

FORTUNE Prelims Precise

May 2025



FORTUNE IAS

Toppers in Top 100



P K Sidharth Ramkumar
2024



Meera K
2021



Sidharth B
2017



Dilip K Kainikkara
2022



Hamna Mariyam
2017



Sreelakshmi Ram
2019



Vishnu Sasikumar
2024



Anand
2016



Arya V M
2023



Archana P P
2024



Safna Nazarudeen
2020



Nandanaa G P
2025



Renjina Mary V
2019



Sonnet Jose
2025



Dr. Arun S Nair
2020



Alfred O V
2022



Hari Kallikkat
2018



Benjo P Jose
2024



Aparna M B
2021



Dheenah Dastageer
2021



Akhil V Menon
2022



Arjun Mohan
2019



Kasturi Sha
2024



Fabi Rasheed
2024



Reenu Anna Mathew
2025



Malini S
2023



Devi Nandana
2020



Annie George
2024



Devika Priyadersini
2025



Kiran P B
2022

Preface

Fortune IAS Academy presents '**Prelims Precise**', a monthly current affairs magazine through which we make prelims current affairs revision precise and effective.

This magazine is a comprehensive resource that condenses the significant news of each month into distinct sections such as polity and governance, economic development, science & technology, among others.

Each content is organised with the why in news context followed by its explanation.

Fortune Prelims Precise is available to all Prelims cum Mains batch students (2024) as part of the course study material. **It can be purchased from Fortune IAS Academy for Rs. 75 per issue.**

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Caste Census

- **The Cabinet Committee on Political Affairs (CCPA)** chaired by the Prime Minister has decided to include **caste enumeration in the upcoming census**.
- As per **Article 246 of the Constitution**, Census is a **union subject listed at 69** in the Union List in the Seventh Schedule.
- The Census was conducted by the central government under the **Census Act, 1948** and the last one was held in 2011.
- Every Census in independent India from 1951 to 2011 has published data on **Scheduled Castes and Scheduled Tribes, but not on other castes**.
 - 📌 During the **British period, starting from the 1881 census**, comprehensive caste data was collected for administrative purposes.
- In 2011, a separate **Socio-Economic Caste census** was conducted, but the details were not released fully citing data quality issues.
- In the absence of such a Census, there is no proper estimate for the population of Other Backward Classes (OBCs), various groups within the OBCs, and others.
 - 📌 **The Mandal Commission** estimated the OBC population at 52% largely based on the 1931 census data.

Caste Census in India



What it means

- 1 Caste will be enumerated for the first time in a census since Independence. **1931** The last time a caste census was conducted in India
- 2 It will likely lead to an expansion of caste-based quotas in jobs and education, especially for other backward classes
- 3 Caste-based quotas will likely breach the 50% cap set by the 1992 Indra Sawhney judgment
- 4 The data might be used to create sub-quotas in SC, ST and OBC reservations. The Supreme Court has already permitted the government to sub-divide SC, ST quotas, and the Rohini Commission's recommendations on sub-categorisation of OBCs is pending with the administration

Digital Access as a Fundamental Right

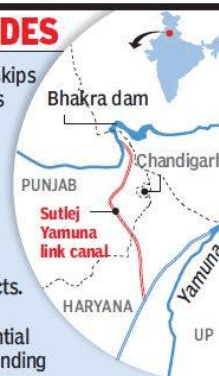
- The Supreme Court (SC) held in a judgment that **inclusive and meaningful digital access to e-governance and welfare delivery systems** is a part of the fundamental right to life and liberty (Article 21).
- The judgment was based on a petition filed by a group of **acid attack survivors**, who raised concerns about how **disabled persons, including acid attack victims**, find it nearly impossible to successfully complete the KYC processes, which include visual tasks.
- The SC directed revisions to **Know-Your-Customer (KYC) digital norms** invoking the **'principle of substantive equality'**, which not only encompasses **dignity, or equality of opportunity** but also aims for a four dimensional principle;
- To redress disadvantage;
 - ★ To address stigma, stereotyping, prejudice and violence;
 - ★ To enhance voice and participation; and
 - ★ To accommodate differences and achieve structural change.

Punjab-Haryana Water Dispute

DRAGGING ON FOR DECADES

- ▶ **1966** | Reorganisation of Punjab; it is decided that Haryana will get share of Sutlej water
- ▶ **1977** | Land acquisition starts for 214km Sutlej Yamuna link – 122km of it in Punjab and 92km in Haryana
- ▶ **1980** | Haryana completes its

- portion. Punjab skips deadlines, moves SC repeatedly
- ▶ **2004** | SC orders Punjab to complete canal. State govt passes Act terminating water-sharing pacts. Matter referred to SC for presidential reference. Still pending



- The Supreme Court has come down heavily on Punjab state for its failure to follow its directions to complete the **Sutlej Yamuna link canal** to share waters with Haryana.
- Waters of **Sutlej, Ravi and Beas** are allocated to India under the Indus Waters Treaty.
- However, once the states of Punjab and Haryana were created the water sharing became a problem with a **water deficient Haryana** seeking more water for its irrigation.

- Based on a 1976 central government decision to allocate waters from Sutlej to Haryana from Punjab via a **Sutlej-Yamuna Link (SYL) Canal**.
- This would carry waters of Ravi and Beas via Sutlej to Yamuna, helping Haryana.
- In 1981 the states of Punjab, Haryana and Rajasthan signed an agreement to implement this but the increasing need for water for irrigating the growing agricultural lands of Punjab forced Punjab to delay and even pass a law in **Punjab Termination of Agreements Act, 2004** to rescind the 1981 water-sharing agreement.
- However, SC in 2002 and even after a **presidential reference in 2016** had maintained that **Punjab has to follow through with the agreement** and construct its share of the SYL canal.
- SC has now told Punjab that if there is no resolution to the dispute then it will be taken up again in August this year.

score alongside persistent polarisation and repression.

INDEX 2025

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Score : 32.96

INDEX 2024

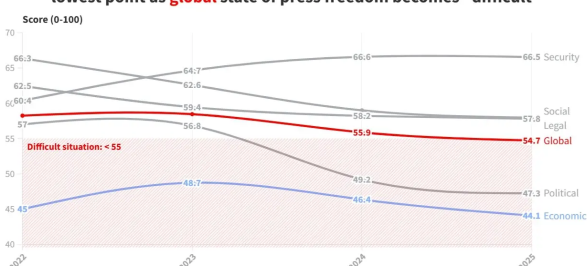
159 / 180

Score : 31.28

POLITICAL INDICATOR	155 24.30	POLITICAL INDICATOR	159 21.58
ECONOMIC INDICATOR	132 34.17	ECONOMIC INDICATOR	157 31.67
LEGISLATIVE INDICATOR	141 42.64	LEGISLATIVE INDICATOR	143 40.87
SOCIAL INDICATOR	160 32.38	SOCIAL INDICATOR	156 33.33
SECURITY INDICATOR	155 31.30	SECURITY INDICATOR	162 28.97

World Press Freedom Index

In 2025, the **economic** indicator of the RSF World Press Freedom Index hit its lowest point as **global** state of press freedom becomes "difficult"



Source: World Press Freedom Index. Link to share
©Reporters Without Borders - Blanche Marès & Côme Nottaris **RF**

- India ranked **151st with a total score of 32.96** in the recent World Press Freedom Index 2025, moving up 8 places from 159th last year.
- The Reporters Without Borders (RSF)**, an international **non-profit and non-governmental** organization headquartered in Paris, releases the **annual World Press Freedom Index 2025**.
- Witnessing a troubling downward trend, the global landscape is being described as a **"difficult situation"** for the first time in history, according to new findings of the Index.
- Norway led the list in 2025**, as it did last year, followed by **Estonia and then Netherlands**.
- Eritrea is at the bottom-most** this year, followed by countries in Sub-Saharan Africa and East Asia, which experience a **worrying deterioration of 80% of the economic**

SC Ruling on Maternity Benefits in India

Making It Easy For Mothers

The Maternity Benefit (Amendment) Act, 2017 amends the Maternity Benefit Act, 1961 to provide the following

26 weeks maternity leave for the first two children

12 weeks maternity leave for children beyond the first two

12 weeks leave for mothers adopting a child below the age of three months



The Act makes it mandatory for employers in establishment with 30 women or 50 employees, whichever is less, to provide creche facilities either in office or in any place within 500-meters.

Working mothers will be permitted to make four visits

during working hours to the creche

The employer may permit a woman to work from home if it is possible to do so

Every establishment will have to make these benefits available from the time of appointment

- The Supreme Court passed a significant ruling recently allowing **'maternity benefit'** to a Tamil Nadu-based teacher for **her third child**.
- The Supreme Court noted that the **Maternity Benefit (Amendment) Act, 2017**, does not bar maternity leave for women with more than two children, and **only limits the duration of leave** — 26 weeks for those with up to two children, and **12 weeks for those with more**.
- The SC said that **Article 21 of the Constitution guarantees the right to health**, and that maternity benefits and reproductive rights are an integral part of this.

Quality Council of India (QCI)

- The new unified headquarters of the Quality Council of India (QCI) was recently inaugurated **at the World Trade Centre in New Delhi**.
- Quality Council of India (QCI) was established as a **National body for Accreditation** on recommendations of Expert Mission of EU through a Cabinet decision in 1996.
- QCI is a **non-profit organization** registered under the **Societies Registration Act XXI of 1860**.
- The **Department of Industrial Policy and Promotion**, Ministry of Commerce and Industry is nodal Ministry.
- QCI has been established to create a mechanism for **independent third party assessment** of products, services and processes.
- QCI was set up through a **PPP model** as an independent autonomous organization with the support of **Government of India and the Indian Industry** represented by the three premier industry associations:
 1. Associated Chambers of Commerce and Industry of India (ASSOCHAM),
 2. Confederation of Indian Industry (CII) and
 3. Federation of Indian Chambers of Commerce and Industry (FICCI).

Retrospective Environmental Clearances

- The Supreme Court recently struck down a 2017 notification of the Ministry of Environment, Forest and Climate Change (MoEF&CC), which introduced **a regime of granting ex-post facto clearances to projects**.
- **Ex-post facto or retrospective green clearances** allow industries to start projects without prior environmental clearance and seek approval later.
- These clearances violate the mandatory pre-approval system under the Environment Impact Assessment (EIA) Notification, 2006, issued under the Environment (Protection) Act, 1986.
- **ECs already granted** under the quashed notifications would remain unaffected.

Official Secrets Act, 1923

- A travel blogger from Haryana, has been charged under **Sections 3 and 5 of the Official Secrets Act** for allegedly passing sensitive information to Pakistani intelligence operatives during **'Operation Sindoor'**.
- **The Official Secrets Act of 1923** is a colonial-era legislation enacted in India to counter espionage and **safeguard sensitive information** related to national security.
- The Act criminalises **spying, unauthorised sharing** of confidential government information, and the **withholding of sensitive data** that could potentially threaten the safety or interests of the state.
- It applies to **all Indian citizens**, including government servants, both within and outside the country.
- **Section 3:** It targets **acts of espionage or activities prejudicial to the safety** or interests of the state.
 - It **criminalises actions such as approaching, inspecting, or entering** prohibited places (like, military bases, arsenals) for purposes harmful to the state.
 - It also includes **making sketches, plans, models, or notes** that could, directly or indirectly, be useful to an enemy.
- **Section 5:** deals with the **"wrongful communication"** or handling of official secrets by individuals who possess or **control such information due to their official position** or relationship with the government.

Economy

Replacement Level Fertility

- A new study suggests that the conventional **replacement level fertility (RLF) of 2.1 children per woman** may be insufficient in developed countries to prevent long-term population decline and potential extinction.
- It recommends a **higher RLF of 2.7** for these regions.
- RLF refers to the **average number of children a woman needs to have** in order to exactly replace herself and her partner in the population—**without increasing or decreasing the overall population**, assuming no immigration or emigration.
- In **developed countries**, RLF is usually **2.1 children per woman**.
 - The extra 0.1 accounts for child mortality and women who don't reproduce.
- RLF maintains population size across generations only if mortality and migration remain stable.
- The study notes that **global population growth peaked in the 1960s** and is projected to reach 8.5 billion by 2030.
- However, due to **large population sizes and a female-biased birth ratio** (due to higher male mortality), extinction risk remains low for now.

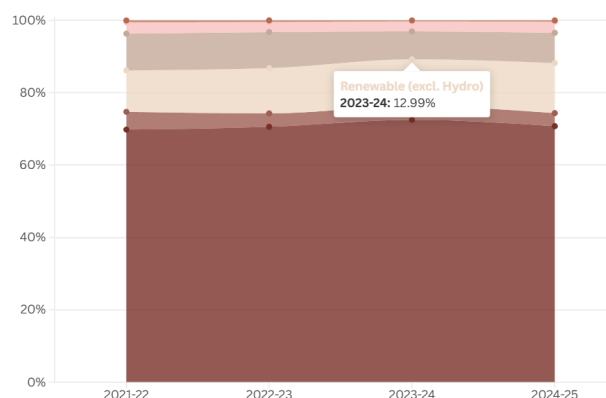
India's Transition to Power Sufficiency by 2025

- India has transformed **from a power-deficit to a power-sufficient** nation, with the energy **demand-capacity gap** now at just 0.1%.
- The **total installed capacity has reached 470 GW**.
- In 2024–25, **thermal sources** (coal, gas, etc.) produced 12,41,261 Million Units (MU), while **nuclear and hydro** contributed 51,962 MU and 1,39,780 MU respectively.
- Renewables** produced 2,30,868 MU, with solar (1,27,339 MU) and wind (78,214 MU) leading.

- The renewable share rose from 11.5% (2021–22) to 13.78% (2024–25).
- India's **five regional power grids**—North, South, East, West, and North-East—were gradually interconnected, forming a unified National Grid by 2013, operating at 50 Hz.
- The **Power Grid Corporation of India** manages it.
- However, Lakshadweep and Andaman & Nicobar islands remain off-grid due to geographic isolation.

Share of energy produced from different sources, 2021-22 to 2024-25*
In 2024-25*, around 71% of the country's total energy was produced through Coal

■ Coal ■ Other thermal ■ Renewable (excl. Hydro) ■ Hydro ■ Nuclear
■ Bhutan Import



*Up to February 2025

Treasury Bill (T-bill) “Rollover”

- India has renewed a **\$50 million Treasury Bill (T-bill)** for the Maldives for another year via the **State Bank of India (SBI)**.
- This is part of a **Government-to-Government financial assistance program** started in **March 2019**, under which India has subscribed to and **rolled over** these T-bills annually
- A **Treasury Bill** is a short-term debt instrument issued by a government.
- A **rollover** means when the T-bill matures, instead of taking back the money, India reinvests it in a new T-bill, effectively **extending the loan**.
- Importantly, this support is **interest-free**, meaning the Maldives does not pay any extra cost to India.
- This financial assistance is meant to help the **Maldives meet its short-term budgetary and liquidity needs**.

Adjusted Gross Revenue (AGR)

- The Supreme Court (SC) recently rejected pleas by major telecom companies for **relief in the payments of their adjusted gross revenue (AGR) liabilities**.
- In 1999, India shifted telecom licensing from a **fixed license fee model to a revenue-sharing model**, where telecom operators pay a percentage of their AGR as fees (like license fee and spectrum usage charges) to the government.
- **Telecom companies argued** AGR should only include revenue from core telecom services (like calls, data, SMS).
- But the **government claimed** AGR must include all revenues, including non-core income like: Interest income, Sale of handsets, Rental income, Value-added services, Dividend earnings etc.
- The **Supreme Court in 2019** sided with the government, saying AGR includes all revenues, not just telecom-related.
- This led to **huge dues** (in thousands of crores) for companies like Airtel, Vodafone Idea, and Tata Teleservices.

Revised Economic Capital Framework (ECF) of the Reserve Bank

- The Reserve Bank of India (RBI) has recently taken a step **to strengthen its financial resilience** by revising its Economic Capital Framework (ECF) and risk provisioning norms.
- The ECF has been built on the 2019 framework established by the **Dr. Bimal Jalan Expert Committee**.
- The ECF governs how much capital the RBI should maintain to **cover its various risks** and how much of its **surplus income can be transferred** to the Government of India.

Key Changes:

- **Inclusion of Minor Currencies:** Foreign currency assets in minor currencies will now be considered in market risk assessments.
- **Flexible Resilience Range:** The Central Board can maintain market risk buffers within a range defined by **Expected Shortfall (ES) at 99.5% and 97.5% confidence levels**.

➤ This offers flexibility based on prevailing market conditions.

- **Widened Buffer Range:** The buffer range for monetary and financial stability risks has been expanded from the earlier **4.5%-5.5% to 3.5%-6.5%** of the balance sheet size.

- **Contingent Risk Buffer (CRB):** The CRB, which covers buffers for monetary, financial, credit, and operational risks, will now be maintained in the range of **6% ± 1.5% (4.50%-7.50%)** of the balance sheet size, replacing the earlier fixed level of 6.5% (with a lower bound of 5.5%).

- **Equity Threshold for Surplus Transfer:** Surplus will only be transferred to the government if the RBI's available **equity (capital) exceeds 7.5% of the balance sheet size**, after accounting for any shortfall in market risk buffers.

➤ The buffer was gradually increased from 5.5% (2018–22) to 6.5% (2023–24).

Liberalised Remittance Scheme (LRS)

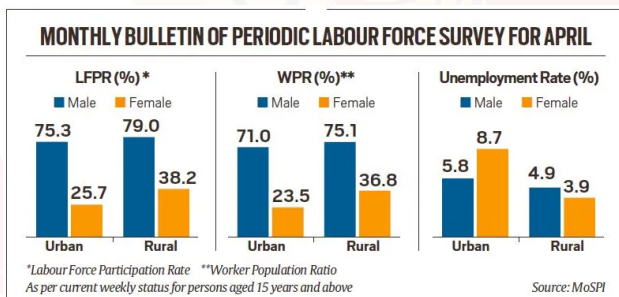
- Foreign remittances of Indian residents through **the Reserve Bank of India's (RBI) Liberalised Remittance Scheme (LRS)** dipped drastically in February 2025.
- Under the Liberalised Remittance Scheme, **all resident individuals**, including minors, are allowed to **freely remit up to USD 2,50,000 per financial year** (April – March) for any permissible current or capital account transaction or a combination of both.
- The Scheme was introduced on February 4, 2004, with a limit of USD 25,000.
- Currently, clients making remittances through LRS **can now deploy up to \$2.5 lakh each year** for economic purposes such as overseas education and overseas medical treatment, acquisition of overseas real estate, or **even purchases of foreign security**.
- The Scheme is **not available to corporates**, partnership firms, Hindu Undivided Families (HUF), and Trusts.
- Data shows that the numbers of Indian students who have been issued study permits in these countries **have fallen by at least 25%** in 2025, thereby reducing the flow of funds to other countries for education purchase.

Periodic Labour Force Survey – April 2025

- India's unemployment rate stood at **5.1%** in April for persons **aged 15 years and above**, with the **rate for males at 5.2%** and for **females at 5.0%**.
- PLFS** was released by the National Statistics Office (NSO) under the Ministry of Statistics and Programme Implementation (MoSPI).

Key indicators of the Report:

- Labour Force Participation Rate (LFPR):** LFPR is defined as the percentage of persons in the labour force (i.e. working or seeking or available for work) in the population.
- Worker Population Ratio (WPR):** WPR is defined as the percentage of employed persons in the population.
- Unemployment Rate (UR):** UR is defined as the percentage of persons unemployed among the persons in the labour force.
- Activity Status- Usual Status:** The activity status of a person is determined on the basis of the activities pursued by the person during the specified reference period. When the activity status is determined on the basis of the reference period of the last 365 days preceding the date of survey, it is known as the usual activity status of the person.
- Activity Status- Current Weekly Status (CWS):** The activity status determined on the basis of a reference period of last 7 days preceding the date of survey is known as the current weekly status (CWS) of the person.



RBI Balance Sheet Growth

- The Reserve Bank of India (RBI) recently released its **Annual Report for 2024-25**, a statutory report of its Central Board of Directors.

Key Findings:

- Financial Performance:** In FY25, the RBI's **balance sheet expanded by 8.2%** to ₹76.25 lakh crore.
 - This growth facilitated a **record transfer of ₹2.69 lakh crore to the central government**, aiding in fiscal consolidation.
- Inflation Management:** The RBI's proactive monetary policy successfully moderated inflation, **bringing it below the 4% target** in February and March 2025.
- Currency Management Reforms:** The RBI announced the **cessation of printing ₹2, ₹5, and ₹2,000 denomination notes**. By March 2025, **98.2% of ₹2,000 notes had been returned to banks**, signaling their near-total withdrawal from circulation.
 - The ₹500 note has become the dominant currency, comprising **40.9% of all notes and 86% of the value in circulation**.
 - Additionally, the RBI is promoting sustainability by **recycling old notes into furniture material** and advancing its **'Sa-Mudra' project** to digitize and automate currency management.
- Expansion of Digital Rupee (₹):** The RBI has intensified efforts to expand the scope of its **Central Bank Digital Currency (CBDC)** for both **retail (₹-R) and wholesale (₹-W)**.
- Financial Sector Frauds:** The RBI has noted an increase in banking frauds, with the number of instances rising to 36,075 in FY24, **up from 13,564** in the previous year.

US-Ukraine minerals deal

- The two nations decided to establish the **United States-Ukraine Reinvestment Fund**.
- The deal represents “**payback**” for the **\$350bn** that US president Donald Trump ‘claims’ Washington has spent on supporting Ukraine’s war effort.
- Ukraine **holds deposits of 22 of the 34 minerals classified as critical** by the EU which made up approximately 5 percent of the global supply as of 2022.
- Ukraine also **accounts for 7 percent of the global production of titanium** and one of the largest reserves of **Lithium** in the region.
- Features:
 - The U.S. contributes funds (and possibly military aid value) to a joint investment fund with Ukraine.
 - This fund will be jointly managed by Ukraine and the US on an equal partnership basis.
 - Ukraine will maintain full ownership and control of the country’s resources and will determine what and where minerals may be extracted.
 - Profits from those projects are shared, and reinvested in Ukraine’s reconstruction for 10 years.
- Essentially, the deal is **not a purchase**, but a **strategic investment** partnership — the U.S. gets **long-term access to vital minerals**, and Ukraine gets **capital and reconstruction support**.



FATF Grey List

- As part of the strategy to **curb financial flows that aid terror activities**, India is planning to bring back **Pakistan into the ‘grey list’** of the **Financial Action Task Force (FATF)**.
- The FATF is commonly referred to as the **world’s “terrorism financing watchdog”**, which means it is the author and custodian of an international regime that works to ensure that the flows of money in the global financial system are not misused to fund terrorist activities.
- Countries that fail to **address strategic deficiencies** in their regimes to counter money laundering, terrorist financing, and proliferation financing, and are under increased monitoring, are placed in the FATF grey list.
 - ◆ Currently, it includes Nepal, Lebanon, South Africa, Syria and Vietnam, among others.
- Pakistan was placed in the FATF’s grey list in 2018** and taken off in 2022, which gave confidence to global lenders to disburse loans to cash-strapped Islamabad.
- The FATF blacklist countries are officially known as **High-Risk Jurisdictions subject to a Call for Action**, which acts as a deterrent for countries doing business with the listed countries because of their non-cooperation in the global fight against financial crimes.
 - ◆ Currently Democratic People’s Republic of Korea, Iran & Myanmar are on the Blacklist.
- The FATF meets thrice a year – in February, June and October – to make decisions.

February 2025 FATF Grey List Update: Solving the Equation of Addition and Deletion of Countries

Countries Contained in the FATF Grey List as of October 2024	+	Countries Added to the FATF Grey List as of February 2025 • Lao PDR • Nepal	-	Countries Removed from the FATF Grey List as of February 2025 • Philippines
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Jurisdictions under Increased Monitoring as of 21st February 2025

Algeria	Angola	Bulgaria	Burkina Faso	Cameroon
Côte d'Ivoire	Croatia	Democratic Republic of the Congo	Haiti	Kenya
Lao PDR	Lebanon	Mali	Monaco	Mozambique
Namibia	Nepal	Nigeria	South Africa	South Sudan
Syria	Tanzania	Venezuela	Vietnam	Yemen

Asian Productivity Organization (APO)

- India has formally assumed the **Chairmanship of the Asian Productivity Organization (APO)**, for the 2025-26 term during the ongoing 67th Session of the Governing Body Meeting of the organisation held in Jakarta, Indonesia.
- The Asian Productivity Organization (APO) is a **union of 21 Asian countries headquartered in Tokyo** that joined forces **to promote socio-economic development** in the region and among members.
- It was established in 1961, as a regional, inter-governmental organization and is considered to be non-political, non-profit, and non-discriminatory.
- It aims to make its members **more productive and competitive** and sets out to achieve this by **conducting research, offering advice, promoting sustainable (green) development**, and encouraging members to share information and technology among themselves.
- It is composed of the governing body, the National Productivity Organizations (NPOs), and the secretariat, which is **headed by a secretary-general**.



Article 51 of the United Nations Charter

- Pakistan stated that it has the right to self-defend under **Article 51 of the U.N. Charter** in response to **Operation Sindoor** conducted by India.
- Article 51 of the United Nations Charter, adopted in 1945, allows any UN member country to **defend itself** if it is **attacked**.
- This can be done **individually or with allies** (collective self-defence).

- However, if a country takes action under Article 51, it **must immediately inform the UN Security Council** about what it did and why.
- Pakistan claimed that the Indian AirForce operation while **conducted within the Indian Airspace** was unprovoked and targeted **civilian population** in Pakistan across international border and Line of Control.
- It claimed to **reserve the right to respond at a time and place of its choosing** under Article 51.

India-UK Free Trade Agreement

- India and the UK finalized the India-UK Free Trade Agreement (FTA), seeking to double the bilateral trade by 2030.
- India, the **11th largest trade partner** of the UK in 2024, has a **trade surplus**.
- Trade between the two nations totalled £42.6 billion in 2024 with total UK exports to India amounted to £17.1 billion, while total UK imports from India amounted to £25.5 billion in 2024.
- The two countries formally announced the conclusion of the **Double Contribution Convention** alongside their FTA.

- This will eliminate the requirement for Indian professionals on short-term assignments in the UK **to pay social security contributions** in the UK if they are doing so in India

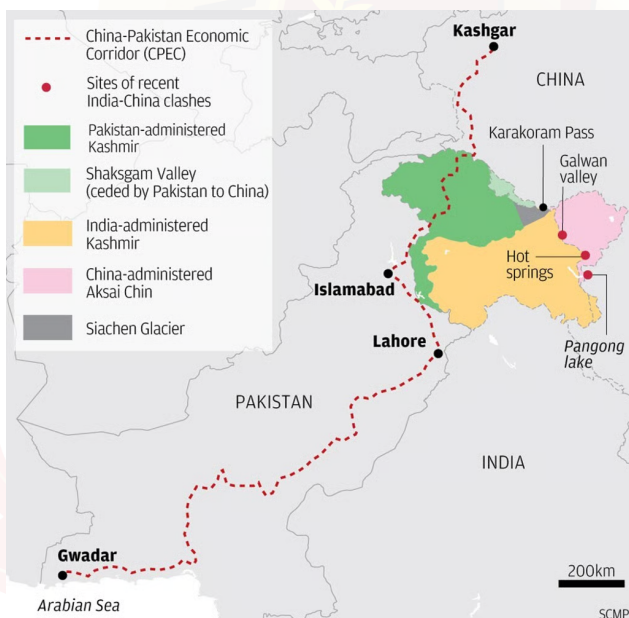
Highlights of the India-UK FTA:

- Zero-duty market access:** Approximately 99% of Indian exports will enjoy zero-duty access to the UK market, enhancing export competitiveness.
- Tariff reductions for Indian imports:** Import duties on 90% of tariff lines will be reduced, with 85% of these becoming completely tariff-free over the next 10 years, offering notable savings for Indian consumers and businesses.
- Lower tariffs on key UK exports:** India has agreed to lower tariffs on a range of high-value British exports, including **whisky, medical devices, advanced machinery**, and lamb, making these products more competitive in the Indian market.

- 🔗 **Automotive tariff reductions:** Tariffs on automobiles will drop significantly, from over 100% to 10% **under a special quota system**, reducing costs for UK automakers exporting to India.

CPEC Expansion to Afghanistan

- Pakistan and China have agreed to extend the China-Pakistan Economic Corridor (CPEC) to Afghanistan in an effort to deepen the trilateral relationship.
- CPEC is an ambitious project that aims **to connect China's Xinjiang province to Gwadar Port in Pakistan's Balochistan province** through roads, railways, and energy projects.
- The \$46 billion infrastructure project, launched in 2015, has increased to over \$62 billion in investments.
- The 3000-km-long connectivity project is touted as a means **to accelerate Pakistan's fragile economy** and give China direct access to the Arabian Sea.
- India has been severely critical of the CPEC Project of the **Belt and Road Initiative (BRI)** as it passes through **Pakistan-occupied-Kashmir (PoK)**.



New Development Bank (NDB)

- The New Development Bank (NDB), established by BRICS nations, has recently **admitted Algeria as a new member**.
- NDB was established in 2015 by BRICS countries (Brazil, Russia, India, China and South Africa), headquartered at **Shanghai** and regional offices at Johannesburg (South Africa), Sao Paulo (Brazil), Ahmedabad (India) and Moscow (Russia)
- It is a **multilateral development bank** aimed at mobilizing resources for infrastructure and sustainable development projects in BRICS and other **emerging markets and developing countries (EMDCs)**.
- The bank's membership is **open to all United Nations member states**, including both borrowing and non-borrowing members.
- However, the BRICS countries (Brazil, Russia, India, China, and South Africa) must retain at least 55% of the total voting power.

Dag Hammarskjöld Medal

- Two Indian peacekeepers were posthumously awarded the **Dag Hammarskjöld Medal** in recognition of their supreme sacrifice in the service of global peace on the **International Day of UN Peacekeepers**.
- The Dag Hammarskjöld Medal was established by **UN Security Council Resolution 1121** in 1997.
- The Medal is named after the **second UN Secretary-General, Dag Hammarskjöld**, who died in a 1961 plane crash while on a peace mission.
- The medal is **awarded annually to military, police and civilian personnel** who make the **ultimate sacrifice** while serving in UN peacekeeping operations.
- Note: The International Day of United Nations Peacekeepers** is observed on May 29 and is dedicated in the honour of more than 4,300 peacekeepers who have lost their lives while serving under the UN flag since 1948.

History & Culture

Telangana's Satavahana Heritage

- The ASI has documented 11 inscriptions in **Telangana's Gundaram Reserve Forest**, dating from the **1st century BCE to the 6th century CE**.
- These inscriptions shed light on the **Deccan's early cultural and political history**, especially the **Satavahana period**.
- Found on a rock surface called **Sitammalodi**, two notable inscriptions include one in early **Brahmi script by a Hāritiputra lineage figure**—likely of the Chuṭu dynasty—who donated a cave for Buddhist monks and was a friend of Satavahana prince Kumāra Hakusiri.
- Another features a **trident and damaru**, indicating early links between political authority and religion.
- Mentions of Satavahana royals like Kumāra Sakasiri and Akusiri highlight the region's historical importance.
- **Note: King Simuka** founded the Satavahana Kingdom in Telangana and later kings conquered and expanded the regions of Upper Maharashtra, Lower Central India and Vidarbha.

Ramman Festival



- The **annual religious festival** of Uttarakhand, Ramman, was recently celebrated at the **Bhumiya Devta Temple**.
- Ramman is an annual religious folk festival celebrated in the twin villages of **Saloor-Dungra, Uttarakhand**, in honour of **Bhumiya Devta** after Baisakhi.

- Recognised by UNESCO as **Intangible Cultural Heritage in 2009**, it features traditional mask dances based on episodes from the **Ramayana**, performed without dialogue to the rhythm of songs and drums.
- The festival dates back to the **8th century**, linked to **Adi Shankaracharya** and the **construction of Badrinath Temple** and rise of Vaishnavism.
- Over 18 handmade wooden masks—crafted from **Himalayan Birch and mulberry**—are used, including the **25-kg Narasin Devta mask**, which is worshipped before the festival.
- ➔ Only the **Bhandari community** has the rights to don this mask

Pushkar Kumbh Mela

- The Pushkar Kumbh Mela was recently celebrated in Uttarakhand after a 12-year hiatus.
- The festival is being held at **Keshav Prayag in Mana village**, near Badrinath Dham, at the confluence of the **Alaknanda and Saraswati rivers**.
- The Pushkar Kumbh is a significant event in Hindu tradition, attracting Vaishnavite devotees, particularly from southern India.
- Pilgrims believe that participating in the festival **purifies the soul and grants moksha** (liberation).
- Mana village holds deep spiritual significance, as it's believed to be associated with **Maharishi Ved Vyas**, who composed the Mahabharata while meditating at Keshav Prayag.
- It is also believed that South Indian scholars **Ramanujacharya and Madhvacharya** received divine knowledge from Goddess Saraswati at this location.

Tankai method: Stitched ship



- The Indian Navy inducted its first **‘stitched ship’** built using the ancient **Tankai method**, reviving a 2,000-year-old Indian shipbuilding tradition.
- Inspired by the text **Yuktikalpataru** (9th century) and foreign accounts of Indian stitched ships, the ship named **INSV Kaundinya** is modeled after a ship in Ajanta cave paintings of 5th century CE.
- It was built under a tripartite pact between the Indian Navy, Ministry of Culture, and a Goa-based shipbuilder.
- **Tankai Method** uses stitched planks of teak/sal/mango wood tied with **coir ropes**, sealed with cotton, resin, and fish oil.
- **No metal fasteners** are used making the ships flexible, rust-resistant, and durable.
- Ships are built **hull-first, followed by ribs**—opposite of Western methods.
- Her sails display motifs of the **Gandabherunda and the Sun**, her bow bears a sculpted **Simha Yali**, and a symbolic Harappan style stone anchor adorns her deck, each element evoking the rich maritime traditions of ancient India.
- ★ **Note:** **Gandabherunda** is a two-headed bird symbol in Hindu mythology, particularly associated with Vishnu and the royal insignia of Mysore.
- Named after Kaundinya, the **legendary Indian mariner who sailed across the Indian Ocean to Southeast Asia**, the ship serves as a tangible symbol of India’s long-standing traditions of maritime exploration, trade, and cultural exchange.

Karni Mata Temple



Why are rats worshipped here?

Legend says Karni Mata revived her stepson Lakhan as a rat — and decreed that her lineage would be reborn as kabas (rats), avoiding the cycle of death and rebirth.

Devotees believe these rats are her family, reborn in a divine loop.

- The Indian Prime Minister recently visited the **Karni Mata temple in Deshnok**, a small town about 30 km from Bikaner, Rajasthan.
- The Karni Mata Temple is famously known as the **“rat temple”** for housing thousands of sacred **rats (kabas)**, believed to be **incarnations of Karni Mata’s family**.
- **Karni Mata (Ridhi Kanwar/Ridhu Bai)**, born in **1387 CE** in Suwap village to a Charan family, is revered as an incarnation of Goddess Durga.
- Most accounts of her life come from **oral tradition and texts like Karni Mata Charitra**, which describe her as a miracle-working saint who supported rulers like Rao Jodha (founder of Jodhpur) and Rao Bika (founder of Bikaner).
- The current temple structure was built in the early **20th century by Maharaja Ganga Singh of Bikaner**.

Santara/ Sallekhana

- A three-year-old girl with a brain tumour recently died after being initiated into Santara, also known as Sallekhana—a **Jain ritual of voluntary fasting unto death** for spiritual purification and detachment.
- Practised **since ancient times**, it involves gradually reducing food and water intake, with no desire for rebirth or heaven, only meditation on Arhat.
- **Arhats or Arihants**, including the **Tirthankaras**, are **not gods** in the typical theistic sense.
- They are enlightened beings who have **conquered all inner passions** and attained **Kevala Jnana** (infinite knowledge), but are **still living**.
- After death, they become **Siddhas**, liberated souls who reside in **Siddha Lok**, free from the cycle of birth and death.
- Santara is undertaken with full awareness and spiritual intent, typically when a person faces **old age, incurable illness, or unbearable hardship**.
- The goal is to achieve **detachment from the body and worldly desires**, purify the soul, and prepare for **liberation (moksha)**.
- Historical figures like Bhadrabahu and Chandragupta Maurya observed it.

- The 2nd-century Sangam text **Sirupanchamoolam** also refers to the practice.
- In 2015, the Rajasthan High Court banned Santhara under IPC Sections 306 and 309, but the Supreme Court stayed the order after appeals by Jain groups.

Sallekhana, meaning 'thinning out' or 'shedding,' emphasizes the gradual renunciation of bodily and emotional attachments, while **Santhara**, meaning 'passing through,' highlights the spiritual transition from life to death with detachment—yet both refer to the same Jain practice of voluntary fasting unto death.

Geography

Humid Heat Waves

- A new study in **Nature Communications** finds that **rainfall and soil moisture influence the onset of extreme humid heat** in tropical and subtropical regions, with important implications for India.
- **Humid heat waves** are periods when **high temperatures coincide with high humidity levels**.
- This combination makes it difficult for the human body to cool down because **sweating becomes less effective** in evaporating moisture from the skin.
- As a result, the body can overheat, leading to **serious health risks** (heat stress or heat stroke) above **wet-bulb temperatures** (Twb) of 31°C for healthy individuals and lower for vulnerable groups

◆ **Wet-bulb temperature (Twb)** is the lowest temperature air can reach through the evaporation of water at constant pressure. It reflects the combined effect of **temperature and humidity** on how cool the air feels.

◆ When humidity is high, the wet-bulb temperature is close to the actual air temperature, meaning evaporation (and thus cooling by sweating) is less effective. It's an important measure for assessing heat stress on the human body.

- In **dry regions like northwestern India**, **humid heat waves often follow rainfall**, which adds surface moisture that evaporates and raises humidity.
- In **wetter areas**, such events occur **after at least two days of little or no rain**.

Inter-Governmental Oceanographic Commission (IOC)

- **Indian National Centre for Ocean Information Services (INCOIS)** has been selected by **Inter-Governmental Oceanographic Commission (IOC)** of UNESCO for a major global submarine cable initiative.



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- IOC, the only **UN body specialized in ocean science** and services. headquartered in France, launched Ocean Decade Tsunami Programme (ODTP) in 2021.
- Ocean Decade Tsunami Programme (ODTP) as part of the **Decade of Ocean Science for Sustainable Development (2021–2030)** – an effort to **bolster the global tsunami warning system** by reducing response times and enhancing community readiness.
- **INCOIS** was established in Hyderabad **1999** as an autonomous organization under the **Ministry of Earth Sciences** to provide critical ocean information and advisory services.
- INCOIS will now take up 3 of 10 major projects under ODTP

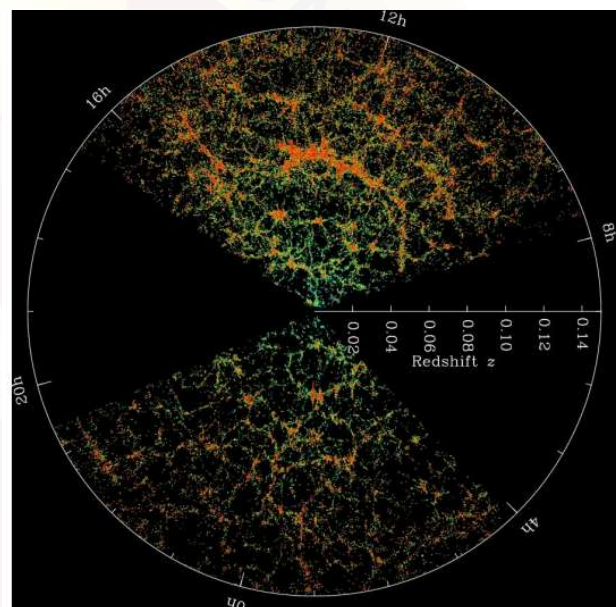
Projects:

- **Submarine Cable Observatory:** A 150 km multi-parameter cable west of **Wandoor**, Andaman, at 2,000–2,500 m depth, with real-time monitoring from INCOIS Hyderabad, to study ocean dynamics and seismic activity linked to tsunamis.
- **People Centred Tsunami Early Warning (PCTWIN):** Focuses on improving disaster risk knowledge, detection, forecasting, communication, and preparedness.
- **Tsunami Ready Odisha (TRO):** Enhances coastal community resilience and awareness, linked to UNESCO-IOC's Tsunami Ready Recognition Programme, in collaboration with Odisha's disaster agency.

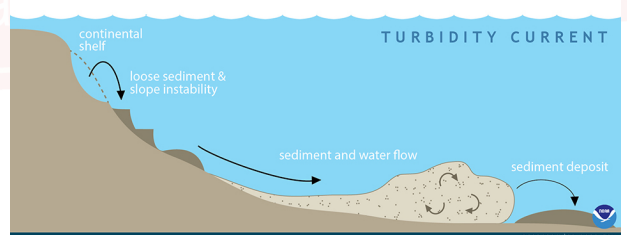
Universe's Clumpiness

- Recent measurements of matter clustering of universe using gravitational lensing and galaxy surveys indicates what scientists call an S_8 tension.
- Scientists have found that **matter in the universe isn't spread out evenly**—it forms **clumps** like galaxies and galaxy clusters, while some areas are mostly empty.
- Early on, the universe was very smooth, as seen in the **cosmic microwave background (CMB)**, the leftover light from the Big Bang.
- Over time, **gravity pulled matter together**, creating the clumps we see today.

- The **Λ CDM (Lambda Cold Dark Matter) model** is considered the standard cosmological model used to explain the structure and evolution of the universe.
- It **assumes the universe is made up of about 5% normal matter, 27% dark matter, and 68% dark energy** (represented by Lambda, Λ).
- To measure how clumpy the universe is, scientists use a **number called Sigma 8 (S_8)**.
 - 👉 A high S_8 means matter is very clumpy; a low S_8 means it's more spread out.
- But here's the problem—when scientists measure S_8 in different ways, they get different results.
- This mismatch is called the **" S_8 tension."**
- If this difference isn't just a measurement error, it might mean that our current model of the universe, the Λ CDM model, which says most of the universe is made of dark matter and dark energy, might be **incomplete or needs updating**.



Turbidity Currents

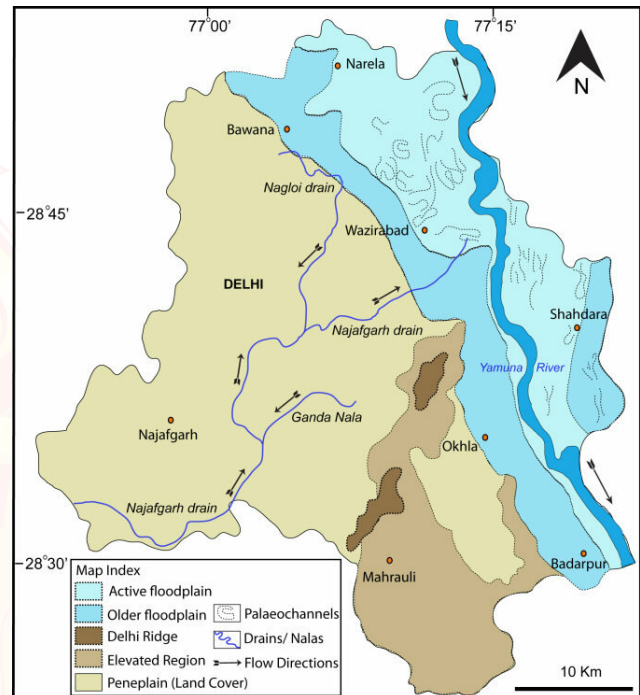


- A new study has found the **first direct evidence of an underwater microplastics “avalanche”** in **Whittard Canyon**, a deep-sea trench off the southwest coast of Ireland between the Celtic Sea and the Atlantic Ocean.
- This event was caused by a **turbidity current** — a fast, downhill flow of dense, sediment-filled water triggered by things like earthquakes or collapsing slopes.
- These currents carry sediments, nutrients, and now even plastic waste to the deep ocean, changing the seafloor’s shape.
- **Turbidity refers to how cloudy or dense the water is** due to particles like sediment or plankton.

Morphological Ridge

- The Supreme Court issued a show cause notice to Delhi officials for **allegedly violating its 1996 directive in the M.C. Mehta vs Union of India case** by allowing construction in the Morphological Ridge area.
- A **ridge** is a long, narrow elevated landform, usually a chain of hills or mountains, that stands higher than the surrounding terrain.
- **The morphological ridge is a general geological term referring to ridge-like landforms** identified based on their shape, structure, and physical features (morphology), rather than official forest status or land use.
- The **Aravalli hill range contains the Delhi Ridge** as its tail-end and an ecologically critical zone.
- It works as a **green lung** for the capital and a **natural barrier against hazards** such as desertification and pollution.
- Entering Delhi from **Gurgaon** in the southwest, this Ridge stretches for around **35 km from the south of Mahipalpur to southeast of Tughlakabad**, petering out in Wazirabad on the western bank of Yamuna.
- The **Morphological Ridge**, on the other hand, is a geologically **extended Ridge area**.
- It is **not officially notified as forest land** but enjoys protection under several High Court and Supreme Court rulings over the past decade.
- The extent of the Morphological Ridge is based on a **Delhi Forest Department map**, itself based on the seismic zonation map of Delhi 2006, undertaken under the Geological Survey of India.

- It is marked as **“gair mumkin pahad” (uncultivable rocky hill)** in records.



Palaeofires

- Scientists found strong proof of **very ancient wildfires called Palaeofires** that happened about **250 million years ago in the Godavari Basin** in India.
- These old fires affected the Earth’s environment and climate long ago.
- When **plants burn**, they leave behind **tiny bits of charcoal** and other organic material that get trapped in layers of rock and soil.
- By studying these layers, scientists can learn about the wildfires that happened millions of years ago.
- They used **special tools to look closely at these tiny particles**, such as pollen, plant bits, and charcoal from fires.
- They found **three main types of particles**:
 - **Plant debris** (Translucent Organic Matter)
 - **Charcoal made by ancient fires** (Palaeofire Charcoal)
 - **Charcoal that might have been moved around after burning** (Oxidised Charcoal)
- The study also showed that **back then, the Earth’s atmosphere had more oxygen**, which likely made **wildfires happen more often** and burn more intensely.

- So, by studying these ancient fires, scientists better understand how Earth's climate and ecosystems evolved over millions of years.

The Bharat Forecast System

Precision technology

The BFS developed by the Indian Institute of Tropical Meteorology, aims at improving weather forecast models

EXISTING FORECAST MODELS

- Use square grids of 12-km sides to map a region
- Use equal-sized grids to map regions
- Able to give block-level forecasts 5 days ahead



BFS MODEL

- Breaks down a region into 6-km sides for mapping, leading to a four-fold improvement
- Uses a triangular-cubic octahedral structure
- Able to give forecasts up to the level of panchayats

- The India Meteorological Department (IMD) has adopted the **Bharat Forecast System (BFS)**, an advanced, indigenously developed weather model with a 6 km resolution—better than global models (9–14 km).
- Developed by **Indian Institute of Tropical Meteorology (IITM), Pune**, BFS replaces the older 12 km model and uses **powerful computers 'Arka' and 'Arunika'**.
- It offers 64% better accuracy, especially for **extreme weather, and delivers short-term (3 days), medium-term (7 days), and nowcasting (2 hours) forecasts**.
- The system **utilizes a Triangular-Cubic Octahedral (TCO) grid structure**, focusing higher resolution over tropical regions like India.
- It also includes data from a network of **40 Doppler Weather Radars (expandable to 100)**.

Madden-Julian Oscillation (MJO)

- The southwest monsoon arrived in Kerala on May 24, eight days earlier than the normal onset date and one of the key drivers was the **Madden-Julian Oscillation (MJO)**, according to the India Meteorological Department (IMD).
- The MJO is a **moving system of winds, clouds, and pressure** that brings rain as it circles around the equator.
- The phenomenon takes its name from the **two scientists who identified it in 1971** — Roland Madden and Paul Julian.

- The system typically travels **eastward at a speed of 4-8 metres per second**.
 - It goes around the globe in 30-60 days on average, but can sometimes take 90 days.
 - As it moves, **strong MJO activity often splits the planet into two parts** — one in which the **MJO is in active phase** and brings rainfall, and the other in which it suppresses rainfall.
 - An active phase is generally **followed by a weak or suppressed phase**, in which there is little MJO activity.
 - The effect of the MJO is witnessed mainly in the **tropical region, in the band between 30 degrees North and 30 degrees South** of the equator, even though the mid-latitude regions in both hemispheres also feel its impact.
- 📍 India falls in this band.
- As the MJO cycle lasts only 30-60 days, there can be multiple MJO events in a season.
 - In the tropics, **MJO in its active phase brings frequent cyclonic activity**, and can initiate the onset of the monsoon as was the case of Kerala.

Early onset of Monsoon:

- The southwest monsoon arrived in Kerala on **May 24**, eight days earlier than the normal onset date, according to the India Meteorological Department (IMD).
- The IMD uses a **3 fold criteria** to declare the arrival of Monsoon.
 1. **Rainfall:** At least 60% of the 14 designated southern meteorological stations (including Thiruvananthapuram, Kochi, Mangalore, etc.) must report >2.5 mm rainfall for two consecutive days.
 2. **Wind Field:** Westerly winds must dominate up to 600 hPa pressure level, and wind speed at 925 hPa must range between 15–20 knots (27–37 km/h).
 3. **Outgoing Longwave Radiation (OLR):** OLR values must be below 200 W/m², indicating active convection and cloud cover, which is favorable for monsoon onset.
- This is the **earliest arrival of Monsoon since 2009** and IMD has forecast an above normal monsoon for this year.

- However, **an early on-set does not guarantee a surplus monsoon** as 2009 ended up being a deficient year.
- The department defines average or normal rainfall as ranging between 96% and 104% of a 50-year average of **87 cm (35 inches)** for the **four-month (June-September) season**.
- These four-months deliver **over 70% of overall rainfall** in India.
- Interestingly, IMD only counts the rainfall within these 4 months as monsoon rainfall and the rain falling in May is counted as **part of pre-monsoon rainfall**.



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Environment & Ecology

New Genome-Edited Rice Varieties

- The **Union Agriculture Minister** recently released two genome-edited varieties of rice, the first achievement of its kind in the country.
- These two **climate-resilient** varieties have been developed by the **Indian Council of Agricultural Research (ICAR)** using cutting-edge genome editing technology.
- These have been named '**Kamala**' and '**Pusa DST Rice 1**'.
- They have better **stress tolerance**, **improved yields**, and climate adaptability without any compromises with their existing strengths.
- **DRR DHAN 100 (KAMALA)** has been developed using genome editing technology targeting the **Cytokinin Oxidase 2 (CKX2) gene** (also known as Gn1a), to increase grain numbers per panicle.
- The resulting mutant line demonstrated superior yield performance, drought tolerance, high nitrogen-use efficiency, and **maturity ~20 days earlier (around 130 days)** than its parent variety, **Samba Mahsuri (BPT 5204)**.
- **PUSA DST RICE 1:** This new genome-edited variety has been developed over the widely cultivated fine-grain variety called MTU1010.
- Developed through **Site Directed Nuclease 1 (SDN1)** genome-editing, it targets the Drought and Salt Tolerance (DST) gene to improve the plant's resilience to harsh soil and climate conditions.
 - 👉 The new variety is relevant for farmers of saline and alkaline soils, where traditional varieties underperform.

Asiatic Lion Population Surge in Gujarat 2025

- The population of Asiatic lions (**Panthera leo persica**) in Gujarat has **increased to 891 from 674** in 2020 according to the 16th census conducted recently.
- Recording an increase of 217 lions, around **32% compared to the 15th lion census**, the tally this time includes 196 males, 330 females, 140 sub-adults and 225 cubs.

- The number of adult **females has increased from 260 to 330 (26.92%)**, reinforcing the population's reproductive capacity.
- Until the 19th century, it lived across Saudi Arabia, eastern Turkey, Iran, Mesopotamia, and from eastern Pakistan to Bengal and central India. Since the early 20th century, its range has been limited to **Gir National Park & Gir and Pania Wildlife Sanctuary** and adjoining areas.
- Currently, there are only two recognized subspecies of lions: the vulnerable and genetically diverse **African lion (*Panthera leo leo*)** and the endangered **Asiatic lion (*Panthera leo persica*)**



Climate Physical Risks

- The World Bank states **over 80% of India's population** lives in districts vulnerable to climate-induced disasters.
- **Climate Physical risk (CPR)** refers to potential damage and disruption to people, property, and productivity from climate hazards like floods, droughts, and wildfires.
- This causes **direct costs such as repairs and indirect costs** like supply chain disruptions.
- Over time, assets may lose value and become uninsurable.
- According to the **Intergovernmental Panel on Climate Change (IPCC)**, climate risk depends on **hazard, exposure** (who/what is at risk), and **vulnerability** (ability to withstand and recover), together defining the full risk scale.

- ★ The IPCC is a United Nations body established in **1988** to assess scientific information related to climate change

Blue Talks

- The **Ministry of Earth Sciences (MoES)** in collaboration with the **Embassies of France and Costa Rica** in India, hosted the Second Blue Talks recently at **Prithvi Bhawan, New Delhi**.
- This event aimed to serve as a milestone in the lead-up to **the 3rd United Nations Ocean Conference (UNOC3)**, which will be held in Nice, France in June 2025.
- Blue Talks is a **multilateral consultation platform** that brings together governments, scientists, and civil society to **build consensus for sustainable ocean use**.
- The **first Blue Talks** were held in India in February, 2024.

United Nations Ocean Conference (UNOC):

- UNOC is an important UN conference that specifically focuses on the implementation of **Sustainable Development Goal 14: Life Below Water**.
- It held its **first conference in New York in 2017 (UNOC1)** and its second in 2022 in Lisbon (UNOC2).
- UNOC3 (2025) will be held in Nice and will focus on **"Accelerating action and mobilising all actors to conserve and sustainably use the ocean"**.

Operation Olivia

- **The Indian Coast Guard (ICG)**, under its Operation Olivia in Odisha, has successfully protected over six lakh Olive Ridley turtles this February.
- Operation Olivia initiated in the early 1980s is an **annual mission conducted from November to May**.
- It is aimed at ensuring safe nesting grounds for Olive Ridley turtles, particularly at **Gahirmatha Beach**.

The Olive Ridley (*Lepidochelys olivacea*):

- ★ It is listed as **vulnerable** under the **International Union for Conservation of Nature's Red list**.
- ★ There are **seven species** of Marine Turtles in the world and 5 are found in India.
- ★ All **five species** of sea turtles found in India are included in **Schedule I of the Indian Wildlife Protection Act, 1972**, and in the Appendix I of the Convention of International Trade in Endangered Species of Wild Fauna and Flora (CITES), which prohibits trade in turtle products by signatory countries.



**Best Mains Results in Kerala from:
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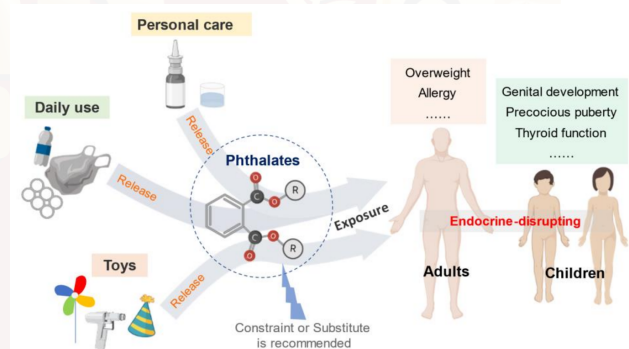
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Science & Technology

Phthalates and Cardiovascular Deaths

- A new study has found that daily **exposure to phthalates** has been related to over 13% deaths in the world due to heart disease in 2018, among those aged 55-64.
- **Phthalates** are a group of chemical compounds primarily used to make plastics like **polyvinyl chloride (PVC)** more flexible, durable, and long-lasting.
- India had the highest count at 103,587 deaths, followed by China and Indonesia.
- The study focused on a kind of **phthalate** called '**di-2-ethylhexyl phthalate (DEHP)**'.
- DEHP is used for making plastics in items, such as **food containers, softer** and others.
- Data, including those from urine samples, was analysed to discern amounts of products formed due to a chemical breakdown of the phthalate.
- Exposure to this compound has been studied to **trigger inflammation in the heart's arteries**, which, over time, is associated with increased risk of heart attack or stroke



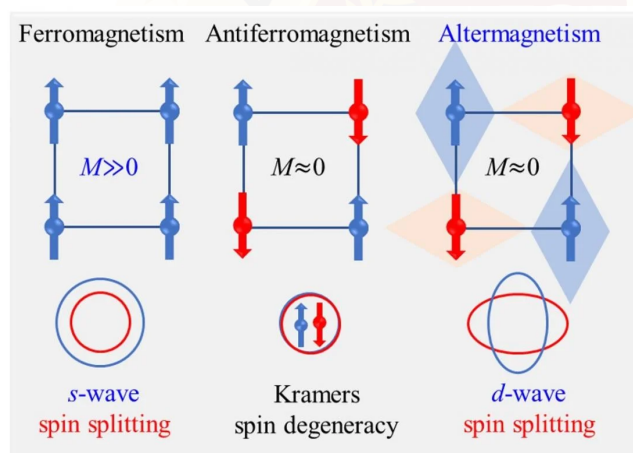
Room-Temperature Altermagnets

- Researchers at the Chinese Academy of Sciences recently uncovered a new material that exhibits **Altermagnetism at room temperature**, namely **KV₂Se₂O**.
- Altermagnetism is a **new kind of magnetism** — a mix of two known types:

➤ **Ferromagnetism:** Like in iron, nickel or cobalt — the tiny magnetic moments (or “spins”) of atoms align in the same direction, creating a strong **net magnetic field**.

➤ **Antiferromagnetism:** Spins point in **opposite** directions and cancel each other out, so no magnetism is felt outside. For every spin pointing up, there is one pointing down next to it. Examples are oxides of manganese, iron or nickel.

- **Altermagnets** have spins arranged in a pattern where they alternate in a special way, creating **some magnetic effects** but **no overall magnetism outside**.
- They combine the best of both worlds: they behave like magnets but don't create stray magnetic fields.
- This makes them great for future tech like **super-fast computers** and **tiny electronic devices** without disturbing nearby electronics.
- Unlike traditional magnets, altermagnets allow **ultra-fast spin dynamics**, meaning they can operate at **terahertz frequencies**—a million times faster than today's computer memory.



Hoyle–Narlikar Theory of Gravity

- Eminent Indian astrophysicist, and Padma Vibhushan awardee Jayant Narlikar, known for propounding **Conformal gravity with Fred Hoyle**, passed away recently.
- **Conformal gravity**, also known as the Hoyle–Narlikar theory of gravity, sought to improve on Albert Einstein's **General Theory of Relativity**, published in 1915.
- General Theory of Relativity describes **gravity not as a force, but as the curvature** of space-time caused by mass and energy.

- The more massive an object (like the Sun), the more it bends space-time, influencing how objects move.

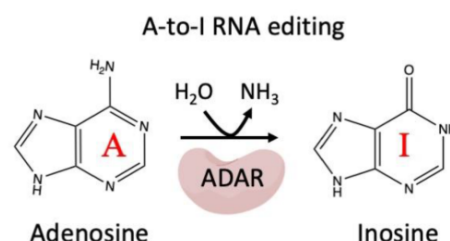
- At the heart of the Hoyle–Narlikar theory of gravity is **Mach's principle**, which says that the **mass of every object** in the universe is **affected by its interaction with every other object**.
- Hoyle and Narlikar said that the inertia of an object, that is the tendency to resist change in its state of motion, arises from its interaction with all other matter in the universe.
- According to them, a universe with nothing in it is impossible and there must be at least two particles, each to give mass to the other.
- The masses, and therefore the gravity, of the **sun and the earth are partly due to each other**, partly to more distant objects such as the stars and galaxies
- The Hoyle–Narlikar theory also proposed a **“creation field” (C-field)**, a hypothetical negative-energy field responsible for the continuous creation of matter.
- This helped explain the **steady-state cosmology**, which said that the universe had no beginning and will endure forever.

➤ The **steady-state concept** of the universe is essentially an alternative to **“Big-Bang” cosmology**, which proposed that the universe originated 13 billion years ago.

- The Hoyle–Narlikar theory of gravity was not widely accepted, especially after the discovery of the cosmic microwave background (CMB) radiation in 1965.

A-to-I mRNA Editing

- Recent studies have reignited interest in **A-to-I mRNA editing**, involving the **conversion of adenosine (A) to inosine (I)** in mRNA.
- **A-to-I mRNA editing** is a process that changes the genetic message **after** it is copied from DNA to RNA (post-transcription), but **before** it's used to make proteins.



Working mechanism

1. **mRNA** is the messenger molecule that carries instructions from DNA to the protein-making machinery in cells called **ribosomes**.
 2. Normally, the **mRNA** has four building blocks: A (adenosine), U (uracil), C (cytosine), and G (guanine).
 3. In **A-to-I editing**, special enzymes called **ADARs** (Adenosine Deaminases Acting on RNA) **change some adenosine (A) into inosine (I)**.
 4. The ribosome (which reads the mRNA to make proteins) treats **inosine as if it were guanine (G)**.
 5. This means the **protein made can be different** than what was originally coded by the DNA.
- This technology shows **potential applications** in cancer treatment, precision medicine, Anti-viral replication and even agriculture.

AI Hallucinations

- **OpenAI** (the company that released ChatGPT) recently found that its latest models — **o3 and o4-mini** — generate more errors than its older models.
- Such **instances** where artificial intelligence models (like ChatGPT) generate information that is false, incorrect, or fabricated, but presented confidently as if true is called **AI hallucinations**.
 - These are errors where the AI “hallucinates” facts, details, or answers that don’t exist or are misleading.
- ChatGPT, o3, o4-mini, Gemini, Perplexity, Grok and many more are all examples of what are known as **large language models (LLMs)**.
- These models essentially **take in text inputs and generate synthesised outputs** in the form of text.
- LLMs are able to do this as they are built using massive amounts of digital text taken from the Internet.
- LLMs are always making a guess while giving an output and they **do not know for sure what is true and what is not**.
- As a result LLMs may provide inaccurate text, and they may give inaccurate outputs, thereby hallucinating.

Tianwen-2 Asteroid Mission

- China recently launched its first mission, **Tianwen-2**, to survey and sample a near-Earth asteroid.
- The probe will investigate an asteroid called **469219 Kamoʻoalewa**, which orbits the Sun at a distance relatively close to Earth. It measures just 40 to 100 metres in diameter.
- If successful, China will join the US and Japan in returning asteroid samples.
- Kamoʻoalewa was discovered in 2016 by the **Pan-STARRS 1 asteroid survey telescope** on Haleakalā in Hawaii.
- It is one of just seven asteroids that fall into a little-understood class known as **quasi-satellites of Earth**.
 - These are satellites that orbit the Sun, but because of their close distance to Earth, they are gravitationally influenced by the planet.
- To collect the samples, the Tianwen-2 mission will use a **“touch-and-go”** technique where the spacecraft **hovers close to the surface** of the asteroid while a robotic arm **fires an object or burst of gas to knock fragments** into a collection chamber.
- Depending on the surface conditions, the Tianwen-2 probe might also use a second **“anchor and attach”** technique.
 - In this, four robotic arms extend and drill into the surface to retrieve material.

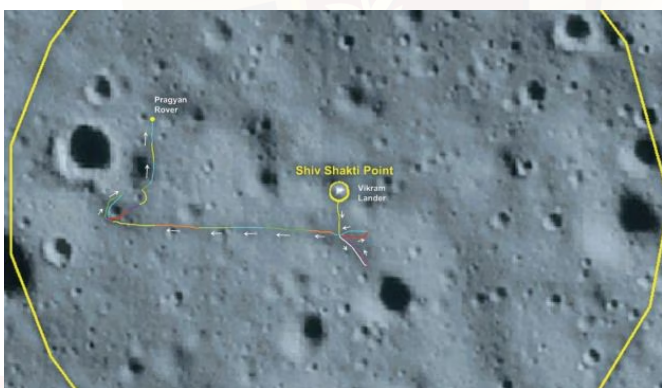
Intercrystals

- Researchers have discovered a **new class of materials called Intercrystals** which has unique electronic properties that could power future technologies.
- Intercrystals exhibit a **hybrid** of crystalline and quasicrystalline properties.
- They are formed by **stacking ultrathin atomic layers**, like twisted graphene on hexagonal boron nitride, at slight angles, creating a **“moiré” pattern** that significantly alters electron behavior.
- This misalignment of layers induces **unique quantum phases** not found in regular crystals, opening new possibilities for electronics and quantum technologies

- This idea comes from a field called **twistronics**, where twisting layers of materials at precise angles can create new and unusual electronic behaviors.
- Intercrystals could help **develop advanced technologies** like super-efficient electronics, very sensitive sensors, and parts for quantum computers

Shiv Shakti point

- In a new finding, scientists of the Physical Research Laboratory (PRL), Ahmedabad have revealed that the **landing site (Shiv Shakti point) of the Chandrayaan-3 mission** is a promising site to access primitive mantle samples.
- The Shiv Shakti point is located at the **southern high-latitude highlands of the nearside of the Moon**.
- The scientists have analysed the **concentrations of volatile elements** measured at Shiv Shakti station near the **South Polar Region**, using the Alpha Particle X-ray Spectrometer (APXS) onboard the **Pragyan rover of the mission**.
- They compared metal remnants and elemental concentrations of **sulfur, potassium, sodium among others**.
- ➡ Sulfur, potassium and sodium can give insights into the mantle composition and chemistry.



Defence

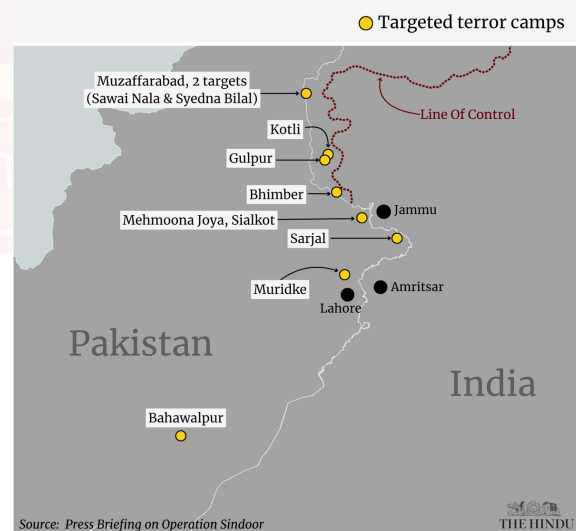
Operation Sindoor

- In response to the Pakistan-backed Pahalgam terror attack, India launched **Operation SINDOOR** to destroy the terror bases behind the attack.
- The purpose of the Operation was to **punish perpetrators** and planners of terror and destroy **terror infrastructure across the border**.
- The operation maintained strategic restraint while gaining international support.
- India's **non-kinetic efforts** included **termination of the Indus Waters Treaty**, with a decisive message: **"Blood and water cannot flow together."**
- India also suspended all bilateral trade and **closed the Attari-Wagah border** as well as closed its airspace to Pakistani flights through a **NOTAM**.

A NOTAM (Notice to Airmen) is an official alert issued to pilots and aviation personnel about important information that may affect flight safety or operations. It can include warnings about runway closures, airspace restrictions, navigation aid outages, weather hazards, or other temporary changes at airports or in the airspace.

Operation Sindoor

Indian armed forces on May 7, 2025, carried out missile strikes on nine terror targets in Pakistan and Pakistan-Occupied Jammu and Kashmir.



Source: Press Briefing on Operation Sindoor

THE HINDU

Akashteer

- **Pakistan's recent air borne attacks** on India's western border were successfully intercepted by **Akashteer, India's indigenous, fully automated air defence system**.
- It was developed jointly by the Defence Research and Development Organisation (**DRDO**), Indian Space Research Organisation (**ISRO**), and Bharat Electronics Limited (**BEL**).
- It integrates sensors from the Army Air Defence and Air Force to provide a **shared airspace picture**.
- It operates within the Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (**C4ISR**) framework and works with ISRO satellites and the Indian Regional Navigation Satellite System (**NAVIC**) for enhanced coordination.

Integrated Air Command and Control System (IACCS)

- The IACCS of the **Indian Air Force (IAF)** was instrumental in coordinating the defence network in the aftermath of Operation Sindoor.
- IACCS is an **automated Air Defense Command and Control center** for controlling and monitoring air operations.
- It integrates data from various air defence sources, including ground and airborne radars, civilian radar systems, and command centres.
- It provides **Recognised Air Situation Picture (RASP)**: It is an information that plays a critical role in the network-centric warfare era.
- The system provides real-time updates and a **consolidated dataset to commanders at strategic level (Air Headquarters)**, Operational level (Command Headquarters), and Tactical Level (Divisional level).

Military Exercise

Exercise	Participants	Place/Force	Remarks
Teesta Prahar	Indian Army	Teesta Field Firing Range in West Bengal	The participants included the Infantry, Artillery, Armoured Corps, Mechanised Infantry, Para Special Forces, Army Aviation, Engineers, and Signals .
Nomadic Elephant	India - Mongolia	It is a Joint Military Exercise held at Foreign Training Node, Umroi (Meghalaya)	It is the 16th edition of the Exercise

Indian military operations

Name	Force	Place	Remarks
Operation Black Forest	Central Reserve Police Force (CRPF) and Chhattisgarh Police	Kurraguttalu Hills on the Chhattisgarh-Telangana border	Anti-Naxal operation
Operation Shield	Civil Defence Exercise	Conducted across districts bordering Pakistan in these states and Union Territories	Mock drill
Operation Keller	Indian Army, CRPF, and J&K Police	Jammu and Kashmir's Shopian district	Counter-terrorism operation

Miscellaneous

Repairability Index Framework in Mobile Electronics Sector

- The **Bharat Khera committee** constituted by the **Department of Consumer Affairs (DoCA), Ministry of Consumer Affairs, Food & Public Distribution** in 2024 for developing the framework of the Repairability Index (RI) has recently submitted the report.
- The Repairability Index (RI) is designed to help consumers understand how easily a product—especially in the mobile and electronics sector—can be repaired.
- The committee recommends that the Repairability Index be displayed at the **point of sale/purchase**, e-commerce platforms, and as a QR code on packaged products, empowering consumers to make informed choices and reduce mindless consumption and wastage.
- **Original Equipment Manufacturers (OEMs)** will be required to self-declare the RI based on standard scoring criteria, without facing additional compliance burdens.
- The Repairability Index is assessed on **six core parameters**:

Components of Repairability Index



Biometric E-Passports

- India has officially entered the league of over 120 countries, including the United States, Canada, France, Japan, and Australia, by introducing **chip-enabled biometric e-passports**.
- An e-passport is a **conventional passport enhanced with electronic features**.

- It contains a built-in **RFID (Radio Frequency Identification)** chip and an antenna embedded in its cover.
- This chip securely holds the holder's **personal and biometric data**, including fingerprints and facial recognition details.
- Security protocols such as **basic access control (BAC)**, passive authentication (PA), and extended access control (EAC) are used to encrypt this sensitive data, ensuring global standards of protection.
- This allows for **contactless verification through automated e-gates** at immigration points.



This biometric symbol on the cover indicates that this is an e-Passport.

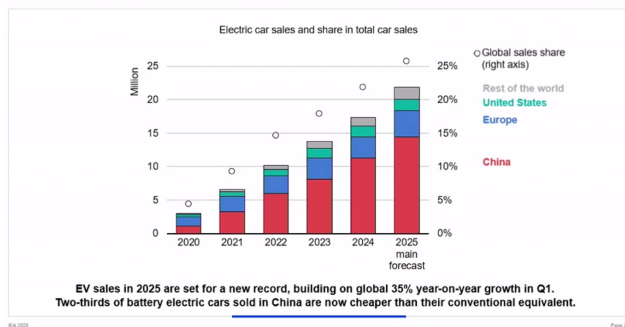


Global EV Outlook 2025

- Global EV Outlook 2025 is released annually by the **International Energy Agency (IEA)**.

Key Findings:

- **Global electric car sales** exceeded 17 million in 2024, with over 20% market share.
- **China led exports** with a 40% global share.
- Asia and Latin America saw over 60% growth, becoming new EV growth hubs.
- **India's EV sales** rose slightly to nearly 1 lakh (2% share), mostly driven by Tata.
- **Battery EV prices fell globally**, but remain 30% higher in the U.S., slowing growth.
- **Electric trucks grew 80%**, nearing 2% of global truck sales.
- 2025 forecast: Over 20 million EVs sold globally, exceeding 25% share.
- By 2030, EVs may reach 40% of all car sales under current policies.



Indore: First Beggar-Free City

- Indore has officially become India's first city without beggars as per the city administration.
- Last year there were around **5,000 beggars roaming the streets** of the city.
- Steps taken include **awareness campaigns, rehabilitation of beggars**, & a reward of Rs 1,000 is given to anyone providing information about begging among others.

Anti Begging Laws in India:

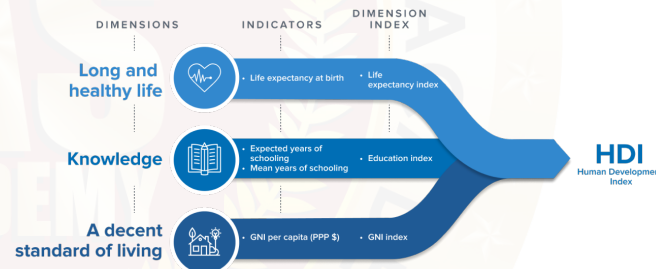
- Constitutional Safeguard:** The right to a **life free of exploitation** is guaranteed by **Article 23** which eliminates begging and other types of human trafficking.
 - Article 23 should be interpreted in conjunction with paragraphs **39(e)** and **39(f)**, which require the **state to safeguard people against exploitation** and moral and material abandonment.
- Parliamentary Laws:** Section 363A of the Indian Penal Code (IPC), 1860 (**Section 139** of the Bharatiya Nyay Sanhita (BNS)) makes it a **crime to kidnap or maim a minor** for the purpose of begging.
- Section 268** of the IPC (Section 270 of BNS), which deals with **public nuisance**, states that a person is guilty of a public nuisance if he or she causes injury, danger, or irritation to the public.
- Section 76** of the Juvenile Justice (Care and Protection of Children) Act, 2015: It is a crime to **employ or use a child for the purpose of begging**, or to induce a child to beg.
- State laws:** **22 states and union territories in India** have anti-begging laws, and the **Bombay Prevention of Begging Act, 1959** serves as the model for most of these laws.

Human Development Report 2025

- India rose in the Human Development Index (HDI), ranking **130 out of 193 countries** in the 2025 Human Development Report (HDR) released today by the **United Nations Development Programme**.
- The 2025 HDR title: **"A Matter of Choice: People and Possibilities in the Age of AI"**.

Key Findings:

- With an HDI value increasing from **0.676 in 2022 to 0.685 in 2023**, India remains in the **medium human development category**, moving closer to the threshold for high human development (**HDI \geq 0.700**).
- Life expectancy:** rose from 58.6 years in 1990 to 72 years in 2023.
- Schooling:** Children today are expected to **stay in school for 13 years on average**, up from 8.2 years in 1990.
- Gross National Income per capita:** rose over **four times**, from \$2167.22 (1990) to \$9046.76 (2023) based on 2021 PPP \$.
- Inequality:** reduces **India's HDI by 30.7%**, one of the highest losses in the region. While health and education inequality have improved, income and gender disparities remain significant.

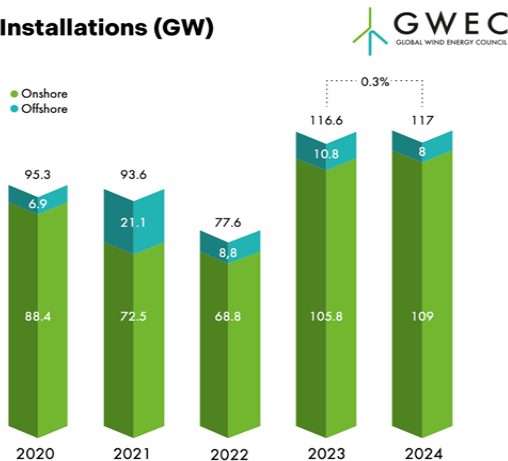


Global Wind Report

- The **Global Wind Energy Council's flagship Global Wind Report** released recently shows that 2024 was a record year for new capacity, with **117 GW of wind energy** installed across the world.
- China** came ahead of the **USA** in installations, followed by **Germany, India and Brazil** respectively making the top 5.
- The **Asia-Pacific region** saw a **7% year-on-year growth rate**, while Africa & Middle East saw a **107% y-o-y growth rate**, thanks to Egypt installing 794 MW and Saudi Arabia's 390 MW.

- **North America, Latin America and Europe experienced a decline** in new installations compared with 2023.
- The report forecasts a compound average growth rate of 8.8% for the wind industry, which means another 981 GW of wind energy capacity across the globe by 2030.

New Installations (GW)



Source: GWEC's Global Wind Report 2025
GWEC.net/gwr

Mizoram Achieves Full Functional Literacy

- Mizoram was recently declared the **first state** in India to achieve **full functional literacy**.
- This comes nearly 34 years after Kerala was declared a **"fully literate"** state in 1991.
- According to the 2011 census, Kerala was the most literate state in India (93.91%), followed by Lakshadweep (92.28%) and Mizoram (91.58%).
- **The National Literacy Mission (NLM), 1988** defines **full literacy as a minimum of 90%** literacy of its population having attained self-sufficiency in reading, writing, and basic arithmetic.
- Kerala's declaration of full literacy in 1991 was based on these NLM parameters.
- The Ministry of Education (MoE) under the **New India Literacy Programme (NILP)** defines **full literacy** (to be considered equivalent to 100% literacy) **will be achieving 95% literacy** in a State/UT that may be considered as equivalent to fully literate.
- ➡ Mizoram falls in this category.
- **Note:** In June 2024, Ladakh became the first fully literate administrative unit.

New India Literacy Programme (NILP)

- It is a **Centrally Sponsored Scheme** with an implementation period of five years from the FYs 2022-23 to 2026-27.
- The scheme aims to cover a target of **5 crore non-literates** in the age group of 15 years and above.
- The Scheme has five components: (i) Foundational Literacy and Numeracy, (ii) Critical Life Skills, (iii) Vocational Skills Development, (iv) Basic Education and (v) Continuing Education.

Globally Important Agricultural Heritage Systems

- 6 new sites of traditional agroforestry systems have recently become new additions to the **Globally Important Agricultural Heritage Systems (GIAHS)**.
- **Erva-mate plant in Brazil**, three sites in **China** specializing in pearl mussels, white tea and pears, an ancestral system preserving vital food crops and **biodiversity in Mexico** and a distinctive farming system in the **volcanic landscape of Spain's Lanzarote island** became the latest additions.
- The GIAHS programme of the **Food and Agricultural Organisation (FAO)** aims to **identify, support and safeguard agricultural systems** that sustain and conserve our biodiversity and genetic resources for food and agriculture, rural livelihoods, knowledge systems, cultures and remarkable landscapes.
- Since 2005, FAO has designated 95 systems in 28 countries as agricultural heritage sites.
- **Indian sites:** Koraput Traditional Agriculture of Orissa, Kuttanad Wetland Agriculture System of Kerala & Pampore Saffron Heritage in Jammu & Kashmir



Vizhinjam International Seaport



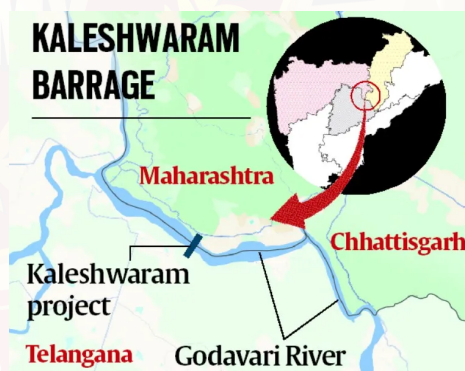
- The newly built **all-weather Vizhinjam International Seaport**, was dedicated to the nation by Prime Minister Narendra Modi recently.
- This **first semi-automated port** in the country is intended primarily to bring home the Indian cargo transshipment presently being undertaken at the foreign ports of **Singapore, Colombo, Salalah and Dubai**.
- The Vizhinjam port also features remote-controlled quay cranes, and India's first AI-powered Vessel Traffic Management System.
- It is strategically located just **10 nautical miles** from the busy **international shipping route** connecting Europe, the Persian Gulf and the Far East.
- It is a natural port with a deep draft of **18m close to shore** that requires no capital dredging.
- Its curvilinear coast **mitigates tsunami impact** while the port's positioning results in only mild erosion, minimizing maintenance costs.

Palamu Tiger Reserve



- The relocation of **Jaigir village from the core area** marks a milestone in conservation efforts at Palamu Tiger Reserve (PTR), Jharkhand.
- The Reserve is located in the western side of Latehar district on the **Chhotanagpur plateau** in Jharkhand.
- The project area is constituted mainly of **Sal forests**, mixed deciduous forests and bamboo groves.
- The reserve zone is the watershed area for 3 important rivers **Koel, Burha and Auranga**.
- The PTR was constituted in the year **1974 under Project Tiger** and is one of the first 9 tiger reserves created in the country at inception of 'Project Tiger'.
- Palamau Tiger Reserve has the distinction of being the **first sanctuary in the world in which a tiger census was carried out as a pugmark count**, as early as 1932.

The Kaleshwaram Lift Irrigation Project (KLIP)



- The **National Dam Safety Authority (NDSA)** has found "irreparable damage" in the structure of three barrages that are part of the **world's biggest multi-stage lift irrigation** project, KLIP.
- The Kaleshwaram Lift Irrigation Project (KLIP) falls on the **Godavari** river in Telangana's Jayashankar Bhupalpally district.

- It is close to the **Maharashtra border** and will supply water for irrigation, industrial, and domestic uses over a swath of **northern Telangana**.
- The project sprawls over **approximately 500 km in 13 districts**, with a canal network of 1,800 km.
- **Note:** The National Dam Safety Authority (NDSA) is a statutory body set up under the National Dam Safety Act, 2021.

Uturuncu Volcano



- Recent studies reveal that Uturuncu Volcano in Bolivia is linked to the movement of magma and gases beneath the surface.
- Uturuncu hasn't erupted for more than 250,000 years, but it shows signs of activity similar to those seen in active volcanoes, such as **gas plumes and earthquakes**.
- It is the tallest mountain in Bolivia and part of the **Central Andes mountain range** and is known as a "**zombie volcano**" - thought to be dormant or extinct but shows signs of renewed activity
- Beneath Uturuncu at a depth of about 10 to 20 kilometers lies a vast reservoir of magma called the **Altiplano-Puna Magma Body**.
- Spanning roughly 200 kilometers, it is the biggest known active magma body in the planet's crust.

India's First AI Special Economic Zone



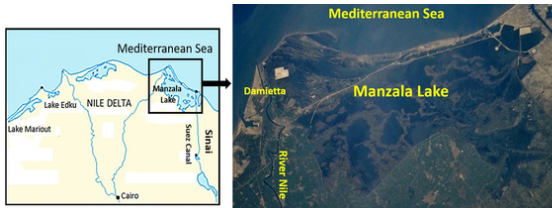
- India's **first artificial intelligence-focused special economic zone (SEZ)** is set to come up in **Chhattisgarh's capital city Nava Raipur**.
- The project comes with a substantial **investment of Rs 10 billion from Indore-based RackBank Datacenters**, a company known for its carbon-neutral data centres.
- Spanning six acres, this SEZ will house a **1.5 lakh square foot facility featuring high-performance servers** and infrastructure capable of supporting AI research, development, and deployment.
- **Nava Raipur**, officially known as **Atal Nagar-Nava Raipur**, is a planned and fully Greenfield city in the Indian state of Chhattisgarh.
- It is planned to **replace Raipur as the capital city** of Chhattisgarh.
- The city is located between **National Highway 53 and National Highway 30**, about 17 km south-east of the capital city Raipur.
- Swami Vivekananda Airport separates Raipur and Nava Raipur.

Chagos Islands



- Recently, the United Kingdom and Mauritius signed an agreement by which the United Kingdom has agreed to **cede the control of Chagos Archipelago to Mauritius**.
- However, the United Kingdom and the United States will keep the **Diego Garcia Airbase**.
- The Chagos Archipelago, in the **Indian Ocean**, was earlier governed by the United Kingdom as the **British Indian Ocean Territory (BIOT)**.
- Chagos Island, which consists of more than 60 low-lying islands, is located in the **central Indian Ocean, south of the Maldives** and off India's southern coast.
- The Archipelago is a collection of **seven atolls made up of 58 separate tropical islands**.
- There haven't been any indigenous inhabitants, often referred to as **Chagossians or Ilois**, since Britain forcibly uprooted up to 2,000 people, mostly former agricultural labourers, from the islands in the late 1960s and early 1970s to **build the Diego Garcia base**.

Lake Manzala



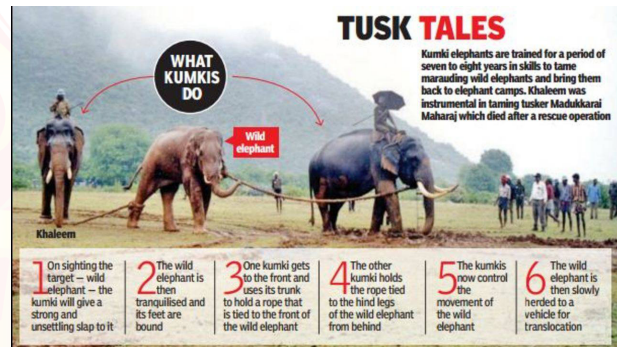
- According to a recent study, dredging increased salinity and reduced nutrients in Manzala lake considerably in 2022 compared to 2015 (before dredging).
- Manzala is situated in the **northern part of Egypt**, with the **Mediterranean Sea** to its north.
- It sustains biodiversity in the Mediterranean region and acts as a natural buffer zone between the saline water of the Mediterranean Sea and the agricultural fields.
- In 2021, Manzala contributed to Egypt's 16% natural fish production and 3.6% total fish production.
- Lake Manzala, also **Manzaleh**, is a **brackish lake**, in northeastern Egypt on the **Nile Delta** near **Port Said**.

Sagar Bhavan and Polar Bhavan

- The Government of India inaugurated “Sagar Bhavan” and “Polar Bhavan”, two first-of-its-kind facilities at **Goa's “National Centre of Polar and Ocean Research” (NCPOR)**.
- **Polar Bhavan**: The largest building at the NCPOR campus, spans 11,378 square metres and was constructed at a cost of ₹55 crore.
 - 🏠 It includes laboratories for **polar and ocean research**, and houses the “**Science On Sphere (SOS)**” initiative and will eventually serve as the home of **India's first Polar and Ocean Museum**.
- “**Science On Sphere (SOS)**” initiative is a 3D visualization platform for displaying earth systems and climate-related data.
- **Sagar Bhavan**: It includes two **-30°C ice core laboratories** and **+4°C storage units** for archiving sediment and biological samples.

Species in News

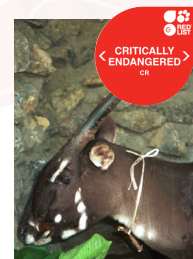
Kumki Elephants



- The Karnataka government recently handed over four trained kumki elephants to neighboring Andhra Pradesh.
- **Kumki (Persian for aid or helper)** elephants are captive Asian elephants meticulously trained to perform specialised tasks in wildlife conservation.
- Unlike ordinary working elephants, they are **conditioned to remain calm in volatile situations**, responding solely to their mahouts' commands.
- Their primary roles **include driving wild elephants away from villages**, aiding in rescue operations, and even helping tame newly captured elephants.
- After wild elephants are captured (**often in a kraal, a temporary enclosure**), Kumkis help in their training by walking alongside them and correcting aggressive behavior.
- They also assist in **rescuing elephants stuck in wells, mud**, or other dangerous situations.

Saola

- An international team of scientists has mapped the **genome of the saola (Pseudoryx nghetinhensis)**, the rarest large land mammal in the world.

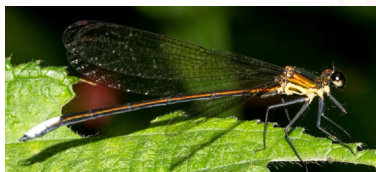


- The saola, also known as the **Asian unicorn**, is critically endangered with fewer than 100 individuals estimated to remain in the wild.

- The saola is a large mammal in the **Bovidae family known for its unusual horns.**
- They have only been found in the **Annamite Mountains on the border of Vietnam and Laos.**
- There are no saola in captivity and the last categorically documented **saola sighting was in 2013.**

Caliphaea sinuofurcata

- Scientists have identified a new species of damselfly, **Caliphaea sinuofurcata**, from Arunachal Pradesh.
- The species, commonly named the “**Bearded Bronzeback,**” was described based on two male and one female specimens collected from the **Upper Siang and Lower Dibang Valley districts.**
- This discovery marks only the second species of the **genus Caliphaea** recorded in India, following **C. confusa**, described over **165 years ago.**
- The new species is distinguished by the **unique shape of its paraproct and genital ligula.**



New Cave-Dwelling Fish Species



- A team of zoologists have recorded **Schistura densiclava**, a new species of troglophile loach from **Krem Mawjymbuin, a cave** in the East Khasi Hills district of Meghalaya.
- **A troglophile animal is essentially a cave-dwelling animal** that can thrive and reproduce in epigeal, or aboveground, environments.
- **Krem means cave** in the indigenous Khasi language.

- The newly described **loach, a bottom-dwelling fish** with barbels hanging from the mouth, was found in a cool, fast-flowing stream about 60 meters inside the cave, where the temperature was 18°C and oxygen levels were low.
- Belonging to the **Nemacheilidae family**, *Schistura densiclava* is **adapted to the dark, subterranean environment** but can also survive in surface waters.

Mosura Fentoni



- Scientists have uncovered a strange **new Late Cambrian era sea predator called Mosura fentoni** in Canada's famous **Burgess shale**, that lived **506 million years ago.**
- *M. fentoni*, a newly found 3-eyed **radiodont**, a distant relative of insects, crabs, and spiders, showed **advanced swimming and breathing traits** despite its small size (1.5–6 cm).
- Its 26-segment body is divided into:
 - A **short neck**,
 - A **mesotrunk** with 6 paddle flaps for swimming,
 - A **posterotrunk** with up to 16 gill-packed segments for breathing.
- Mosura likely **swam like a stingray**, using flaps to glide underwater.

Niallia Tiangongensis

- Chinese scientists have discovered a new species of bacteria on board the **Tiangong Space Station** named **Niallia tiangongensis.**
- The new microbe has been described as an **aerobic, spore-forming and rod-shaped bacterium.**

- The novel strain closely resembles **Niallia circulans** found on Earth, but it also exhibits several mutations that could prove beneficial in the study of life as it moves out into space.
- The new bacteria has a “**unique ability**” to **hydrolyse (break down) gelatine**, which could be useful in environments with limited nutrients.
- It is yet to be determined whether the new bacteria poses any threat to the health of Tiangong’s astronauts

Dugong



- May 28 is celebrated every year as **World Dugong Day**.
- Dugongs (*Dugong dugon*), also called **sea cows**, are the only herbivorous marine mammals in India.
- Found in **shallow Indo-Pacific waters**, especially Andaman & Nicobar, Gulf of Mannar, Palk Bay, and Gulf of Kutch.
- They feed on **seagrasses** like *Cymodocea*, *Halophila*, *Thalassia*, and *Halodule*, consuming 20–30 tonnes daily due to low nutrient content.
- Dugongs are **solitary** or in **mother-calf pairs**, live up to 70 years, and mature at 9–10 years.
- With **slow reproduction** (1 calf every 3–5 years), their population grows at only ~5% per year.

Shirui Lily



- The **Shirui Lily festival** returns to Manipur after a two-year pause because of the long-drawn conflict in the state.
- The Festival is organised by the **Manipur government’s Department of Tourism**.
- First held in 2017, it is one of **two major tourism festivals** organised by the state government.
- While it is named after the **Shirui Lily, or the Lilium mackliniae, recognised as the state flower of Manipur**, the other major festival is named after the **Sangai, or the Manipur brow-antlered deer**, recognised as its state animal.
- The Lily is **endemic to the upper reaches of the Shirui Hill** range in Ukhrul district at an elevation of 2,673 m above sea level.
- Locals had long been familiar with the plant, calling it the ‘**Kashong Timrawon**’ after Timrawon, the daughter of **mythical goddess Philava** who resides and protects the hills of Shirui.

Narayanpatna Goat



- The Narayanpatna goat, native to **Odisha’s Eastern Ghats**, faces threats due to unscientific crossbreeding and lack of breed recognition.
- The Narayanpatna goat is a **non-descriptive Indian native goat breed**, predominantly found in the hilly landscape of Narayanpatna and Bandhugaon blocks of Southern Odisha’s Koraput district.
- This resilient, adaptable goat population has been a lifeline for tribal communities such as the **Kondh and Paroja**.
- The goat’s resilience **to survive on sparse vegetation and limited water** sources makes it well-suited for the marginal lands and subsistence economy of the region.
- **Endo and ecto-parasitic infestations are minimal** compared to other exotic or crossbred goats, reducing dependency on veterinary interventions.

Keywords

1. **e-Zero FIR Initiative:** is a technology-based platform that enables the **automated registration of Zero FIRs** for value cyber financial crimes. Led by the **Indian Cybercrime Coordination Centre (I4C), Ministry of Home Affairs**, the programme is now piloted in Delhi. Complaints of financial frauds worth **more than ₹10 lakh**, reported through the **National Cybercrime Reporting Portal (NCRP)** or helpline number 1930, will be automatically turned into e-Zero FIRs under this scheme.
2. **Agent Orange:** It was a powerful herbicide and defoliant chemical used by the United States military during the **Vietnam War (1961–1971)** as part of its herbicidal warfare program, **Operation Ranch Hand**. It is a chemical **mixture of two herbicides**, 2,4-D and 2,4,5-T, the latter of which was contaminated with dioxin (TCDD), a highly toxic compound.
3. **Stromatolites:** They are **layered sedimentary rocks** formed from the entrapment of calcium carbonate precipitates by photosynthetic microorganisms such as cyanobacteria, sulfate-reducing bacteria, and Pseudomonadota (formerly proteobacteria), in shallow marine or freshwater environments. These bacteria **build up layers by trapping and binding sediment** with their sticky secretions, and over time, these layers harden into rock. They are considered the oldest known fossilized evidence of life on Earth, dating back **over 3 billion years**.
4. **Nurdles:** They are **small plastic pellets (1–5 mm)** used as raw material in plastic production. Often called “**mermaids’ tears**,” they are primary **microplastics**. Common types include **Low-Density Polyethylene (LDPE)** (used in plastic bags/films) and **HDPE** (used in containers, bottles, pipes, etc.). Recently, nurdles washed ashore on Kerala’s coast after a Liberian-flagged ship sank near Kochi.
5. **Red Teaming:** involves embedding a small group of experts familiar with the adversary’s mindset, tactics and response patterns into the planning process. Their role is to **critically challenge the plan, simulate enemy reactions**, and help test the robustness of the intended military strategy. For the first time the Indian military has tested this concept in an actual operation - Op Sindoor.
6. **Druze community:** are an ethnoreligious minority that largely identifies as Arab and is Arabic-speaking. They are found in Syria, Lebanon, Jordan, Israel and the **Golan Heights** – Syrian territory occupied by Israel. The Druze religion grew out of **Ismaili Shia Islam in the 11th century** but has evolved to include aspects of other religions, **including Hinduism, as well as ancient philosophies**. Druze have fought for Israel in its wars against Arab neighbours and the Palestinians.
7. **The One Big Beautiful Bill Act of 2025 (OBBBA):** The OBBB Act essentially encapsulates **Trump’s policy agenda and campaign promises** in ‘one big, beautiful’ legislative document. The Act makes the 2017 tax cuts permanent, boosts border security spending, imposes work requirements on Medicaid and rolls back clean energy tax credits.
8. **Bow Echo:** It is a **radar signature** of a curved line of thunderstorms, recently detected in Delhi weather radars, shaped like an archer’s bow **due to strong straight-line winds pushing the storm’s center forward**. It is often associated with damaging winds, brief tornadoes, heavy rain, and sometimes hail. Bow echoes typically last a few hours and can span over 100–300 km. A larger, longer-lasting version is called a derecho.
9. **Lonza Valley:** Loetschental (Lonza) Valley is located in the **canton of Valais**, in southern Switzerland, within the Alpine region. **River Lonza** flows through the valley, fed by Alpine glaciers. The valley is part of a **fragile high-altitude ecosystem** highly sensitive to global warming. On May 28, the collapse of a massive Birch Glacier here buried the village of Blatten underneath it.
10. **Gene-Edited Sheep:** Sher-e-Kashmir University of Agricultural Sciences and Technology (SKUAST-Kashmir) has successfully produced India’s first gene-edited sheep using the CRISPR-Cas9 technology. The gene-edited lamb has been modified for the ‘**myostatin**’ gene – **a regulator of muscle growth**. **Muscle mass** in the animal is **enhanced by nearly 30%** by disrupting the gene.



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NADIYA ABDUL RASHEED
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IMP



ADARSH C S
AIR 457
IMP



ANAND PYARELAL
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MTS, IMP



GREESHMA K B
AIR 559
IMP



OORMILA J S
AIR 563
PCM, Sociology



HEMA V
AIR 569
MTS, Sociology, IMP



AKSHAY RAJ P
AIR 641
MTS, IMP



VAISAKH C R
AIR 656
IMP



ANJALI P
AIR 702
PCM, Malayalam
Optional



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IMP



AJAY R RAJ
AIR 730
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PCM



PRANAV P MANANGATH
AIR 800
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