meaning 'froth', which refers to the bubbles that form when the liquor is shaken or poured.

The Two Types of Feni

- **Cashew Feni (Kaju Feni):** This is the more popular and GI-tagged version. It possesses a strong, pungent and fruity aroma with a distinct taste. Its alcohol by volume (ABV) ranges between 40-45%.
- **Coconut Feni:** Made from the fermented sap (toddy) of the coconut palm, this was the original Feni. It is generally milder and smoother than its cashew counterpart.

While coconut Feni predates colonial rule, Cashew Feni's history began in the 16th and 17th centuries when the Portuguese introduced cashew trees from Brazil to Goa. Initially planted for soil conservation, the locals soon discovered the potential of the cashew apple for distillation.

Cropic

Context

- The "Collection of Real-time Observations & Photo of Crops (CROPIC)" program utilizes modern technologies like Artificial Intelligence (AI) and crowdsourcing to bring efficiency and transparency to the agricultural sector.

About CROPIC

- The Collection of Real-time Observations & Photo of Crops (CROPIC) project aims to integrate modern technologies like Artificial Intelligence (AI) and crowdsourcing into the agricultural sector.
- It aims to enhance efficiency and transparency in crop monitoring and damage assessment.
- The project is initially planned as a pilot study for the Kharif 2025 and Rabi 2025-26 seasons, with a nationwide rollout expected from 2026.

How CROPIC Works?

- **Data Collection:** Farmers and field officials utilize a dedicated CROPIC mobile application to capture geo-tagged photographs of crops. They take these photographs at various stages of the crops' growth cycle, 4-5 times per season.
- **Crowdsourcing Model:** Collecting images directly from the fields ensures a high volume of real-time, location-specific data, which provides a comprehensive view of crop conditions.
- **AI-Powered Analysis:** Collected photographs are uploaded to an AI-based cloud platform, algorithms then analyze these images to extract crucial information.
- **Visualization Dashboard:** Analyzed information is then presented on a web-based dashboard for easy interpretation by government officials and other relevant stakeholders.

Significance

- A major challenge in crop insurance involves the accurate and timely assessment of crop damage. CROPIC aims to automate this process. When a farmer reports a loss, officials can use the app to capture photographic evidence, which the AI model analyzes to verify the extent of the damage.
- By automating loss assessment, CROPIC expects to reduce the time taken to process and pay insurance claims to affected farmers.
- It builds a digital library of crop images from different regions and seasons. The database will serve as an invaluable resource for future agricultural research, policy-making and the development of more accurate predictive models, contributing to long-term agricultural development.

Heeng

Context

- Indian scientists have successfully cultivated Heeng (Asafoetida) within the country.

Heeng Cultivation in India

- Historically, **India imported its entire supply of Heeng from countries such as Afghanistan, Iran and Uzbekistan.** This complete dependence originated from the unique and challenging agro-climatic conditions that the

plant requires for successful growth and maturity.

Agro-Climatic Requirements

- **Climate:** It requires cold and arid (desert-like) conditions.
- **Temperature:** While it flourishes in temperatures ranging from 10-20°C, it demonstrates resilience, tolerating extreme lows of -4°C and highs of 40°C.
- **Rainfall:** The plant prefers very low moisture and an annual rainfall of no more than 200-300 mm.
- **Soil:** Ideal soil conditions include sandy, well-drained soil with a low moisture content.

Biological Hurdles

- **Low Germination Rate:** Heeng seeds show a very low germination rate, typically around 1%.
- **Long Dormancy Period:** The seeds also possess a prolonged dormancy period, complicating cultivation efforts.
- **Perennial Nature:** It is a perennial plant that requires five years to mature and begin flowering, which makes it a long-term agricultural investment.

Researchers at the Council of Scientific and Industrial Research's (CSIR) Institute of Himalayan Bioresource Technology (IHBT) in Palampur (Himachal Pradesh) developed specific protocols to overcome the inherent challenges of seed dormancy and low germination rates.

Buddha Rice

Context

- The Ministry of Commerce, in collaboration with Uttar Pradesh (UP), promotes Kalanamak rice, also known as "Buddha Rice," for export to countries such as Thailand, Vietnam and Singapore.

About Kalanamak Rice

- It is a **special, aromatic rice variety cultivated in Nepal and India,** specifically within the Himalayan Tarai region of Nepal (Kapilvastu) and eastern Uttar Pradesh, particularly in Siddharth Nagar and adjacent districts.
- Its name derives from its black husk, with "kala" meaning "black" and "namak" meaning "salt" in Hindi, referring to the saline soil in which it grows.
- It is non-basmati rice, received the Geographical Indication (GI) Tag in 2013, certifying its origin and unique qualities.

> Kalanamak rice has been in cultivation since the original Buddhist period, dating back to 600 BC. Archaeological evidence confirms the presence of Kalanamak grains during excavations at Kapilvastu, highlighting its ancient lineage.

Unique Features and Benefits

- This rice is rich in essential nutrients, including iron, zinc and protein. With a low glycemic index (below 55), it is a diabetic-friendly option.
- It helps to **regulate blood pressure, improves skin health and possesses significant antioxidant properties.**
- During the severe drought of 2001–2003 in the Tarai region, when other rice yields dropped by up to 50%, Kalanamak rice remained unaffected, indicating its resilience to adverse environmental conditions.
- Kalanamak employs a unique double transplantation process called "Kalam." This method involves planting 30–35-day-old seedlings in bunches, then separating and replanting them after an additional 25–30 days. This **dual transplantation boosts the yield compared to single transplantation methods.**
- It outperforms Basmati economically, requiring lower input and labor costs while yielding 40–50% more. Studies estimate its net return at Rs 22,447 per hectare, with potential earnings reaching Rs 50,000, considerably higher than Basmati's Rs 12,564 per hectare.

RBI's New Draft Rules for Gold Loans

Context

- The Reserve Bank of India (RBI) has issued new draft guidelines for gold loans to standardize practices across various financial institutions, including banks, non-banking

financial companies (NBFCs), cooperative banks and regional rural banks (RRBs).

Details

- The Finance Ministry has proposed exempting gold loans below ₹2 lakh from these new norms to protect vulnerable small borrowers, who constitute an estimated 60-70% of gold loan customers. The Ministry suggests implementation from January 1, 2026, to allow stakeholders time to adjust.

Highlights of the Draft Rules for Gold Loans

- **Eligible Collateral:** Borrowers can pledge only gold jewelry, ornaments, or bank-issued gold coins (22-carat or higher) for loans. The rules prohibit pledging gold bars, ingots, or bullion (referred to as "primary gold"). The total weight of pledged gold cannot exceed 1 kg per borrower, with a cap of 50 grams for gold coins. For silver coins, the limit is 500 grams.
- **Loan-to-Value (LTV) Ratio:** The RBI caps the LTV ratio at 75% for consumption loans, such as those for medical bills or household expenses. This means borrowers can receive up to ₹75,000 for gold worth ₹1 lakh.
- **Proof of Ownership:** Borrowers must provide proof of ownership for the pledged gold. If a borrower lacks a purchase receipt, they need to submit a declaration explaining how they acquired the gold.
- **Loan Repayment and Collateral Return:** Upon full loan repayment, lenders must return the gold within 7 working days. If lenders delay, they must pay ₹5,000 per day as compensation. In case of default, lenders must provide at least one month's notice before auctioning the gold. Auctions must be publicly advertised in two newspapers, with a reserve price not below 90% of the current market value. Lenders must return any surplus from the auction to the borrower within 7 days.

3.2 SNIPPETS

Topics	Details
International Potato Centre (CIP)	• The Union Cabinet approved a proposal to establish the International Potato Centre (CIP)'s South Asia Regional Centre (CSARC) at Agra, Uttar Pradesh. • International Potato Centre (CIP) was founded in 1971, **is a research center under CGIAR (formerly the Consultative Group on International Agricultural Research), headquartered in Lima, Peru,** with a mission to transform agri-food systems using potato, sweet potato and Andean root crops. Its **core goals are:** ○ **Nutrition Security:** Develop **biofortified varieties** (e.g., vitamin A-rich sweet potato) to combat malnutrition. ○ **Climate Resilience**: Breed **drought-tolerant and disease-resistant** crops (e.g., late blight-resistant potatoes). ○ **Economic Inclusion**: Empower **15 million smallholder households** in Africa and Asia to increase incomes by **15%** through improved varieties and value chains. • India produces **54 million tons annually** (2nd globally), with **UP (35%), West Bengal (25%) and Bihar (15%)** as top potato growers.
MCA21 Portal	• The Ministry of Corporate Affairs (MCA) is upgrading its MCA21 portal to improve corporate services. • MCA21 Portal was **launched in 2006, is an e-Governance Mission Mode Project under the National e-Governance Plan**, aimed at automating regulatory compliance for the corporate sector. • It provides a secure online interface for companies, professionals and the general public to interact with the Registrar of Companies (RoC). • The most recent development is the phased migration of the entire system from

	its legacy platform (Version 2 or V2) to a new, technologically superior platform (Version 3 or V3). • The V3 portal uses Artificial Intelligence and Machine Learning for proactive monitoring and automated scrutiny of filings, identifying non-compliant entities or potential shell companies more effectively. It also includes dedicated modules for online adjudication of penalties and a comprehensive compliance management system.
Global Education Monitoring (GEM) Report	• The Global Education Monitoring (GEM) Report, published by UNESCO, indicates a significant increase in the number of out-of-school children globally. • The GEM Report estimates the number of out-of-school children and youth are around 272 million. • The report projects a shortfall in achieving national education goals, indicating that by 2025, countries are on track to miss their Sustainable Development Goal 4 (SDG 4) targets, which aim to ensure inclusive and equitable quality education for all. • The crisis affects all levels of schooling, with the challenge escalating as children advance in age: ○ **Primary School (ages 6-11):** 78 million children (11%) are out of school. ○ **Lower Secondary School (ages 12-14):** 64 million adolescents (15%) are out of school. ○ **Upper Secondary School (ages 15-17):** 130 million youth (31%) are out of school. This represents the most critical stage, with nearly one in three youths globally denied an upper secondary education. • The GEM Report was launched in 2002 as the Education for All Global Monitoring Report and changed to its current name in 2016. • It aims to monitor and analyze global education trends and provide policy recommendations to governments and stakeholders to improve education systems and outcomes.
Revision of GDP Methodology	• India is set to revise its GDP base year to 2022-23 by 2026. • The Ministry of Statistics and Programme Implementation (MoSPI) has initiated the process to revise key economic indicators, with the new base year for GDP and the Index of Industrial Production (IIP) being 2022-23 and the Consumer Price Index (CPI) being 2023-24. • The **revised GDP series is scheduled for release on February 27, 2026.** • Revisions are necessary to accurately represent the current structure of economies, including the rise of new sectors like the digital economy and gig economy. • The "base year" provides an updated set of constant prices, allowing for a meaningful comparison of economic performance over time.
Merchant Discount Rate (MDR)	• The Union Ministry of Finance dismissed speculation regarding the imposition of a Merchant Discount Rate (MDR) on transactions conducted via the Unified Payments Interface (UPI). • **MDR represents a fee that a merchant or business pays to their bank for accepting digital payments, such as those made via credit or debit cards**. When a customer uses a card for payment, the full transaction amount does not credit the merchant's account; the bank deducts the MDR fee before settling the payment.

	• The deducted MDR fee distributed among several key players who facilitate the transaction:
	  ○ **The Issuing Bank**: This is the customer's bank.
	  ○ **The Acquiring Bank**: This is the merchant's bank.
	  ○ **The Payment System Operator**
	  ○ **The Payment Gateway**
	• To accelerate digital payments and promote financial inclusion, the government mandated a zero-MDR policy for all transactions conducted via UPI and RuPay debit cards, effective January 1, 2020. This policy prohibits business owners from passing MDR charges onto their customers.

3.3 ADDITIONAL TOPICS FOR READING FROM IASGYAN WEBSITE

Topic Name	Date
WHY AGRI INDUSTRIES ARE WARY ABOUT INDIA-US TRADE DEAL	25th June, 2025
INFLATION FALLS BUT NOT UNEMPLOYMENT	25th June, 2025
INDIA'S CRITICAL MINERALS STRATEGY	21st June, 2025
PRADHAN MANTRI AWAS YOJANA	20th June, 2025
WIND ENERGY IN INDIA	19th June, 2025
TRANSFORMING INDIA'S TRANSPORT INFRASTRUCTURE (2014- 2025)	12th June, 2025
INDIAN GARMENT INDUSTRY	11th June, 2025
AIMING FOR AN ERA OF 'BIOHAPPINESS' IN INDIA	5th June, 2025
SHOULD INDIA AMEND ITS NUCLEAR ENERGY LAWS?	7th June, 2025

4. DEFENSE & SECURITY

4.1 WOMEN CADETS FROM NDA

Context

- The first 17 women cadets to ever be admitted into the National Defence Academy graduated.
- The **Spring Term 2025 POP** stands as a proud testament to the **Academy's enduring commitment to grooming future military leaders**, now enriched with the inclusion of women cadets destined to serve the nation with honour and valour. The event held historical significance as it marked the passing out of the **first-ever batch of 17 Female Cadets from the Academy** — a transformative milestone in NDA's legacy of nation-building.

Background

This incident is an important step towards gender inclusion in the Indian Army. It also indicates breaking gender obstacles and sets an example for the future generations of women wishing to serve in India's defense services.

- In 2021, the **Supreme Court (SC) directed to accept women in the NDA.** Subsequently, 1 batch was admitted in 2022.
- **Pune (Maharashtra) NDA has a graduate school of Joint Services Training Academy** and Indian Armed Forces established in 1954 in Khadakwasla.
- It is the **first Tri-Seva Academy** in the world.

Significance of Women Participation in Defense forces

Dimension	Explanation	Example / Justification
Gender Equality	Provision of non-discriminatory opportunities in defence services aligns with constitutional rights.	Articles 14, 15, and 16 ensure equality before law, non-discrimination, and equal opportunity.
Talent Pool and Recruitment	Inclusion of women enhances the talent pool. Women today are capable of handling modern warfare technologies, especially in cyber and tech-based roles.	Cyber operations, UAV operations, and AI-driven weapon systems can be managed efficiently by trained women personnel.
Human Role of Defence Forces	Women soldiers can engage with the local population more effectively in areas where cultural or social norms restrict male access.	**Example**: Military Civic Action Program in insurgency-affected areas or disaster zones.
Humanitarian and Peace Campaigns	Women's involvement strengthens peacekeeping, community outreach, and civic engagement.	UN Peacekeeping Missions have shown higher acceptance and effectiveness with women personnel.

Arguments against the Women in Defense Sector

- **Physical training difference**: Critics argue that physical differences may require modifications in training programs.
- **Operating challenges**: There are concerns about logical adjustment, including infrastructure and deployment conditions.
- **Readiness of war**: Some believe that women may require additional policy adaptation to integrate in frontline fighter roles.
- **Cultural and Social Resistance**: Traditional mindset can face challenges in acceptance and integration within military ranks.

Steps for Incorporating Women in Defense Sector

Policy/Event	Year	Key Highlights	Significance
Agneepath Scheme	2022	Introduced short-term military recruitment for youth as **Agniveers**. - Included **women for the first time** in this recruitment program.	• Aims to modernize the armed forces. • Offers military training and career exposure to youth.
Supreme Court Verdict on Women	2020	Ruled in favor of **permanent commission** for women officers in the Indian Army. - Rejected gender stereotypes.	• Major step towards **gender equality** in the armed forces. Strengthened women's role in command.
Kargil Review Committee	1999	Recommended expanding women's roles in non-combat sectors like **logistics, engineering, and intelligence**.	• Recognized the **potential** of women in technical and support roles. • Guided defense reforms.
Parliamentary Standing Committee	Various	Advocated for **equal opportunities** for women. - Recommended improving **infrastructure in training academies** for better inclusion.	• Pushed for institutional changes to support women in defense. • Focused on long-term structural reform.

4.2 CHANGING GEOMETRIES OF BATTLEFIELD

Context

- Ukraine's Operation Spider's Web may have fundamentally transformed the geometry of the battlefield, and potentially changed the face of war for years to come.

Background

- Modern war is going through a seismic change. The most prominent drivers of this bounce have a exponential increase of autonomous arms systems (AWS) **including drones, missiles and robotics**. **Ukraine's recent "Operation Spider Web"**, which included launching inexpensive quadcopters from within Russia, marks a watershed moment in the development of military strategy, highlighting the untouchability of traditional air defense models.
- **India is also embracing this change**. The Indian drone market is estimated to increase to **$ 11 billion by 2030, with more than 12% of the global drone industry *(Drone Federation of India, 2024)*.** Meanwhile, initiatives such as **Operation Sindoor** displays India's commitment to integrate AWS in its strategic arsenal.

About Autonomous Weapons Systems (AWS)

- AWS refers to arms systems that **can choose and attach the target with minimal or no human intervention**. According to the ***UN Institute for Dismount Research (UNIDIR), more than 30 countries are currently developing AWS***. These systems expand a wide range of technologies and capabilities.

These are often classified:

Type of System	Description	Examples
Remotely Operated Systems	Controlled by human operators from a distance; decisions are made by humans.	Predator drone (USA), Heron drone (Israel/India)
Semi-Autonomous Systems	Capable of performing tasks once launched, but require human initiation.	Fire-and-forget missiles like BrahMos (India)
Fully Autonomous	Operate without real-time human control;	Loitering munitions with self-

Systems	use pre-programmed instructions.	targeting features

How these Systems are Changing Geometries of the Battlefield in Present Times?

- **From close matches:** In WWI machine guns, formed defensive deadlocks and forced to reconsider the attack strategy. During the WWII Blitzcrayg strategy, a combination of tanks, aircraft and artillery, ignoring static defense and emphasizing mobility.
    - Till the Cold War, the V -2 rocket marked the arrival of the long-range missile Warfare. Intercontinental ballistic missiles (ICBMS) redefined detention.
- **For remote strike:** AI-Saksham drone, cyber warfare and deep-stroke capabilities have changed the fight. From Syria to Nagorno-Karabakh and now Ukraine, drones have become the major tools of asymmetric war.
    - Ukraine's container-launched drone in **Operation Spider Web** is a textbook example of strategic surprise capable of technical decentralization.
- **Emergence of non-state actors**: Houthis in Yemen and Hezbollah in Lebanon have used Iranian drones to target sophisticated opponents. ISIS deployed commercial drones for IED delivery, redefining low-cost war.
- **Fall of traditional defense theory**: Ukraine's "Trojan Horse" style drone operation from within the Russian boundaries exposes weaknesses in stable air defense systems and increases the principle of decades.
- **India's response:** Operation Sindoor demonstrated India's Integrated Air Command and Control System (IACS) developed by BEL, which adds radar, missile system, and real-time data feed, which prevents air threats, including drones.

Significance of AWS for India

- **Strategic preventive and second-stroke capacity:** long distance drones and hypersonic weapons will increase India's atomic currency through second-stroke capabilities. **Systems such as Agni-V, Brahmos-II, and Loitering Munitions prevent traditional and asymmetric hazards.**
    - These flocks also support the dominance of non-atomic growth through drones. **Example: Agni-V and BrahMos-II expanded the preventive.**
- **Border Monitoring and National Security**: UAVs such as Heron, Rustom-II, and Tapas-BH million and LoC continuously monitor, especially after 2020 Galvan Clash.
    - These are important in difficult areas **in Ladakh, Arunachal Pradesh and Northeast.** After Galwan, India expanded the deployment of drones with borders.
    - **Example**: Tapas-BH deployed with Eastern Ladakh
- **Counter-Terrorism and Internal Stability:** Drone J&K and Naxalite affected areas in the Northeast and rebelly enabled accurate attacks in Hotbeds. AWS reduces collateral damage and human risk during operation. AI-operated drones provide real-time reconnaissance for surgical mission.
    - **Example: Drone kills top terrorist in Pulwama**
- **Disaster management and double use application**: Drone is deployed for flood mapping, earthquake rescue and disaster relief distribution. Their ability to reach dangerous or remote areas reduces the response time.
    - **In 2023, drones were important in the Odisha Cyclone withdrawal scheme.**
    - **Example: Drone used post-Odisha cyclone flood.**
- **Indigenous R&D and Economic Development**: India's drone sector is expected to reach $ 11 billion by 2030, which supports India. **DRDO's alpha-S, Hell's combat UAV, and startups** are making ideas innovations. The Drone Federation of India is collecting the expansion of the industry.
    - **Example**: **Drone Federation targets $ 11b market.**

Therefore, the future of war, not only on adopting these techniques but also on regulating them

responsibly. India stands at a significant turn, where its technical skills should be matched with strategic foresight. As the battlefield geometry transforms from trench lines to data currents, India's policies should keep pace to ensure peace, preparations and prosperity in the fast military world.

4.3 DRONES ARE THE NEW FACE OF WARFARE

Context

- The ubiquitous drone is rapidly becoming the weapon of choice in active combat, serving as a force multiplier to achieve strategic objectives while blurring the distinctions between military-grade and commercial technologies.

About India's Drone Warfare Strategy

- **Operation Sindoor, India's Operations**, was launched in response to the **Pahalgam terror attack**, which marks an important point in the country's adoption of unmanned air vehicles (UAVs) in active combat.
- This represents a comprehensive strategic change not only for monitoring but also combined with global military innovations in modern war, but not only for monitoring but also for using drones for standoff aggressive missions.
- From **Nagorno-Karabakh's battlefields** to the ongoing Ukraine struggle, drone forces have emerged as multiple, re-defining the nature of aerial war and providing lessons for India's developed currency.

About Drones

- Drones, or Unmanned Aerial Vehicles (UAVs), are aircraft operated without a human pilot onboard, controlled remotely or autonomously via AI.

Types

Type of Drone	Purpose	Examples
Surveillance Drones	Used for intelligence, surveillance, and reconnaissance (ISR) missions to monitor enemy movement.	Heron, Searcher (used for border patrolling and tactical surveillance)
Combat Drones (UCAVs)	Armed drones are capable of precision strikes without endangering pilots.	Heron TP, MQ-9 Reaper (carries missiles for surgical operations)
Loitering Munitions	Drones that hover before self-destructing on target; ideal for high-value attacks.	Harpy, Nagastra-1 (target radar systems and mobile missile units)
Swarm Drones	Multiple drones operated via AI coordination to saturate defences and confuse radars.	—
Nano/Micro Drones	Extremely small drones for short-range, indoor, or urban surveillance tasks.	Black Hornet (used by infantry for room-to-room clearance and intelligence)

Key Features of Modern Military Drones

- **Silent and AI Integration**: DRDOs such as drone aura use radar-illegal design with Aura for target identification.
- **EO/IR sensors and data links**: Electro-optical and infrared sensors offer day and night monitoring, which is connected to ground stations.
- **Long distance, high-tendency**: The drone range varies from more than 7,000 km with a flight of a few km to more than 7,000 km.

Drone roles in modern war

- **Renewing and accurate attacks:** Mix the capabilities of observation and attack to eliminate specific hazards. **E.g. Reaper Drone**

targeted the normal Soleman of Iran without collateral damage.

- **Electronic and Tactical Warfare**: Loitering drones can suppress air protection, and other people can block enemy signs.
- **Logistics and convoy support**: For drone hazards, the convoy may leave the supply or scout ahead.
- **Psychological and field denial**: Continuous drone appearance can reduce enemies and movement. **E.g. The Ukraine-Russia was seen in the war drones** were used to dominate no-man's-land regions.

Challenges in Drone Warfare

- **Counter-drain weaknesses**: The drone can be easily jammed, or easily shot using electromagnetic or kinetic counterparts.
- **High attraction in conflict**: Drone survival is low when facing layered rescue with radar-directed interceptors.
- **Citizen misuse risk**: drones are easily accessible and may be armed by terrorists or rebel groups.
- **Regulatory and Aircraft Interval**: India's drone laws still lack a clear mechanism for uninterrupted citizen-monetary coordination.
- **Slow domestic production**: inconsistent procurement discourages private drone manufacturers from scaling operations.

Way Forward

- **Drone Swarm development**: Accelerate indigenous flock drone technology using AI coordination for aggressive and defensive OPS.
- **Integrated air defense**: expand radar-drain integration under IACCS and to pre-discharge and neutralize drone hazards.
- **Indigenous ecosystem push**: promote startups such as Idea Forge and Solar Industry through fast-track defense procurement.
- **Mass Production Infrastructure**: Enable scalable drone production using modular 3D printing and dual-use industry support.
- **AI and Autonomous Upgrade**: Invest in autonomous navigation, terrain-migration, and EW resilience defense.

To maintain its drone ambitions for India, the **Ministry of Defense (MOD)** must streamline the purchase processes, address the **uncertainties of demand, and encourage domestic manufacturers** to increase. Without structural reforms in defense procurement, India risks being reduced from the needs of operations in fast-moving modern conflicts.

4.4 NUCLEAR WARHEADS SIPRI REPORT

Context

- The Stockholm International Peace Research Institute reports on nuclear arsenal expansion in India and Pakistan, warning of a dangerous arms race and crisis potential.

About SIPRI Yearbook 2025:

Country	Details
India	• **Total Warheads**: 180 (as of Jan 2025) • **Modernization**: Developing canisterised missiles with MIRV capability • **Triad**: Mature triad (land, air, sea-based systems) • **Strategic Shift**: Indications of mating warheads with launchers in peacetime
Pakistan	• **Total Warheads**: 170 (as of Jan 2025) • **Trends**: Expanding fissile material production, new delivery systems • **Strategy**: India-centric, focus on short-range tactical nuclear weapons

China	• **Total Warheads**: 600 (growing by ~100/year since 2023) • **ICBM Silos**: ~350 silos built in desert and mountain bases • **Posture Shift**: Likely peacetime deployment of warheads on missiles
Global Trends	• **Total Warheads Globally**: 12,241; ~9,614 in military stockpiles • **Top Holders**: Russia (5,459), USA (5,177) – over 90% combined share • **High Alert Warheads**: ~2,100 on high operational alert • **Modernization**: All 9 nuclear powers upgrading arsenals • **Arms Control**: New START expires in 2026; no successor treaty in place

Concerns

- **Arms control weakening**: No major nuclear powers are committed to complete disarmament.
  - The era of cuts in the global arsenal may end.
  - China is continuously increasing its nuclear force and can reach 1,000 warheads within 7-8 years.
- **All nine atomic-skilled states** invested heavily in modernization in 2024, **including**: upgraded systems, new technologies **(e.g., MIRVs, canisterisation, AI-based commands and controls).**
- **New nuclear states**: National debate in East Asia, Europe, and the Middle East about atomic status and strategy has been revived, suggesting that more states have some ability to develop their nuclear weapons.
- **Russia and the USA constitute about 90% of all nuclear weapons.**
  - Both states are **implementing extensive modernization programs** that can increase the size and variety of their arsenal in the future.
  - If no new agreement is signed to cap **their stockpiles**, the number of warheads deployed on strategic missiles is likely to increase in February 2026 after the bilateral 2010 treaty on **Further Reduction and Limitation of Strategic Offensive Arms (New START)** and boundary measures.

India's Strategic Focus

India's nuclear weapons support a mature nuclear triad containing aircraft, land-based missiles, and SSBN.

- **Traditionally, India stored separate atomic warheads** from the launcher during peacetime.
- Recent strategies, such as placing missiles in canisters and sea-based patrolling, indicate a change towards mating warheads with launchers in peacetime.
- **While Pakistan remains an important focus**, India is emphasizing long-distance weapons capable of targeting China.

ABOUT SIPRI

- SIPRI is an **independent international institute** dedicated to research into conflict, armaments, arms control, and disarmament.
- **Established in 1966**, SIPRI provides data, analysis, and recommendations, based on open sources, to policymakers, researchers, media, and the interested public.

4.5 SHORT ARTICLES

FPV Drones

Context

- Recently, Ukraine used first-person-view drones to attack Russia and destroyed more than 40 planes.

About First-Person View Drones:

Definition of FPV Drones

- First-Person View (FPV) drones are small, unmanned aerial vehicles that provide real-time video feeds to the operator, allowing precise control.

View Mechanism

- The operator sees what the drone sees through cameras mounted on the drone. The

video is displayed via special glasses, smartphones, or screens.

Usage of Reconnaissance Drones

- A larger drone is first sent to scout and identify the target area. It helps in locating and confirming the specific area to be engaged.

Range of FPV Drones

- FPV drones usually operate within a short range of a few kilometers.

Functionality

- These drones can navigate obstacles and perform operations like surveillance, monitoring, and search-and-rescue missions.

Control and Maneuvering

- FPV drones are manually operated with real-time visual input, allowing for precise and responsive movement.

Features of First-Person View Drones:

- **GPS-independent navigation**: operates without relying on satellite-based GPS, increasing flexibility against jamming or signal loss.
- **SmartPilot System:** Uses advanced visual-high navigation, explaining camera data to determine the situation and movement.
- **Lidar Technology:** LiDAR Technology complements the smartPilot system, increases accuracy in a complex or disorganized environment.

Offshore Security Coordination Committee (OSCC)

Context

- The Indian Coast Guard (ICG) chaired the 137th meeting of the Offshore Security Coordination Committee (OSCC) in New Delhi on June 12, 2025.

About Offshore Security Coordination Committee (OSCC):

- **Established:** 1978
- **Purpose:** Ensure effective offshore security arrangements

Key Functions:

- Policy formulation and guidance on offshore defence
- Identification of peacetime threats (e.g., terrorism, sabotage)
- Contingency planning across multiple agencies
- **Formation Context:** Rising threats to offshore oil & gas infrastructure
- **Chairperson:** Director General, Indian Coast Guard (ICG)
- **Current Relevance:** Increased responsibility due to expanding offshore oil & gas operations and emerging threats like illegal fishing near platforms.

Silver notice

Context

The Central Bureau of Investigation (CBI) has filed a chargesheet against eight individuals, including a local law officer at the French Embassy in New Delhi.

What is Silver Notice?

Launched In

- 2023 (Pilot phase)

Pilot Duration

- 2023 to 2025

Background

- Initiated after consultations during the **2022 United Nations General Assembly.**

Participating Countries

- 52 countries, including **India**

Purpose

- Identification and **recovery of criminal assets** linked to illegal activities

Key Features

- Traces **laundered assets**: properties, vehicles, bank accounts, businesses- Helps share information across jurisdictions.

Applicable Crimes

- **Fraud**
- **Corruption**
- **Drug trafficking**
- **Environmental crimes**

Utility

- Enables member countries to **request and exchange information** on assets tied to criminal activities.

Significance

- Enhances global cooperation in tracking and seizing **illicit wealth and assets**, boosting efforts against **money laundering and corruption.**

INTERPOL Notices:

Notices can be requested by

- Interpol National Central Bureau (BHARATPOL in India).
- United Nations, International Criminal Tribunal, and International Criminal Court.
- India has launched the 'BHARATPOL' portal to increase the efficiency of Indian investigative agencies.

ABOUT INTERPOL

- Interpol, formally known as the International Criminal Police Organization, is an intergovernmental organization with 194 member countries.
- Established in 1923, its primary objective is to facilitate international cooperation between national police forces in combating transnational crimes.

Aircraft Accident Investigation Bureau (AAIB)

Context

- A tragic Air India aircraft crash near Ahmedabad airport has prompted the Aircraft Accident Investigation Bureau (AAIB) to launch a formal probe, following global ICAO standards.

About Aircraft Accident Investigation Bureau (AAIB):

- **Type**: Statutory Investigative Body
- **Established On:** 30 July 2012
- **Headquarters:** New Delhi
- **Parent Ministry**: Ministry of Civil Aviation
- **Legal Basis**: Aircraft (Investigation of Accidents and Incidents) Rules, 2017
- **Global Linkage**: Annex 13 of the Chicago Convention (1944), under ICAO
- **Jurisdiction**: Indian airspace and Indian-registered aircraft

Scope of Investigation:

- Aircraft with **All-Up Weight (AUW) > 2,250 kg**
- **All turbojet aircraft**
- Other cases if **public safety** requires

Core Functions:

- Investigates and classifies **accidents, serious incidents, and incidents**
- Prepares and submits **final public reports**
- Sends **safety recommendations** to DGCA and foreign regulators
- Conducts **aviation safety studies**
- Provides **legal support** under Rule 12 of 2017 Rules

Report Submission:

- Final reports approved by **Director General**
- Shared with **ICAO and concerned States**
- **Safety Recommendations**: Sent to relevant **domestic and foreign aviation regulators** for systemic improvements
- **Legal Support**: Assists **courts and assessors** as mandated under the Rules.

'Bunker-buster' MOP and B-2

Context

- America has entered Israel's war with Iran, attacking a major underground nuclear facility that Israel cannot penetrate.

About Operation Midnight Hammer:

- A classified **American military airplane targeting Iran's major** nuclear facilities with accurate weapons.
- **Launched by:** US Department of Defense.
- **Objective**: To severely degrade the infrastructure of Iran's nuclear weapons and demonstrate American strategic air power.

Weapon used:

- **B-2 Spirit Stealth Bombers GBU-57A/B** with large-scale Ordnance Marmist (MOP).
- The Tomahawk Land **Attack Cruise Missiles** were launched from an American submarine.
- Decoy aircraft and support fighter jets for air defense suppression.

About Bunker-Buster MOP (GBU-57 Massive Ordnance Penetrator)

Type

- Non-nuclear, bunker-buster bomb

Developer

- Boeing, developed post-Iraq invasion

Purpose

- To destroy deeply buried, fortified underground facilities

Penetration Capability

- Up to 60 meters (approx. 200 feet) of earth

First Known Use

- In recent U.S. airstrikes on Iran's **Fordow nuclear facility**

B-2 Spirit Stealth Bomber

Type
- Long-range, stealth strategic bomber

Primary Role
- Deep-penetration strike missions with heavy payloads including nuclear and bunker-buster bombs

Stealth Capability
- Designed to evade radar and advanced air defense systems

Operational Use
- Exclusively used by the U.S. Air Force

Compatibility
- Only aircraft currently capable of deploying the GBU-57 MOP

Significance
- Key asset in global strike missions targeting high-value fortified or strategic facilities.

4.6 SNIPPETS

Topics	Details
Operation Spider's Web	• Ukraine executed Operation Spider's Web, its largest drone offensive, destroying $7 billion worth of Russian aircraft. • **Ukraine's Security Service (SBU)** executed a high-risk, long-range drone offensive targeting major Russian airbases using 117 **explosive-laden drones launched from civilian trucks disguised as wooden sheds.** • Planned over 18 months, the Trojan Horse-style operation struck deep into Russian territory, damaging strategic bombers at bases like **Belaya, Olenya, and Diagilevo**. • The attack, timed just before a Russian missile strike on Dnipropetrovsk, showcased Ukraine's deep-strike capabilities and aimed to strengthen its position in upcoming peace negotiations.
MSC Irina	• The world's largest container ship, MSC Irina, is set to make its maiden call at the Vizhinjam port, Kerala. • **It is the first time a range of MSC Irina, MSC Irina-Class**, a range of six identical ultra-big container vessels (ULCV), sailing on the banks of a South Asian port. **Features** **Ship Type** • Container Ship **Year Built** • 2023 **Flag** • Liberia **Owner/Operator** • Mediterranean Shipping Company (MSC), Switzerland **Class** • Irina-Class **Decks** • Up to 22 **Previous Record-Holder** • OOCL Spain (approx. 150 TEU less than MSC Irina) **Green Shipping Features** • Air lubrication technology • Energy-efficient propellers

	• Advanced hull design **Environmental Impact** • Reduced fuel consumption and lower carbon emissions **Notability** • Largest and one of the most eco-friendly container ships in the world.
Ice breaker	• The Indian Air Force (IAF) is considering the acquisition of Israel's advanced air-launched cruise missile, the 'Ice Breaker. **Type** • Long-range, autonomous, precision-guided missile **Developer** • Rafael Advanced Defense Systems (Israel) **Platform Compatibility** • Jet fighters, light attack aircraft, helicopters, small maritime vessels, ground vehicles **Speed** • High subsonic **Seeker Type** • Advanced electro-optical seeker (all-weather capability) **Targeting Intelligence** • Artificial Intelligence for target recognition and selective engagement **Stealth Feature** • Very Low Observable (VLO); terrain hugging/sea-skimming flight **Operational Flexibility** • Autonomous and man-in-the-loop modes **Multi-Missile Coordination** • Capable of synchronized attacks with multiple missiles **Deployment Advantage** • Compact and lightweight design
Khaan Quest	• The Indian Army contingent reached Ulaanbaatar, Mongolia for the Multinational Military Exercise KHAAN QUEST, which is scheduled to be conducted from 14th to 28th June 2025. • **Exercise Khaan Quest** is a multinational military exercise aimed at enhancing peacekeeping capabilities and interoperability under UN Charter Chapter VII. **The 22nd edition was held in Mongolia in 2024. Initiated in 2003 as a bilateral drill between the USA and Mongolia**, it became multinational in 2006. • India participated with 40 personnel from the **KUMAON Regiment and other units**, including one woman officer and two women soldiers. Key features include joint planning, tactical drills, and sharing TTPs.
Shahed drone	• Russia has likely used a new jet-powered attack drone, the Geran-3, in a recent missile and drone strike on Kyiv. **Origin** • Iran **Manufacturer** • Shahed Aviation Industries **Alternate Name** • Shahed-136 known as "Geran-2" in Russia **Type** • Unmanned Combat Aerial Vehicle (UCAV) / Loitering Munition

	Primary Use • One-way attack missions; detonates on impact **Design** • Delta-wing structure **Range** • 1,000 to 2,500 km **Speed** • Up to 185 km/h **Launch Mechanism** • Disposable rocket booster; powered by piston engine **Sound Signature** • Distinctive "moped-like" engine sound **Guidance System** • Pre-programmed GPS or GLONASS; resistant to jamming **Advanced Features** • Some variants use AI and algorithms for better navigation and targeting **Warhead Types** • High-explosive fragmentation, thermobaric, shrapnel-filled munitions **Target Impact** • Maximised damage to both personnel and equipment
Exercise Shakti	• India-France joint military Exercise Shakti 2025 to be held from June 18 in La Cavalerie. **Details** **Participants** • India and France **Frequency** • Biennial (every two years) **Hosting Pattern** • Conducted alternatively in India and France **Current Edition** • 8th edition **Last Held In** • India **Aim** • Enhance joint military capability for Multi Domain Operations in a Sub Conventional scenario **Objectives** • Develop interoperability • Foster bonhomie and camaraderie • Share best practices in joint operations **Other India-France Joint Exercises** • **Exercise Desert Knight** (Air Force) • **Exercise Varuna** (Navy) • **Exercise Garuda** (Air Force)
PASSEX	• The Indian Navy and UK Royal Navy conducted a Passage Exercise (PASSEX) in the North Arabian Sea. **Definition**

	• Joint naval drills conducted between friendly navies during deployment transits to enhance interoperability and coordination. **Host Location** • North Arabian Sea **Geostrategic Importance** • Critical for global maritime trade routes and regional security **Participating Nations** • India and United Kingdom **Indian Assets** • INS Tabar (stealth frigate), a conventional submarine, P-8I maritime patrol aircraft **Objectives** • Strengthen India-UK naval interoperability • Enhance anti-submarine warfare (ASW) coordination • Tactical manoeuvres- Maritime domain awareness • Share best practices and expertise • Uphold Indo-Pacific security commitment **Key Features** • Helicopter control and fleet movement drills • Joint ASW operations (air, surface, subsurface integration) • Officer exchanges • Real-time encrypted tactical data sharing • Communication protocol testing **Strategic Importance for India** • Boosts India's defence diplomacy in Indo-Pacific • Advances India-UK 2030 Roadmap goals • Supports SAGAR vision for regional maritime cooperation
Rudrastra	• The Indian Army successfully conducted trials of the Rudrastra hybrid Vertical Take-Off and Landing (VTOL) UAV in Pokharan, Rajasthan. • **Hybrid VTOL UAV by SDAL**: Developed by Solar Defence and Aerospace Limited (India), this **indigenous hybrid VTOL UAV is designed for anti-personnel deep-strike missions** using precision airburst munitions. • It combines **rotor-based vertical lift with fixed-wing cruise, has a range of over 170 km**, real-time surveillance up to 50+ km, and fully autonomous navigation with return-to-base capability. • It serves as a stand-off weapon, enhancing operational flexibility and promoting defence self-reliance.
ET-LDHCM	• India is preparing to test its most advanced indigenously developed hypersonic missile — the Extended Trajectory-Long Duration Hypersonic Cruise Missile (ET-LDHCM). **Overview** • Flagship missile system under **Project Vishnu** **Speed and Range** • Reaches **Mach 8 (~11,000 km/h)** with a strike range of **1,500 km**; nearly impossible to intercept with current defence systems **Payload Versatility** • Can carry **1,000–2,000 kg** of **conventional or nuclear warheads**; allows mission-specific configurations

	Propulsion • **Indigenously developed scramjet engine**; uses atmospheric oxygen for combustion — enhances fuel efficiency and endurance **Strike Capabilities** • Evasive manoeuvrability and flat trajectory make it suitable for **deep-penetration and precision attacks** **Next-Gen Materials** • Constructed with materials that withstand **2000°C+** temperatures, ensuring **oxidation resistance** and **structural integrity** **Launch Platforms** • Compatible with **land systems**, **fighter jets**, and **naval vessels** — offering high **operational flexibility**
Cyber Suraksha	• 'Cyber Suraksha', a comprehensive Cyber Security Exercise organised by Defence Cyber Agency under the aegis of Headquarters Integrated Defence Staff, commenced on June 16, 2025. • **Cyber Suraksha** is a multi-phased initiative by the Defence Cyber Agency to boost national cyber resilience. • It includes training, performance evaluation, and leadership engagement through gamified, real-world cyber threat simulations. • The program enhances analytical and defensive skills, promoting a proactive cybersecurity culture.
INS Arnala	• The Navy is set to induct 16 indigenously designed and built Anti-Submarine Warfare Shallow Water Craft class of ships, starting with INS Arnala. • **INS Arnala** is the first of 16 Anti-Submarine Warfare Shallow Water Crafts (ASW SWCs) built by GRSE, Kolkata, in partnership with L&T. • Named after Arnala Fort in Maharashtra, it is the largest Indian Naval warship with a diesel engine–waterjet propulsion. • Equipped with sonar systems like **Abhay and LFVDS, it performs sub-surface surveillance, SAR, and LIMO operation**s. • It replaces Abhay-class corvettes and will form a coastal ASW shield to protect India's 16 major ports, enhancing coastal defence and promoting Aatmanirbhar Bharat.
Ottowa convention	• Finland's parliament voted in favour of withdrawing the country from the Ottawa Convention that bans the use of anti-personnel landmines amid concerns over a military threat posed by neighbouring Russia. • **Anti-Personnel Mine Ban Treaty (Ottawa Treaty)**: A legally binding international agreement adopted in 1997 **(in force since 1999) to eliminate anti-personnel landmine**s. • It bans use, stockpiling, production, and transfer of such mines and mandates victim assistance and mine clearance. • As of 2024, 164 countries are signatories; **India, USA, Russia, China, and Israel are non-signatories due to security concerns**. • In 2025, **Poland, Finland, Lithuania, Latvia, and Estonia announced withdrawal** citing deterrence needs against Russia. Norway continues its support for the treaty.
INS Tamal	• Tamal will join the 'Sword Arm' of the Navy, the Western Fleet, under the Western Naval Command and is the second ship of the Tushil Class. • The second **Tushil-class stealth frigate**, built in Russia, is a multi-role warship with

	26% indigenous components, including BrahMos missiles. • It features advanced **sensors, EW systems, and supports helicopter operations, marking the last foreign-built** warship before India's full shift to indigenous naval production.
INS Nilgiri	• INS Nilgiri, the first of the indigenously built Project 17A stealth frigates, arrived at Visakhapatnam • **INS Nilgiri** is a Project 17A stealth frigate of the Indian Navy with advanced sensors, Barak-8 and BrahMos missiles, and a CODAG propulsion system, designed for independent and task force operations under Eastern Naval Command.
Tomahawk	• The Tomahawk missile is a long-range, all-weather, subsonic cruise missile primarily used by the United States Navy and Royal Navy. • **Tomahawk Missile** is a long-range U.S. cruise missile (up to 2,400 km) used for precision strikes on fixed targets, featuring low-altitude flight, stealth capabilities, and both conventional and nuclear payload options.

4.7 ADDITIONAL TOPICS FOR READING FROM IASGYAN WEBSITE

Topic Name	Dates
STEPPING UP NAXAL FIGHT, CARRYING ON WELFARE PUSH	11TH June 2025
OPERATION MIDNIGHT HAMMER	26TH June2025
ADAMYA	30TH June2025

5. ENVIRONEMT & ECOLOGY

5.1 SEASONAL RHYTHMS OF EARTH

Context

- The impacts of shifting seasons can cascade through ecosystems, with widespread repercussions that put species and ecosystems at risk the world over.

About Seasonality

- Seasonal rhythms shape life on Earth, guiding plant growth, animal migration and human traditions. Climate change and human activities are disrupting these cycles—humans can adapt behaviorally, but most species struggle to adjust or evolve quickly enough.

About Human-Induced Disruptions to Seasonal Cycles

- Recent decades have seen an alarming alteration in these age-old cycles. While some changes are global—driven primarily by climate change—others are localized. **Examples include:**
  - **Dam construction**, which disrupts natural river flows and flood regimes;
  - **Deforestation**, which affects the onset and intensity of rainfall;
  - **Urbanization and land-use changes**, which alter local temperature and humidity patterns.
- In addition to these, **climate change** is systematically modifying the timing and intensity of snow cover, glacial melt, rainfall and temperature—causing widespread ecological consequences.

Ecological Impacts of Shifting Seasonality

- **Phenological Mismatches**: Disrupted timing between species (e.g., plants and pollinators, plankton and fish larvae) threatens food webs and ecosystem services.
- **Behavior& Reproduction Shifts**: Seasonal cues for breeding and migration in birds, insects and amphibians are changing, risking population declines.
- **Vegetation Dynamics**: Altered rainfall and temperatures shift greening/browning patterns, impacting carbon storage and energy balance.
- **Evolutionary Stress**: Species adapted to past seasonality (e.g., snowshoe hares) face survival threats as environmental cues change.

Cascading Effects on Ecosystem Functioning

- The disruption in timing does not remain limited to individual species. It propagates across trophic levels and ecological networks, influencing:
  - **Food web stability**,
  - **Nutrient cycling**,
  - **Carbon sequestration capacity**, and
  - **Resilience against invasive species**.
- Even human sectors like **fisheries, agriculture and tourism** are vulnerable to these shifts**. For example**, a **mismatch between plankton availability** and fish spawning may impair commercial fish stocks.

Towards Better Preparedness and Adaptation

Effective responses to shifting seasonality require an integrated framework involving:

- **Ecological research** to understand species-specific thresholds and responses,
- **Policy support** for protecting habitats and corridors vital for migration and adaptation,
- **Technological interventions** for precision agriculture and conservation.

5.2 SEABED MINING AND CCZ

Context

- The Metals Company, a Canadian deep-sea minerals exploration firm, applied to the United States for permits to mine the Pacific seabed.

About Seabed Mining

- The term 'seabed mining' refers to the extraction of high-value commodities, such as metals or gemstones, from the seabed. The **term is used for both deep-sea and shallow-water mining activities** and thus encompasses a range of activities under different environmental and regulatory contexts.
- **Shallow-water mining is not strictly defined by depth**, **but** rather, shallow-water operations are usually considered to be **those occurring on the continental shelf with easier access to the coast**, as opposed to deep-sea operations that target less accessible resources and require specialized technology.

The main types of shallow-water minerals include

- Mineral rich sands;
- Polymetallic nodules and phosphorites; and
- Placer deposits, consisting of metallic minerals or gemstones, such as tin, gold, or diamonds.

Key Ecological Threats

Ecological Threat	Description	Ecological Impact
1. Benthic Habitat Destruction	Mining removes polymetallic nodules and scrapes seabed sediments.	~90% of abyssal species depend on nodules; recovery negligible even after 40 years.
2. Sediment Plume Impacts	Mining stirs sediments, creating plumes that spread widely.	Clogs filter feeders; disrupts visual/bioluminescent cues and carbon cycling.
3. Chemical Pollution & Toxic Release	Sediment disturbance releases toxic metals and sulfides.	Potentially severe effects on marine health and biogeochemical balance.
4. Noise, Light & Physical Disturbance	Mining generates noise and artificial light in deep-sea darkness.	Disrupts echolocation, mating and feeding in sensitive species.
5. Ecosystem Fragmentation & Biodiversity Loss	Mining fragments habitats and isolates populations.	Local extinction risk; loss of endemic species; breaks deep-sea ecological links.

Strengthening International Regulatory Frameworks

- **Enforce Binding Environmental Regulations**
  - Mandate baseline studies, EIAs, plume thresholds, contaminant limits and habitat restoration protocols.
  - Include adaptive management, independent audits and civil society oversight.
- **Implement a Global Moratorium**
  - Pause new mining/EIA licenses until regulations are finalized and knowledge gaps addressed.
  - Urge ISA members to support moratoriums under UNCLOS Article 206.
- **Align National Laws with ISA Norms**
  - Embed ISA standards and moratoriums into domestic law.
  - Ensure coordination between coastal and flag states to avoid regulatory evasion.

- **Mobilize Resources for Deep-Sea Research**
  - Prioritize funding for studies on ecology, plumes and pollutants (e.g., Clarion–Clipperton Zone).
  - Create open-access biodiversity databases aligned with SDG 14.

5.3 HAS THE ENVIRONMENTAL CRISIS IN INDIA EXACERBATED?

Context

- As we observe June 5 as World Environment Day, one takes stock of how the previous decade has exacerbated/mitigated existing environmental crises.

About Major Environmental Crises in India and the World:

Attribute	Details
Triple Planetary Crisis	The world is facing three **interconnected environmental crises**: 1. Carbon Emissions 2. Biodiversity Loss 3. Pollution
Rising Carbon Emissions	• Global CO_2 emissions rose by **~10%** (2015–2024): from **34.1 to 37.4** billion metric tonnes. • **India's emissions** rose from **2.33 to 3.12** billion metric tonnes due to coal and oil dependency.
Biodiversity in Danger	• India's biodiversity is threatened by: ○ **Deforestation** ○ **Wetland degradation** ○ **Monoculture expansion** ○ Result: Mass extinction and ecosystem disruption.
Frequent Pollution	• India faces **severe air pollution**. • **Delhi** remains among the world's **most polluted cities,** consistently topping global indices.

Causes of Environmental Degradation

- **Fossil fuel dependence**: Major sources of global carbon emissions. In India, **about 70% of electricity** is generated from coal. Emissions from power generation, transportation and industry are major contributors.
- **Forest harvesting and land use change**: Forest approval for **infrastructure projects (road, mining, dam)** is increasing. Biodiversity-rich areas such as the Western Ghats and the Northeast are the most affected.
- **Agricultural intensity**: The high-input monoculture by the agricultural business damages the ecosystem. Water bodies are polluted with nitrates, pesticides and plastic.
- **Waste mismanagement and urbanization**: Fast, uncontrolled urban development leads to irregular landfills and untreated sewage. Rivers like Ganga and Yamuna are heavy polluted. India **produces 62 million** tonnes of waste annually; **Only 20% are properly processed**.

Way forward

- **Global answer accountability**: Rich nations should significantly reduce emissions. Provide climate finance to developing countries. Eliminate outsourcing of polluting industries.
- **Corporate responsibility:** Apply strict environmental laws and apply carbon taxes. Market access ban for companies violating green policies. Promote corporate rearing for sustainable practices.

5.4 ROLE OF BESS IN SHAPING INDIA'S ENERGY TRANSITION

Context

- India has inaugurated South Asia's largest 20 MW **Battery Energy Storage System (BESS)** in Delhi.

What is India's Present Energy Status?

- India's energy sector is globally the most diverse, encompassing coal, oil, natural gas, hydroelectric, atomic, wind, solar and biomass energy sources. It is also **home to the third-largest energy and oil consumer, the fourth-largest refiner and LNG importer, more than 96,000 retail fuel outlets and a** 25,000 km gas pipeline network.

Key Policy Initiatives

- **SAUBHAGYA:** Electrified in more than 2 crore rural homes
- **Deen Dayal Upadhyay Gram Jyoti Yojana**: Electrified 18,374 Villages
- **PM-Surya Ghar: Muft Bijli Yojana**: To target roof solar installations in 1 crore homes with allocation of rupees. 20,000 crore rupees 2025-26 in budget
- **SATAT Plan:** Promoting compressed biogas (CBG); More than 100 plants were commissioned
- **Ujjwala Yojana:** Ensuring cheap LPG access.

Role of Battery Energy Storage Systems (BESS)

- BES provides a solution to the internal nature of renewable energy, increasing grid stability.
- BESS can integrate renewable items, **stabilize grids, balance demand-supply fluctuations** and manage the summit load.
- They are **inexpensive, scalable, rapidly deployed and geographically flexible**.
- Integration of BESS can significantly **reduce greenhouse gas emissions**.
- With a decline of an average battery cost in the last 15 years, the cost and the decline in progress has accelerated the BESS expansion.

Challenges and Opportunities in India

- India aims for **500 GW installed power capacity by 2030**, achieving 217.62 GW by 2025.
- The government has committed to deploy **47 GW BESS by 2032**.
- Challenges include grid upgrade, deployment speed, significant mineral access and investment requirements for delay in agreement.
- Innovative partnerships are important, **such as a $300 million platform for greenfieldprojects** and **EnerGrid, Greenfield Projects in Delhi.**

Way Forward

- **Diversity and decentralization in energy mixtures. Example: roof solar under PM Surya Ghar.**
- **Green hydrogen and battery storage push**: Scale up the National Green Hydrogen Mission and Pilot Corridor in **Panipat and Numaligarh**. Boost the battery energy storage systems (BESS) through the production-link incentive (PLI) schemes and PPP models. **Example: Panipat Green Hydrogen Project was scaled.**
- **Digitalization and AI-operated grid management**: AI tools such as GPP in Rajasthan increase demand, load balance and increase outage response. **Example: GEAPP Pilot in Rajasthan Grid.**

5.5 STATUS OF RENEWABLES IN INDIA

Context

- According to the Crisil Ratings, India is set to add 75 gigawatts (GW) of renewable energy in 2025-26 (FY26) and FY27, up 53 percent from 49 GW added in FY24 and FY25.

Importance of renewable energy

- **Climate change mitigation**: Fossil reduces dependence on fuel and reduces greenhouse gas emissions. As. India aims to cut carbon intensity by **45% by 2030**.
- **Energy Safety**: Reduction in dependence on coal imports from countries like **Australia, Indonesia etc.**
- **Sustainable Development Goals: Clean Energy (SDG 7), Climate Action (SDG 13),** including SDG, supports SDG.

Aspect	Details
Current RE Investment (FY24–25)	₹2.5 lakh crore
Projected RE Investment (FY26–27)	₹3.8 lakh crore (↑52%)
Key Driver	Capital-intensive hybrid projects
India's Total Installed Power Capacity (2025)	452.69 GW
Non-Fossil Fuel Share	~50% (incl. nuclear)
Renewable Energy Share	46.3%
RE Source-wise Capacity (GW)	Solar: 90.76, Wind: 47.36, Hydro (Large+Small): 52, Bio: 11.32
2030 RE Target	500 GW non-fossil capacity
Key Govt Schemes	Green Hydrogen Mission, PM-KUSUM, PM Surya Ghar, PLI for Solar PV
FDI Policy	100% under the automatic route
Infra Support	RE Parks, Project Development Cell, Green Energy Open Access Rules (2022)
Transmission Plan till 2030	Grid readiness for RE integration
Offshore/Wind Initiatives	37 GW target, Lease Rules (2023), Repowering Policy (2023)
RE Capacity Addition	FY24–25: 49 GW; FY26–27: 75 GW (↑53%)
Expected RE Capacity by FY27	233 GW
Hybrid + Storage Share	FY24–25: 17%, FY26–27: 37%
PPAs Finalized (past 1–2 yrs)	~50% (low DISCOM interest)
Planned FY26 Capacity by Source (GW)	Solar: 26.5, Wind: 6.3, Coal: 4.4, Battery: 3.3, Hydro: 1.6, Pumped: 1.5, Nuclear: 1.4

Renewable energy challenges

- **High cost**: high upfront investment for renewable energy infrastructure, such as solar panels, wind turbines and energy storage.
- **Environmental concerns**: adverse effects on biodiversity such as habitat loss, mortality of direct species, disturbances, etc.
- **Heritage infrastructure**: The existing fossil fuel-based infrastructure complicates integration with renewal.
- **Grid stability**: variability in solar and wind energy challenges grid stability.

Way forward

- **Green Energy Corridor:** Approved plans for a power transmission system in Ladakh to support 13 GW of renewable energy.
- **PLI Scheme Solar Cell Manufacturing:** The PLI scheme aims to boost production of high-efficiency solar panels with ₹19,500 crore in funding.

- **Solar Parks:** 50 solar parks approved, with a total capacity of about 37,490 MW.
- **PM KUSUM Scheme:** Expanded to install 49 lakh solar pumps, simplifying guidelines for land use.
- **Bioenergy:** Promoting biomass use, with new biogas plants and projects underway. The National Policy on Biofuels 2018 specifically promotes advanced biofuels to achieve a target of 20% blending of biofuels with fossil fuels.
- **Union Budget 2024 provisions:** Various incentives including exemption of **Basic Customs Duty (BCD)** on imports of 25 critical minerals important for the renewable energy sectors have also been announced.

5.6 SHORT ARTICLES

Clean Planet Program

Context

- The union government has launched the 'Clean Plant Programme' for grapes, oranges and pomegranates from Maharashtra.

About Clean Plant Programme

Initiative Objective

- Promote availability of **disease-free, high-quality planting materials** for horticulture crops (fruits, vegetables, flowers).

Goal for Farmers

- Improve **productivity and quality** by using **certified and clean planting materials**, reducing crop loss and increasing yield.

Component 1: Clean Plant Centers (CPCs)

- Establishment of **9 CPCs** for:
  - Disease diagnosis and treatment.
  - Developing mother plants.
  - Consolidating planting material supply.

Component 2: Infrastructure Development

- Large-scale nurseries to **multiply clean planting material**.
- Use CPC-developed mother plants for propagation and distribution to farmers.

Component 3: Regulatory Framework

- Establish **certification and regulatory mechanisms**.
- Ensure **traceability and accountability** in the planting material value chain.

Implementing Agencies

- **Ministry of Agriculture and Farmers Welfare**
- **National Horticulture Board (NHB)**
- **Indian Council of Agricultural Research (ICAR)**

State of India's Environment in Figures 2025

Context

- As the world prepares to observe Environment Day on June 5, the Centre for Science and Environment (CSE) has sounded a sobering alarm: India is facing a mounting crisis on multiple environmental and development fronts.

About Ocean Coordination Mechanism (OCM):

- **OCM Report by CSE-DTE** ranks 36 States/UTs across 48 indicators in environment, agriculture, public health and human development.
- **Top states** include Andhra Pradesh (environment), Sikkim (agriculture) and Goa (public health), but all show critical gaps like poor sewage, low female LFPR and weak welfare.
- **Key concerns**: India saw record heat in 2024, rising displacements (5.4 million), high GHG emissions (7.8%) and worsening pollution and waste crises.
- **Urgent action needed** to tackle the climate-health-economy nexus, improve data transparency and ensure inclusive, sustainable development.

BBX32

Context

- Researchers from the Indian Institute of Science Education and Research (IISER), Bhopal, have found that a single protein helps plants time their first step from darkness into light.

About BBX32 Protein:

- It is a **B-box protein** that helps regulate plant growth. It is identified by scientists at IISER, Bhopal.
- It helps provide leads to control the timing of seedling emergence and help maximize proper seedling establishment, thereby **enhancing crop yields** in areas prone to heatwaves during the Indian summer.
- It's important because young seedlings emerging out of the soil are extremely sensitive to environmental factors like heat, light and humidity, this translates into losses in crop yield in regions prone to heatwaves like **Vidharba in Maharashtra**.

United Nations Ocean Conference (UNOC3)

Context:

- Brazil and France launched an initiative to encourage ocean-focused action in national climate plans ahead of UNFCCC COP 30.

About United Nations Ocean Conference (UNOC):

What is UNOC?

- A major international forum supporting **SDG 14: Life Below Water**

Primary Focus

- Conservation and sustainable use of **oceans, seas and marine resources**

Stakeholder Participation

- Involves **governments, NGOs, academia, IGOs, private sector and Indigenous communities**

Key Themes

- Marine pollution, overfishing, climate change, habitat degradation, policy & finance efforts

Timeline of Conferences

- **2017**: New York (Fiji & Sweden)
- **2022**: Lisbon (Portugal & Kenya)
- **2025**: Nice (France & Costa Rica)
- **2028**: Planned in Chile & South Korea (official announcement pending)

Legal Framework

- Guided by the **UN Convention on the Law of the Sea (UNCLOS)**

Financial & Policy Impact

- Over **$130 billion mobilized** and **2,160+ voluntary commitments** since 2014

Sustainable Cities Integrated Pilot Approach Project

Context

- In the pursuit of a cleaner and greener India, the integration of electric vehicles (EVs) into household waste collection marks a transformative step under the Swachh Bharat Mission-Urban (SBM-U).

About the Sustainable Cities Integrated Pilot Approach Project:

- The project aims to address **UN-Habitat's commitments** to support the Government of India, integrating **urban infrastructure and service distribution in cities**, promoting permanent urban planning and management.
- **It helps 28 cities in 11 countries** to face challenges caused by megatrends of global environmental decline in an integrated way.
- **The primary objective** is to promote a favorable environment for investment in green infrastructure.
- The purpose of these investments is to **reduce greenhouse gas emissions**, increase **service distribution** and improve the overall quality of life for citizens.
- It is being implemented by the **United Nations Industrial Development Organization (UNIDO)** with funding assistance and close **collaboration with the Ministry of Housing and Urban Affairs from the Global Environmental Facility (GEF).**
- The implementation of the project is going on in five pilot cities- **Bhopal, Guntur, Mysore, Vijayawada and Jaipur.**

5.7 SNIPPETS

NATIONAL PARKS/SANCTUARIES/WETLANDS/RESERVES IN NEWS	
Topics	**Details**
Kumram Bheem Conservation Reserve	Telangana has declared a vital tiger corridor linking Kawal and Tadoba-Andhari reserves as the Kumram Bheem Conservation Reserve under Section 36(A) of the Wildlife Protection Act, 1972. This inter-state corridor enhances tiger movement, genetic diversity and long-term conservation.
Valley of flowers	The Valley of Flowers in Uttarakhand's Chamoli district, part of the UNESCO-listed Nanda Devi Biosphere Reserve, has reopened to tourists. Renowned for its alpine meadows, rare flora and endangered fauna, it lies between the Zanskar and Great Himalayan ranges.
Coringa WLS	Experts from WII have radio-collared endangered fishing cats for the first time in Coringa WLS, Andhra Pradesh. Located in the Godavari delta, this mangrove-rich sanctuary supports diverse species including otters, fishing cats and Olive Ridley turtles.
Khichan (Phalodi) and Menar (Udaipur) wetlands	The **Khichan (Phalodi)** and **Menar (Udaipur)** wetlands in **Rajasthan** have been declared **Ramsar Sites**, taking India's total to **91**—the **highest in Asia**. Rajasthan now has **four Ramsar sites**, including **Sambhar Lake** and **Keoladeo Ghana National Park**. **Khichan**, located in the **Northern Thar Desert**, is a **desert wetland ecosystem** known for hosting over **22,000 Demoiselle Cranes** annually. **Menar**, a **freshwater monsoon wetland**, is celebrated for its **community-led conservation**, protecting species like the **White-rumped vulture** and **Long-billed vulture**. These wetlands are examples of **ecotones**—transitional zones between **terrestrial and aquatic ecosystems**. The **Ramsar Convention**, adopted in **1971** at **Ramsar, Iran**, provides the global framework for **wetland conservation**. India joined in **1982**. Under the **Montreux Record** (list of threatened wetlands), India has two sites: **Keoladeo National Park** (1990) and **Loktak Lake** (1993). **Chilika Lake** was also once listed but was removed in **2002**, becoming the first Asian site to do so.
Tamhini WLS	Located in the Western Ghats near Pune, Tamhini WLS boasts evergreen to moist deciduous forests and rich biodiversity including teak, rosewood, Indian giant squirrel and Malabar Whistling Thrush. It is renowned for its scenic beauty and ecological diversit.
Surinsar-Mansar Wildlife Sanctuary	Spanning Jammu, Udhampur and Samba, this sanctuary surrounds the Ramsar-listed Surinsar and Mansar lakes. It harbors leopards, blue bulls and Chir Pine forests and plays a vital role as a catchment for the Tawi River.
Nandur Madhyameshwar Wildlife Sanctuary	A Ramsar site at the Godavari-Kadwa confluence in Nashik, it is dubbed the "Bharatpur of Maharashtra" for its wetlands and avian diversity, including migratory species like the Eastern Imperial Eagle and White Stork.
Kappatagudda WLS	Located in Gadag, it features dry deciduous forests and grasslands, with ~400 medicinal plants and carnivores like leopards and wolves. The area is also noted for Chalukyan temples and is called the "Western Ghats of North Karnataka."
Salkhan Fossil Park	This IUCN- and UNESCO-recognized geo-heritage site in Sonbhadra contains 1.4-billion-year-old stromatolite fossils, offering critical insights into the Earth's early biosphere and the Great Oxidation Event.

Male Mahadeshwara Wildlife Sanctuary	A key tiger corridor linking BRT, Cauvery and Sathyamangalam, it houses tigers, leopards and elephants. It is proposed to be upgraded to a tiger reserve, possibly making Chamarajanagar the first district with three tiger reserves.
Tral Wildlife Sanctuary	A crucial corridor for the endangered Hangul outside Dachigam NP, Tral WLS supports musk deer, vultures and medicinal plants. It connects to Overa-Aru and Kru, enabling landscape-level conservation.

SPECIES IN NEWS	
Topics	**Details**
Amolopsshillong	Newly discovered urban stream frog in Shillong, related to cave-dwelling A. siju, highlighting Northeast India's amphibian diversity.
Calotes zolaiking	A rare agamid lizard found in Meghalaya and Mizoram, about 5 inches long, with keeled scales and swift movement on land and water.
Caspian Gull	Rare migratory gull spotted in Kerala; breeds near water bodies and is among the rarest gulls seen in India.
Lady's-slipper Orchid	Rediscovered in the UK after 100 years; Indian species face threats from habitat loss and are protected under CITES and WPA.
Losgna occidentalis	First Indian record of this parasitic wasp genus in 60 years; found in Chandigarh, highlighting the importance of urban biodiversity.
Dugesiapunensis	New planarian worm species from Pune; capable of regeneration and the first such discovery in India since 1983.
Spathaspinanoohi	New beetle species from Meghalaya with a sword-like spine; plays a role in controlling invasive plant species.
Eurasian Otter	Semiaquatic, Near Threatened species once abundant in Kashmir; threatened by pollution and habitat degradation.
Ohler's Spiny Frog	Stream-dwelling frog from Vietnam; males have chest spines during breeding, highlighting Indo-Asian ecological significance.
Dragon's Prince (Khankhuuluumongoliensis)	New dinosaur species from Mongolia; precursor to T. rex, supporting the theory of Asian origins for tyrannosaurs.
Mouse Deer (Moschiola indica)	Small forest herbivore; recent successful zoo birth; important for seed dispersal and protected under WPA Schedule I.
Spartaeus and Sonoita	First-time record of these spider genera in India, expanding understanding of arachnid biodiversity.
AviList	First global unified bird checklist launched by IOU; aids in taxonomy, policy and biodiversity conservation.
Russell's Viper	Highly venomous Indian snake; new drugs (varespladib, marimastat) show promise in countering its venom in mice.

MISCELLANEOUS	
Topics	**Details**
Sindoor	• PM Modi planted a Sindoor sapling on World Environment Day in New Delhi. • **Bixa orellana (Annatto):** Tropical shrub native to Brazil; red seeds yield dye used in food (e.g., cheese, butter), cosmetics, textiles and paints; prefers warm, frost-free climates.
Waste Picker	• MoSJE launched the Waste Picker Enumeration App on World Environment Day

Enumeration App	2025. • **Namaste Scheme – Waste Picker App:** Aims to register 2.5 lakh waste pickers; provides health insurance, PPE, training, ID cards; promotes waste management via group formation and dry waste centers.
Northopegia	• 24-million-year-old fossil leaves discovered in Assam's Makum Coalfield. • **Nothopegia Genus:** Medicinal tropical trees of the mango family; now in Western Ghats; 23–24 Mya Assam fossils show ancient NE India presence and adaptation to warm, humid climates.
Palms Trees	• NGT seeks CPCB's reply on mass palm tree felling in Bihar. • **Arecaceae**: Evergreen monocot family of shrubs, trees, or lianas found in tropical regions; have tall, mostly unbranched stems with palmate or pinnate leaves; some (e.g., *Hyphaene*) show branching. • **Economic Importance**: Includes coconut and oil palm; ~100 species endangered due to deforestation and overuse.
India's 1st off-grid green hydrogen pilot plant	• Adani commissions India's first off-grid 5 MW green hydrogen plant in Kutch. • **Green Hydrogen Plant (Kutch, Gujarat)**: India's first 5 MW off-grid solar-powered green hydrogen plant by Adani; uses automated electrolyser and BESS in a closed-loop system; supports the National Green Hydrogen Mission.
Blowout	• Blowouts are costly, requiring expert teams and prolonged efforts to control. • A blowout is a type of accident that happens at a natural-gas or oil well when the underground pressure pushing gas upward suddenly overpowers the equipment meant to contain it.

5.8 ADDITIONAL TOPICS FOR READING FROM IASGYAN WEBSITE

Topic Name	Date
Black carbon	3RD June 2025
Flue Gas Desulphurisation (FGD)	5TH June 2025
Exposomics for Better Environmental Health	6TH June 2025
Agro terrorism	9th June 2025
Wildlife (Protection) Act, 1972	12th June 2025
Centre sanctions over 300 FRA cells	17th June 2025
Invasive alien species and trade tariffs UN Oceans Conference 2025	20TH June 2025
Nickel extraction	21ST June 2025
Enhanced Rock Weathering (ERW)	26TH June 2025
Integrated Biodiversity Assessment Tool (IBAT) Alliance Assisted pollination	27TH June 2025
Is India plumbing the depths of groundwater? Global energy CO2 emissions	28TH June 2025
Pilot scheme for managing human-tiger conflict	30TH June 2025

6. SCIENCE & TECHNOLOGY AND HEALTH

6.1 SHORT ARTICLES

Rinderpest

Context

- The World Organisation for Animal Health (WOAH) and the Food and Agriculture Organisation (FAO) have recognised the ICAR-National Institute of High Security Animal Diseases (NIHSAD) in Bhopal as a world-class facility for securely storing the Rinderpest virus.

About Rinderpest

- Rinderpest, also **known as "cattle plague,"** is a highly contagious and lethal viral disease.
- It **mainly affects cloven-hoofed animals**, with cattle and buffalo being the most susceptible.
- A virus **belonging to the Morbillivirus genus causes the disease**; this virus relates to the viruses that cause measles in humans and canine distemper in dogs.

Mortality and Transmission

- For cattle and buffalo, Rinderpest is deadly, resulting in mortality rates that can reach up to 100% in highly susceptible herds. While it can infect other animals like sheep, goats and various wildlife, they show milder symptoms.
- An infected animal either succumbs to the disease or recovers, gaining lifelong immunity and clearing the virus from its system.

Symptoms and Human Impact

- The classic signs in cattle include high fever, sores in the mouth, discharge from the eyes and nose and severe diarrhoea, which leads to dehydration and death, typically within 10 to 15 days.
- **Rinderpest does not infect humans and therefore poses no direct public health risk.** Its impact has always been economic, causing famine and disrupting agricultural societies by devastating livestock.

Global Eradication of Rinderpest

- In 2011, the WHO officially declared the world free of Rinderpest after a decades-long, coordinated global campaign led by the FAO and WOAH. This marked Rinderpest, only the second disease in history to be completely eradicated, following smallpox.
- Samples of the virus are still held in a few high-security laboratories. The accidental or deliberate release of this stored virus poses a catastrophic threat because global livestock populations are no longer vaccinated and possess no immunity. To mitigate this risk, the FAO and WOAH have implemented a strict framework that restricts the storage to a small number of approved, high-security laboratories.

Kruti

Context

- The recent launches of Krutrim's 'Kruti' and CoRover's 'BharatGPT Mini' mark a new phase in India's Artificial Intelligence (AI) journey.

About Krutrim's 'Kruti'

- AI startup Krutrim has introduced **'Kruti,' an advanced AI assistant that transcends traditional chatbot functionalities to embody what developers term "agentic AI."**
- Unlike conventional chatbots, which primarily deliver text-based responses to queries, an agentic AI functions as a proactive "doer." It understands a user's ultimate goal and autonomously executes multi-step tasks by integrating with various applications and services. For example, instead of only providing directions to an airport, an agentic AI like Kruti can proceed to book a cab for the user.

Key Features of Kruti

- **Action-Oriented Capabilities**: Kruti is engineered to perform concrete actions such as booking cabs, ordering food, paying bills and generating images, moving beyond simple question-answering.
- **Multilingual Support and Mobile Optimization**: It operates in 13 Indian

languages, making it accessible to a diverse linguistic population across the country.

- **App Integration**: Kruti integrates with various applications, reducing the need for users to switch between different services to complete a single task.

About CoRover's 'BharatGPT Mini'

- CoRover has launched **'BharatGPT Mini,' a Small Language Model (SLM) engineered to democratise AI access**, particularly in environments with limited resources.
- SLMs are compact versions of Large Language Models (LLMs) such as GPT-4. Developers train them on smaller, often more specialised datasets, which make them faster and more cost-effective to operate.

Key Features of BharatGPT Mini

- **Hardware Efficiency**: It operates efficiently without requiring high-end hardware or extensive cloud infrastructure, making AI more accessible to a wider user base.
- **Offline Functionality**: The model works offline, by processing data directly on the device, it also enhances user privacy, as sensitive information does not need to be transmitted to cloud servers.
- **Multilingual Support**: BharatGPT Mini supports text-based tasks in 14 Indian languages.
- **Domain-Specific Solutions:** While LLMs excel at complex, general-purpose tasks, SLMs like BharatGPT Mini provide rapid and efficient solutions for specific domains such as banking, healthcare, or government services, offering specialized performance where large-scale general knowledge is not always necessary.

Electricity Generating Bacteria

Context

- Scientists at Rice University have discovered that certain bacteria can "breathe" electricity instead of oxygen.

Extracellular Respiration

- Normally, living organisms, including humans, require oxygen to metabolize food and generate energy through cellular respiration. However, **these newly discovered bacteria utilize a unique mechanism called extracellular electron transfer (EET).** They push electrons out of their cells onto external surfaces, such as metals, thereby creating an electric current.
- These bacteria **utilise special molecules called naphthoquinones, which act as "electron couriers."** These couriers promote the transfer of electrons from inside the bacterial cells to outside surfaces. The continued flow of electrons mimics the operation of a battery, to enable the bacteria to generate energy without the presence of oxygen.

Significance of This Discovery

- **Renewable Energy from Waste:** This discovery paves the way for advanced Microbial Fuel Cells (MFCs), which can harness the metabolic activity of these bacteria to convert organic waste, such as sewage or farm waste, directly into electricity.
- **Fighting Climate Change:** These electricity-generating bacteria can utilize carbon dioxide (CO_2) in a manner similar to how plants perform photosynthesis, converting it into energy. This process offers a cleaner, potentially carbon-neutral alternative to traditional fossil fuels, contributing to efforts to mitigate climate change.
- **Bioremediation (Cleaning Pollution):** Bacteria can convert highly toxic metals, such as arsenic or mercury, into less harmful or immobile forms by promoting electron transfer to these contaminants. This property makes them useful for cleaning contaminated soil and water bodies, providing an eco-friendly solution to industrial pollution.
- **Bioelectronic Sensors:** Because these bacteria function effectively without oxygen, they are ideal candidates for various bioelectronic applications. They can be integrated into:
  - **Medical sensors**: For detecting conditions like gut infections where oxygen levels are low.
  - **Environmental monitors**: For tracking pollution levels in rivers and other aquatic environments.

- **Space missions**: Ability to survive and operate in harsh, oxygen-free conditions makes them invaluable for sustaining life support systems or developing sensors for extraterrestrial exploration on planets like Mars.

Biostimulants

Context

- The government has registered 34 new biostimulants to strengthen agri-input manufacturing within India and position the country as a leading exporter in the global biostimulant market.

What Are Biostimulants?

- Biostimulants are **specialized substances that enhance plant growth and resilience, particularly under challenging environmental conditions like drought or heat.** They differ from traditional fertilisers, which directly supply essential nutrients such as nitrogen or phosphorus.
- It **improves a plant's inherent ability to absorb nutrients already present in the soil.** They strengthen plants against various stresses, including extreme weather fluctuations or pest infestations.
- By promoting plant growth and enhancing crop quality, biostimulants contribute to increased yields without heavy reliance on chemical inputs.
- The Ministry of Agriculture and Farmers Welfare regulates biostimulants under the Fertiliser Control Order (FCO) of 1985, to ensure that only high-quality and effective products reach farmers, maintaining standards for agricultural inputs.

Recent Regulatory Notification

- The Ministry of Agriculture and Farmers Welfare has issued a gazette notification, officially registering 34 new biostimulants under the FCO. This action brings the total number of registered biostimulants in India to over 45.

Major Categories of Registered Biostimulants

- Seaweed extracts and botanical extracts
- Humic and fulvic acid formulations and derivatives
- Protein hydrolysates and amino acid blends
- Bio-chemicals and vitamin complexes
- Cell-free microbial products and enzymatic biostimulants
- Antioxidants and anti-transpirants

6.2 SNIPPETS

Topics	Details
Candida Tropicalis	• A study published in PLoS Biology reveals that the fungicide tebuconazole, commonly used in farming, is driving the evolution of resistance in Candida tropicalis. • Candida tropicalis is a **versatile fungal pathogen** found in **soil, marine water, fruits and the human gut**. It primarily infects **immunocompromised individuals**, including: ○ **Cancer patients** (due to chemotherapy-induced neutropenia) ○ **Diabetics** (uncontrolled blood sugar weakens immunity) ○ **Antibiotic users** (disrupted gut microbiota). • Systemic infections (e.g., bloodstream candidiasis) have a **55–60% mortality rate**, making it a **WHO high-priority pathogen.** • In **China**, fluconazole resistance in *C. tropicalis* surged from **5.7% (2009) to 31.8% (2018)**. Resistant strains detected in **Brazil, Taiwan and India** highlight cross-border risks.
Nakshatra	• The Indian Council of Medical Research (ICMR) has established a high-performance computing (HPC) facility, 'NAKSHATRA', at its National Institute of

	Virology (NIV) in Pune. • The facility, **developed under the Pradhan Mantri Ayushman Bharat Health Infrastructure Mission (PM-ABHIM),** aims to enhance genomic surveillance and data analysis capacity. • The facility **supports a wide range of bioinformatics applications,** including Next-Generation Sequencing (NGS), transcriptomics, phylogenetics, metagenomics and structural bioinformatics. • The high-speed computing power **enables scientists to detect new disease threats sooner,** allowing for more efficient and timely responses to potential outbreaks.
Gwada Negative	• Scientists have identified a new blood type called "Gwada negative", which is now the rarest blood type ever recorded. As of June 2025, only one person is known to possess it. • "Gwada negative" is the informal name for the newly classified EMM-negative blood group system. • The International Society of Blood Transfusion (ISBT) has officially registered it as ISBT042, making it the 48th globally recognized blood group system. • This blood group is defined by "the **absence of the EMM antigen." The EMM antigen normally resides on red blood cells and is considered a high-incidence antigen**, meaning it is present in nearly all humans. • The rarity first came to light in 2011 during routine blood tests for a 54-year-old woman from Guadeloupe who was living in Paris. Researchers then used high-throughput DNA sequencing to uncover the specific genetic mutation responsible for this rarity.
Quantum Communication	• Indian scientists have demonstrated secure quantum entanglement-based free-space secure communication over a distance of over one kilometre via an optical link. • Quantum communication is the **science of transmitting information encoded in quantum states of particles, commonly photons**. • Quantum Entanglement is a phenomenon where two or more quantum particles become linked in such a way that their properties are correlated, regardless of the distance separating them. • Quantum Key Distribution (QKD) is used to securely generate and share a secret random key between two parties, which is then used to encrypt and decrypt the actual message sent over a conventional network. • Quantum communication provides a foolproof method for securing communications for armed forces, intelligence agencies and the government, making them immune to snooping.
Valley Fever	• A study by UC Davis has found that dogs can detect Valley fever, a fungus infection, before humans. • Valley fever, **also known as coccidioidomycosis, is caused by inhaling the spores of the fungus Coccidioides,** which are found in soil in arid and semi-arid regions, particularly in the south western United States and parts of Latin America. • The disease is not contagious but occurs from environmental exposure. • Symptoms include fever, cough and fatigue, which usually resolve on their own. However, in a small fraction of cases, particularly among the elderly or those with weakened immune systems, the infection can spread from the lungs to

	other parts of the body, such as the skin, bones, or brain.

Black Box	• Role of the black box in uncovering the cause behind the tragic Air India AI171 plane crash in Ahmedabad.
	• The "black box" is a term used to describe **two durable recording devices mandated on commercial aircraft by international regulations.**
	  ○ The first is the Flight Data Recorder (FDR), which records flight parameters, such as airspeed, altitude, heading, engine performance and the position of flight controls.
	  ○ The second is the cockpit Voice Recorder (CVR), which records the audio environment of the cockpit, including conversations between pilots, radio communications with air traffic control and ambient sounds.
	• These recorders are housed in a Crash Survivable Memory Unit (CSMU) made of stainless steel or titanium and are designed to withstand extreme conditions, including immense impact forces, high temperatures and deep-sea pressure.
	• They are located in the tail section of the aircraft, which has a higher chance of surviving a crash.

Cathepsin B	• The National Institute of Animal Biotechnology (NIAB) has discovered a mechanism that could slow female reproductive ageing by targeting the ovarian reserve and a specific cellular protein. • The ovarian reserve, a pool of eggs in female mammals, cannot be naturally regenerated and declines due to factors like oxidative stress and cellular ageing. • The research team identified a protein-degrading **enzyme called Cathepsin B (Cat B) as a key driver of this decline. By reducing Cat B's activity, scientists were able to slow down egg cell loss, protecting the ovarian reserve from premature decline.** • This discovery could address delayed parenthood and also provide an alternative to expensive, invasive and less effective In-Vitro Fertilization (IVF) solutions. • Applying this finding to livestock could extend reproductive years, directly improving herd productivity and enhancing farmers' financial stability.
Tourette Syndrome	• A 12-year-old child from Kochi diagnosed with Tourette Syndrome (TS), a complex neurological disorder. • Tourette Syndrome is a **neurodevelopmental disorder characterised by sudden, repetitive and involuntary movements** or vocal sounds. • It appears between the ages of 2 and 15, with an average onset around six years old. • It affects an estimated 0.3% to 1% of the global population, with boys being more commonly affected than girls. • Symptoms are classified into simple and complex tics, which can worsen with stress, excitement, or fatigue and improve when calm or focused. • The exact cause of Tourette Syndrome is still unknown, but research suggests a combination of genetic factors, neurobiological factors and environmental factors. • There is **no cure for Tourette Syndrome**, but various treatments can help manage the symptoms.
Sparc THERAPY	• A team of U.S. experts has successfully used step-and-shoot spot-scanning proton arc therapy (SPArc) for the first time on a patient to destroy cancerous cells.

	• SPArc is an **advanced form of proton therapy that uses protons instead of photons to deliver radiation to tumours.** • SPArc operates by scanning proton beams across a tumour in energy layers, with each layer corresponding to a specific depth of tissue penetration. • It offers benefits such as precise targeting, lower radiation doses, real-time adjustments for anatomical changes and automated delivery, enhancing patient comfort and clinic throughput.
Statins	• A recent study, published in Frontiers in Immunology, shows that statins may reduce death rates in sepsis patients. • Statins are a **class of drugs that inhibit HMG-CoA reductase, an enzyme crucial for cholesterol production in the liver**. These drugs can modulate the immune system's response, making them a key subject for study in treating inflammatory conditions like sepsis. • **Sepsis is a life-threatening medical emergency where the body's response to an infection becomes dysregulated,** which leads to widespread inflammation. This heightened immune response can severely damage multiple organs, potentially resulting in organ failure and death. • **Causes :**An infection triggers sepsis, which can be bacterial, viral, fungal, or parasitic. Common sources of infection that lead to sepsis include pneumonia and infections in the urinary tract, skin and gut. • According to the World Health Organization (WHO), sepsis affects around 49 million people worldwide each year and causes about 11 million deaths, accounting for 20% of all deaths globally.
Salmonella	• A recent Salmonella outbreak in the United States has been linked to contaminated eggs from a California-based company. • Salmonella is a **group of bacteria that cause foodborne illness known as salmonellosis,** which is primarily transmitted through contaminated food or water. • Common carriers include raw or undercooked meat, eggs, unpasteurised milk and dairy products and unwashed fruits and vegetables. • Salmonella is contagious and can be transmitted from person to person through the faecal-oral route, as well as contact with infected pets, especially reptiles and birds.
Cryo-Electron Microscopy (Cem)	• Researchers in the U.S. have developed "Magnetic Isolation and Concentration cryo-electron microscopy" (MagIC). • Cryo-electron microscopy (Cryo-EM) is an **imaging technique that enables scientists to view the three-dimensional (3D) shapes of biological molecules like proteins and viruses at near-atomic resolution.** • It works by freezing samples to temperatures below -150°C, trapping them in a thin layer of non-crystalline ice. • A powerful electron microscope captures thousands of 2D images of the frozen molecules from different angles, which are processed by advanced computer algorithms to reconstruct a detailed 3D model. • Cryo-EM has transformed structural biology by enabling researchers to understand the function of complex molecular machinery, crucial for virology, cell biology and drug discovery.
Katrin Experiment	• The Karlsruhe Tritium Neutrino (KATRIN) experiment has established a new

	upper limit on the mass of the neutrino. • The Karlsruhe Tritium Neutrino **(KATRIN) experiment in Germany has established a new upper limit on the mass of the neutrino**, a fundamental subatomic particle with a small mass. • Neutrinos are among the most abundant particles in the universe, originating from nuclear reactions within stars and supernova explosions. Their negligible electric charge and mass make them difficult to detect, necessitating large, sensitive and often underground detectors.
India's First Gene-Edited Sheep	• Scientists at the Sher-e-Kashmir University of Agricultural Sciences and Technology of Kashmir (SKUAST-K) in Srinagar have successfully produced gene-edited sheep. • Scientists at the Sher-e-Kashmir University of Agricultural Sciences and Technology of Kashmir (SKUAST-K) in Srinagar have produced **India's first gene-edited sheep using the CRISPR-Cas9 method**. This technology is more precise, faster and cheaper than traditional genetic modification methods, allowing for targeted changes without introducing foreign DNA. • **The 'Kashmir Merino' Project targets the local breed known for its fine wool and adaptation to high-altitude climates.**The 'myostatin' gene, a natural regulator of muscle growth in sheep, was edited to remove the brakes on muscle development. The gene-edited lamb shows a potential increase in muscle mass by nearly 30%, while its wool yield remains the same.
Axiom 4	• The Axiom Mission 4 (Ax-4) carrying Indian Air Force Group Captain Shubhanshu Shukla to the International Space Station (ISS) has been launched. • Axiom-4 Mission is a **private spaceflight operated by Axiom Space, to send a multinational crew to the International Space Station (ISS)** for a mission focused on scientific research, outreach and commercial activities. • It is a 14-day mission, to focus on scientific experiments, technology demonstrations and educational outreach aboard the ISS.
Diphtheria	• Western Europe is facing its most serious diphtheria outbreak in 70 years. • Diphtheria is a severe, **highly contagious bacterial infection caused by toxin-producing strains of Corynebacterium diphtheriae.** • The bacterium attacks the respiratory system, releasing a powerful toxin that enters the bloodstream and spreads throughout the body, damaging vital organs, causing myocarditis, nerve damage and kidney failure. • Transmission occurs through respiratory droplets and direct contact with infected skin lesions. • The **DTaP vaccine, covering Diphtheria, Tetanus and Pertussis, is highly effective** and a core component of routine national immunization programs.

6.3 ADDITIONAL TOPICS FOR READING FROM IASGYAN WEBSITE

Topic Name	Date
BUILDING-INTEGRATED PHOTOVOLTAICS (BIPV)	4th June, 2025
BATTERY RECYCLING TECHNOLOGY	28th June, 2025

7. CULTURE AND HISTORY

7.1 SHORT ARTICLES

Neolithic Age

Context

- The Archaeological Survey of India recently found one of the earliest Neolithic rock grooves in Kanniyakumari, likely used for sharpening weapons.

About the Neolithic Age

- Also known as the New Stone Age, the Neolithic Age marked the final stage of cultural and technological evolution in prehistoric times. It saw the rise of settled communities, agriculture and animal domestication.
- Beginning around 10,000 BCE during the Holocene Epoch, it followed the Paleolithic Period and came before the Bronze Age. It began in the Fertile Crescent and spread to India, Europe and beyond.

Features of Neolithic Age

- Warmer climates led to grasslands. People domesticated animals like sheep, goats and cattle and began fishing.
- Farming of wheat, barley and rice began, leading to permanent settlements. People crafted pots, baskets and dug storage trenches.

Important Sites of the Neolithic Age

- Mehrgarh (Pakistan)
- Burzahom (J&K)
- Chirand (Bihar)
- Koldihwa&Mahagara (U.P.)
- Hallur (Karnataka)
- Paiyampalli (Tamil Nadu)

Raigad Fort

- **Context**

  The Archaeological Survey of India and Raigad Development Authority recently excavated Raigad Fort and discovered a rare 'yantraraj' (astrolabe).

About Raigad Fort

- Raigad Fort served as the capital of the Maratha Empire under Chhatrapati Shivaji Maharaj and symbolizes Maratha strength and independence.

Location

- It is a hill fort in Maharashtra's Raigad district, nestled in the Sahyadri (Western Ghats) range.

Geographical and Historical Significance

- Perched on an isolated hill, it is surrounded by the Kal and Gandhari river valleys. The fort is accessible through a steep path and stone steps.
- Nearby lies the artificial Ganga Sagar Lake. The Hirkani Buruj is one of its notable towers. Known as the "Gibraltar of the East," Shivaji Maharaj captured the fort in 1656 and declared it the Maratha capital in 1674.
- Its design includes multiple fortifications and gateways. In 1765, it faced an attack by the British East India Company.

Raja Bhabhut Singh

Context

- The Madhya Pradesh government has renamed the Pachmarhi Wildlife Sanctuary in honour of 19th-century tribal hero Raja Bhabhut Singh.

Who is Raja Bhabhut Singh?

- Raja Bhabhut Singh belonged to the Jagirdar dynasty of HarrakotRaikheri and was a descendant of Thakur Ajit Singh. His grandfather, Thakur Mohan Singh, fought alongside Peshwa Appa Saheb Bhonsle against the British in 1819–20. As a key Gond monarch ruling over Jabalpur and the Satpura hills, Bhabhut Singh led guerrilla attacks against the British during the 1857 revolt, using his deep knowledge of local terrains.

Other Notable Tribal Icons in Madhya Pradesh

- **Tantya Bhil:** Bhil freedom fighter; Patalpani station renamed after him.

- **Bhima Nayak**: Bhil leader of the Khandesh resistance.
- **Rani Kamlapati**: Gond queen; Habibganj station renamed in her honour.
- **Shankar Shah & Raghunath Shah**: Gond royals known for their 1857 revolt resistance; Chhindwara University was renamed after them.

Keeladi Findings

Context

- Union Culture Minister Gajendra Singh Shekhawat said archaeologist Amarnath Ramakrishna's Keeladi excavation report lacks technical and scientific support.

What is Keeladi Village?

- Keeladi is a small village in Sivaganga district, Tamil Nadu, about 12 km southeast of Madurai along the Vaigai River.
- Excavations in 2015 revealed evidence of an urban civilization during the Sangam age.

Historical Significance

- Excavation began in 2015 by ASI and was later taken over by the Tamil Nadu State Archaeology Department.
- Over 18,000 artefacts unearthed, including pottery, inscribed potsherds, gold, copper, beads, bangles, seals and weaving tools.
- More than 120 potsherds with Tamil Brahmi script indicate early literacy and use of script.
- A planned urban settlement with industries such as pottery, weaving, dyeing and bead-making is evident. Discovery of beads suggests active trade; dice and hopscotch pieces reflect recreational activities.

PRASAD Scheme

Context

- After prolonged discussions, Chamundi Hills in Karnataka will now be developed under the central government's PRASHAD scheme, aimed at enhancing pilgrimage destinations.

What is the PRASHAD Scheme?

- Launched in 2014–15 by the Ministry of Tourism, the scheme originally named PRASAD was renamed PRASHAD in 2017.
- It focuses on the holistic development of pilgrimage and heritage sites. After the HRIDAY project ended, PRASHAD absorbed its heritage development goals.
- PRASHAD supports the integrated development of prominent religious sites such as Amaravati and Srisailam (Andhra Pradesh), Kamakhya (Assam), Parasuram Kund (Arunachal Pradesh) and Patna and Gaya (Bihar).
- Projects are implemented by respective State/UT governments through designated agencies.

Funding Mechanism

- The central government funds 100% of project components. Additionally, the scheme encourages the use of Corporate Social Responsibility (CSR) and Public-Private Partnerships (PPP) to boost project sustainability.

Ghumot

Context

- In 2019, the Goa Cabinet declared the Ghumot as the state's heritage instrument. Now made without monitor lizard skin, it has sparked discussions on folk music authenticity.

What is Ghumot?

- Ghumot (or Ghumat) is a traditional Goan percussion instrument used in religious and cultural celebrations.

Features of Ghumot:

- **Construction:** Handmade clay pot with skin membrane; now uses goat or synthetic skin.
- **Sound Quality:** Produces sharp, earthy beats; key to Goan folk music.
- **Playing Technique:** Requires rhythmic tapping and skill.
- **Legal Shift:** Monitor lizard skin banned since 2019; eco-friendly alternatives adopted.
- **Musical Classification:** Not part of Hindustani or Carnatic traditions.

Importance of Ghumot in Music and Culture:

- **Cultural Symbol:** Central to Goan festivals like Sao Joao, Ganesh Chaturthi, Shigmo and Catholic weddings.

- **Secular Significance:** Played by diverse communities, reflecting inclusivity.
- **Revival Initiatives:** Modern designs and legal materials used to promote Ghumot globally.
- **Socio-economic Role:** Helps preserve heritage and support local artisans.

Sree Narayan Guru

Context

- The Prime Minister recently marked the 100th anniversary of Mahatma Gandhi's 1925 meeting with Sree Narayana Guru at Vigyan Bhawan, New Delhi.

Who is Sree Narayana Guru?

- Sree Narayana Guru (1856–1928) was a revered saint, philosopher and social reformer from Kerala. Born into the Ezhava community, he challenged the rigid caste system and fought for spiritual and social equality.
- Trained in yoga and meditation by AyyavuSwamikal, he spent eight years as a hermit. Known as "Gurudevan," he led a peaceful revolution that reshaped Kerala's social structure through nonviolence, Vedic wisdom and inclusiveness.

Important Works Against Caste Injustice:

- Coined the slogan "One Caste, One Religion, One God for All"
- Built the Aruvippuram Shiva temple (1888) defying caste norms
- Installed mirrors in temples to reflect divinity within individuals

8. GEOGRAPHY AND DISASTER MANAGEMENT

8.1 SHORT ARTICLES

Birch Glacier

- **Context**

  A large section of Birch Glacier in Switzerland collapsed recently, destroying a town in the Alpine region.

About Birch Glacier

- Located in the Lötschental Valley, Swiss Alps
- Swiss glaciers have lost 40% of their volume since 2000
- Record heat in 2022–23 caused 10% of the loss

Reason for Collapse

- Triggered by a combination of:
  - Heavy debris load
  - Thawing permafrost
  - Rising temperatures
- Permafrost has warmed by 1°C in 10–15 years, loosening rocks and increasing landslides
- The collapse impacted the River Lonza, increasing flood risk

About the Swiss Alps

- Located south of the Swiss Plateau
- Serve as a natural barrier between northern and southern Europe
- Historic trade routes pass through key mountain passes

About the Alps

- Europe's largest and highest fold mountain range
- Spread across 8 countries
- Mont Blanc (France–Italy border) is the highest peak

Taiwan

Context

- Taiwanese President Lai Ching-te faces legislative hurdles as the opposition KMT holds 52 of 113 seats, blocking his party's majority.

About Taiwan

- Located north of the Philippines in the South China Sea.
- Lies about 180 km off China's southeast coast, separated by the Taiwan Strait.

Geopolitical Significance

- **Taiwan Relations Act (1979):** Strengthens US-Taiwan ties via trade, culture and defense support.
- **Strategic Location:** Taiwan Strait is a vital global shipping lane.
- **Tech Hub:** Produces over 60% of global semiconductors and 90% of advanced chips.

China–Taiwan Relations

- **China:** Follows One China Policy, views Taiwan as part of its territory.
- **Taiwan:** Functions as a self-governing democracy with its own government.

India's Position

- In 2003, India acknowledged China's claim over Tibet but hasn't reaffirmed the One China Policy since.

Aravalli Range

Context

- The Aravalli Green Wall initiative aims to restore degraded land along a 700-km stretch from Gujarat to Delhi by establishing green cover across the Aravalli Range.

About the Aravalli Range

- Extends ~670 km from Delhi to Ahmedabad
- Passes through Haryana and Rajasthan
- Highest peak: Guru Shikhar (Mount Abu) at 1,722 meters
- Among the world's oldest mountain ranges, dating to the Proterozoic age

Formation of Aravallis

- Formed during the Proterozoic Eon due to tectonic activity
- Made up of metamorphic rocks: schist, granite, gneiss
- Shaped over time by erosion

Kerch Bridge

Context

- Ukraine has claimed responsibility for a major underwater explosion targeting the Kerch Bridge — a vital link between mainland Russia and annexed Crimea.

About the Kerch Bridge

- Spanning 19 km across the Kerch Strait, the bridge includes parallel rail and highway routes. Opened in 2018 by President Vladimir Putin, it symbolizes Russia's control over Crimea, annexed in 2014 after a disputed referendum.

Location

- The bridge crosses the Kerch Strait — the only waterway connecting the Black Sea and the Sea of Azov. It separates the Kerch Peninsula (west) from Russia's Taman Peninsula (east).

Significance of the Kerch Bridge for Russia

- **Connectivity**: Links mainland Russia to Crimea post-2014 annexation
- **Logistical Link**: Key route for supplying Russian troops in southern Ukraine
- **Strategic Vulnerability**: A frequent Ukrainian target, its damage impacts Russian military logistics and morale

Inga Dam

Context

- The World Bank has approved $250 million for the Inga 3 hydroelectric project in the Democratic Republic of the Congo (DRC), despite civil society concerns and governance issues.

What is the Inga Dam?

- The Inga Dam is a series of hydroelectric projects on the Congo River. Inga 1 (1972) and Inga 2 (1982) are operational. Inga 3 and Grand Inga are proposed expansions.

Location

- It is situated about 225 km southwest of Kinshasa, near the Congo River's entry into the Atlantic Ocean.

Nations and Institutions Involved

- **Lead Nation**: DRC
- **Key Financers**: World Bank (up to $1 billion), African Development Bank, European Investment Bank, others

Key Features of Inga Dam

- Exploits Congo River's immense flow and 97-meter drop at Inga Falls
- Potential capacity: 40,000 MW (twice that of China's Three Gorges Dam)
- Inga 3 alone will cost $14 billion and generate 4,800 MW.

Ocean Darkening

Context

- A new study reveals that over one-fifth of the world's oceans have significantly darkened in the past two decades.

What is Ocean Darkening?

- Ocean darkening refers to the shrinking of photic zones—sunlight-penetrated layers up to 200 meters deep that support photosynthesis. These zones are crucial for marine life, climate regulation and fisheries.

Why is the Ocean Darkening?

- **Coastal Zones**: Runoff from agriculture, organic matter and sediments lead to algae blooms that block light.
- **Open Ocean**: Likely driven by changes in plankton, rising sea temperatures and altered ocean currents.

Research Findings

- Using satellite data and modeling (via Kd 490), researchers found that between 2003 and 2022, 21% of ocean areas darkened, with 9% seeing photic zones shrink by over 50 meters.

Impact on Marine Life

- Reduced sunlight disrupts feeding and reproduction for light-dependent species, threatening food chains and marine biodiversity.

Sharda River

Context

- Four teens died after being swept away while bathing in the Sharda River recently.

About Sharda River

- The Sharda River is the downstream name of the Kali (or Mahakali) River, originating in the

Pithoragarh district of Uttarakhand on the eastern slopes of the Nanda Devi massif at 3,600 m.

Course of the Sharda River

- It begins as the Kali River in northern Uttarakhand and flows south-southwest, forming the border between Nepal and India.
- After reaching Barmdeo Mandi (Nepal), it enters the Indo-Gangetic Plain and is called the Sharda River. Flowing through Uttar Pradesh, it joins the Ghaghara River southwest of Bahraich, covering around 480 km.

Tributaries of Sharda River

- Dhauliganga
- Goriganga
- Sarju

Dams on the Sharda River

- The Pancheshwar Dam, a proposed 5,600 MW Indo-Nepal hydro project for power and irrigation, has faced delays due to political challenges. Talks resumed in 2013 due to its strategic importance.

Jal Ganga Samvardhan Abhiyan

Context

- Madhya Pradesh's *Jal Ganga Samvardhan Abhiyan*, aimed at conserving and rejuvenating water bodies, is showing encouraging results across the state.

What is the Jal Ganga Samvardhan Abhiyan?

- Launched on March 30, 2025, along the Kshipra River, the campaign runs till June 30, 2025.
- It gained momentum after Prime Minister Modi highlighted it, citing the revival of the Ghoda Pachhad River (a Narmada tributary) in Khandwa district, with strong local participation.

Objectives of the Jal Ganga Samvardhan Abhiyan

- Restore rivers, ponds, wells and stepwells
- Clean polluted drains under *Swachh Bharat Mission 2.0*
- Encourage public engagement, especially women's participation, through urban local bodies

Shongtong Karcham Hydroelectric Project

Context

- The Himachal Pradesh Chief Minister has announced November 2026 as the target for completing the long-delayed Shongtong-Karcham Hydropower Project.

About ShongtongKarcham Hydroelectric Project

- This 450 MW run-of-river project is located on the Satluj River in Kinnaur, Himachal Pradesh. It has three units of 150 MW each and is expected to generate 1,594 million units annually.
- The project uses Francis turbines, with a gross head of 128.57 meters and net head of 126.58 meters. It includes three penstocks (5.1 m each) and is developed by Himachal Pradesh Power Corporation Limited (HPPCL).

About Satluj River

- Also known as Satadree, it is an antecedent river (maintains original course despite topographic changes) and a tributary of the Indus River.
- Among Punjab's five rivers, it's the longest and easternmost. Originating near Lake Rakshastal in Tibet (LangqênZangbo), it flows ~260 km before entering India via the Shipki La Pass.

Nuvvuagittuq Greenstone Belt

Context

- Scientists recently used two radioactive dating methods to estimate that rocks from the Nuvvuagittuq Greenstone Belt are around 4.16 billion years old.

About Nuvvuagittuq Greenstone Belt

- Located on Hudson Bay's eastern shore in Quebec, Canada, this belt holds some of Earth's oldest rocks.
- Its unique geology makes it vital for studying Earth's early history.
- These rocks rival the Acasta Gneiss Complex (~4 billion years old) in age.

Historical and Geographical Significance

- Originally mapped in 1965, the region remained understudied until the 2000s.

- U-Pb zircon dating revealed zircons as old as 3,750 Ma.
- Debate continues over the belt's exact age and history.
- It lies within the Ujaraaluk Mafic Unit in the Inukjuak subprovince of the Minto Block (NESP).
- In 2025, local Inuit communities revoked sampling permits due to environmental concerns.

What are ultramafic rocks?

- Ultramafic rocks are dark igneous or meta-igneous rocks rich in MgO and FeO but low in silica and potassium.
- They contain over 90% mafic minerals.
- Common in mountain belts, they offer insight into the Earth's mantle and deep-Earth processes.