

DAILY CURRENT AFFAIRS (DCA)

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STEM BRAIN DRAIN IN INDIA: BEYOND INCENTIVES, TOWARDS ECOSYSTEM

Context

- India has long faced the challenge of brain drain in STEM migration abroad for better research opportunities, which has led to a **gap between India's intellectual potential and the resources available domestically**.

Brain Drain in India

- Brain Drain** refers to the emigration of highly skilled and educated individuals from one country to another, usually in search of better opportunities.
- In India** engineers, doctors, scientists, IT professionals, and academics move to developed countries like the USA, UK, Canada, and Australia.
- Between 2015 and 2022**, 1.3 million Indians left the country, many of whom were highly educated professionals.
 - In 2022 alone, 225,000 Indians renounced their citizenship, the highest number recorded.
- Top Destinations:** The United States, Canada, and Europe remain top destinations for these skilled workers.

Reasons for Brain Drain from India

- Economic Factors:** Lower salaries compared to developed countries.
 - Limited job opportunities for highly specialized skills.
- Educational and Professional Opportunities:** Limited access to world-class research infrastructure.
 - Better training, exposure, and career growth opportunities abroad.
 - Preference for global higher education for advanced degrees.
- Lifestyle and Quality of Life:** Better healthcare, infrastructure, and living standards abroad.
 - Global recognition and networking opportunities.
- Inadequate Research Funding and Infrastructure:** India's expenditure on Research and Development stands at just 0.64% of GDP as of 2020-21, significantly lower than the global average of 1.79%.

Concerns

- Loss of Skilled Human Capital:** India invests heavily in education and training, especially in fields like IT, medicine, and engineering.

- When highly skilled professionals emigrate, the country loses critical talent needed for innovation and economic growth.
- Slower Economic Development:** Skilled professionals are key to entrepreneurship, research, and technological advancement.
 - Brain drain reduces domestic productivity and slows the development of high-tech industries and start-ups.
- Impact on Health and Education Sectors:** India faces shortages of doctors, nurses, and educators due to migration to countries with better pay and working conditions.
- Reduced Global Competitiveness:** A consistent outflow of talent can make India less competitive in knowledge-intensive sectors.
 - Other countries benefit from India's investment in human capital without sharing the costs.

Government Initiatives

- Prime Minister's Research Fellowship (PMRF):** Launched in 2018, PMRF aims to retain top research talent by offering monthly stipends of 70,000-80,000 and research grants up to 2 lakh per year.
- Medical Education Expansion:** Medical colleges doubled to 808 in 2025-26 from 387 in 2013-14, with undergraduate seats up 141% and postgraduate seats up 144%.
- VAJRA (Visiting Advanced Joint Research) Scheme:** Invites overseas scientists and experts to collaborate with Indian institutions.
- Anusandhan National Research Foundation (ANRF):** Established to enhance R&D investment and strengthen the innovation ecosystem, with the Union Budget 2024 creating a 20,000-crore corpus for private sector R&D.
- National Institutional Ranking Framework (NIRF):** Encourages universities to improve research and academic standards.
- Ramanujan Fellowship & INSPIRE Faculty Scheme:** Attracts young Indian scientists back to India after overseas experience.

Way Ahead

- Trigger for Repatriation Efforts:** Policies abroad, such as the US visa and academic restrictions, have created an opportunity for India to attract its diaspora back.
- Investments like Google's \$15 billion AI hub in Andhra Pradesh** reflect collaboration opportunities for returning talent.

- **Education and Research Funding:** India spends 3-4% of its GDP on education, below the global average of 4.9%. Increasing this to 5% would help bridge the gap.
- **Increase R&D Spending:** India must significantly boost R&D expenditure from the current 0.64% to at least 2% of GDP to match global standards.
 - ♦ Private sector participation needs to increase as seen in developed economies.
- **Freedom & Academic Openness:** Academic freedom is essential for long-term retention and innovation.
 - ♦ Incidents of scholar deportations and restrictions send discouraging signals to potential returnees.

Conclusion

- Repatriating talent is just the first step; India must create an ecosystem where brilliance can thrive—through robust institutions, academic autonomy, funding, and openness to challenging questions.

Source: IE

GOVT. NOTIFIES AMENDMENTS TO IT RULES, 2021 TO REGULATE AI-GENERATED CONTENT

Context

- The Ministry of Electronics and Information Technology (MeitY) has proposed amendments to the Information Technology (Intermediary Guidelines and Digital Media Ethics Code) Rules, 2021 under powers granted by the Information Technology Act, 2000.

About

- A new amendment to the IT Rules, 2021 aimed at:
 - ♦ Strengthening online content regulation and transparency in takedown procedures;
 - ♦ Tackling AI-generated and synthetic media (deepfakes); and
 - ♦ Ensuring that government orders for content moderation are lawful, proportionate, and accountable.

Key Proposed Amendments

- **Authorized Officers for Content Regulation:** Only Joint Secretary-rank officers (or equivalent in Central Government) and Director General of Police-rank officers (for states) can issue takedown requests.

- ♦ This would prevent misuse of lower-level bureaucratic orders and ensure accountability.
- **Legal Justification:** Every takedown order must clearly cite:
 - ♦ Statutory basis (specific provision under IT Act or related laws);
 - ♦ Precise URLs, posts, or content identifiers; and
 - ♦ Reasons for removal in writing.
- **Review Mechanism:** All takedown actions will undergo a monthly review by a Secretary-level officer to ensure legality, necessity, and proportionality.
 - ♦ This will enhance transparency and reduce arbitrary censorship.
- **Regulation of AI-Generated Content:** Introduces definition of “synthetically generated information” — any content (image, video, or audio) created or modified algorithmically to appear authentic.
 - ♦ Establishes legal clarity on what constitutes AI-manipulated media.
- **Labelling of Deepfakes:** Platforms must embed visible labels or metadata on AI-generated visuals and audios, covering at least 10% of the frame area or duration.
- **Platform Accountability:** Significant Social Media Intermediaries (SSMIs) — such as Facebook, Instagram, X, and YouTube — must:
 - ♦ Obtain user declaration while uploading potentially AI-altered content.
 - ♦ Use automated detection tools to identify and tag deepfakes or synthetic media.
- **Due Diligence Obligations:** Non-compliance with these norms will lead to loss of “safe harbour” protection under Section 79 of the IT Act, 2000.
 - ♦ Platforms can be held legally liable for unlawful or misleading content hosted.

Significance

- Strengthens India's digital governance framework and online safety ecosystem.
- Aligns with the government's focus on tackling AI misuse, fake news, and deepfake threats.
- Reinforces trust and transparency in the digital space.

Concerns

- Risk of censorship and overreach by government-appointed fact-check bodies.

- Ambiguity in defining “fake” or “misleading” content.
- Challenges for smaller platforms in complying with technological requirements.

Way Forward

- Need to ensure independent oversight in content moderation.
- Maintain a balance between freedom of speech and user protection.
- Encourage digital literacy and ethical AI use to complement regulatory measures.

Source: TH

CAN MATCH-FIXING BE LEGALLY CONSIDERED CHEATING?

Context

- The Board of Control for Cricket in India (BCCI) approached the Supreme Court seeking to **intervene in a criminal appeal related to alleged match-fixing in the Karnataka Premier League (KPL) in 2018-19.**

About

- The Karnataka High Court quashed the criminal proceedings, holding that while match-fixing was reprehensible, it **did not amount to the offence of cheating as defined by Section 420 IPC.**
- **BCCI argues** that match-fixing should be viewed as cheating as there is an implied promise to spectators/sponsors that the match will be played fairly.
 - ♦ When players fix outcomes, they deceive the public and breach that promise — satisfying the elements of Section 420.
 - ♦ BCCI has framed **its own anti-corruption code for cricketers**, but stated that criminal prosecution is also necessary.

Section 420 IPC

- To convict someone under Section 420 of the IPC (cheating), the prosecution must prove that:
 - ♦ The accused deceived someone.
 - ♦ The deception was done dishonestly.
 - ♦ The deception induced the person to either: Give up property or money, or Do something they wouldn't normally do, based on that deception.
 - ♦ Because of this deception, the victim suffered a loss or was cheated.

- The Karnataka High Court held that in match-fixing cases, **spectators choose to buy tickets on their own**, even if they expect a fair game.
 - ♦ Since there is no evidence that they were deceived or tricked into buying tickets, the crime of cheating was not proven.

Match/Sport Fixing

- Match or Sport Fixing refers to the **manipulation of the outcome or specific events** in a sporting contest to achieve a predetermined result, often for financial gain.
 - ♦ It means **deliberately influencing a game's result** or certain actions to benefit a player, team, or gambler, rather than letting the game be decided by fair play.
- **Impact:** Undermines the integrity, fairness, and credibility of sports.

Laws Pertaining to Sport Fixing in India

- There is **no specific central legislation in India** criminalising match-fixing or sports fraud per se.
- Enforcement has relied on **general provisions of the IPC** but as the Karnataka HC decision shows, this is legally vulnerable.
- **The Law Commission of India in its 276th Report in 2018** had noted that the legal framework is inadequate, and recommended that match-fixing/sports fraud should be specifically made criminal offences with severe punishments.

Comparative Law Internationally

- **UK:** Under the Gambling Act 2005 it is offence to deceive or interfere in connection with the outcome of a game or event where a bet is placed.
- **Australia:** Various states have laws that criminalise conduct that corrupts the outcome of sport via betting.
- **South Africa:** The Prevention and Combating of Corrupt Activities Act (2004) covers corrupt activities relating to sporting events.

Implications of SC Ruling

- If the Supreme Court accepts BCCI's position, then match-fixing may be held to be a crime of cheating under IPC in India — even without a specific new statute.
 - ♦ This would enable **stronger criminal prosecution** of match-fixing rather than only internal disciplinary action by sports bodies.
- Conversely, if the court holds that the existing provisions are inadequate — **it may prompt legislative reform from Parliament.**

Source: IE

ATLAS: THE RISE OF AI-POWERED BROWSERS

In News

- OpenAI has launched its AI-powered browser Atlas, following Perplexity's release of Comet, marking a new phase in the generative AI competition.

Atlas

- It is an AI-integrated browser designed around ChatGPT, without a traditional address bar.
- It features an Agent Mode that autonomously conducts searches for users.
- It is Available in preview for Plus, Pro, and Business users.
- It follows Perplexity's launch of its AI browser Comet, signaling a direct challenge to Google Chrome.

Why AI Companies Are Building Browsers

- Browsers are the primary gateway to online activities—search, shopping, banking, entertainment, and more.
- Controlling the browser interface allows companies to own user intent and data.
- Monetise traffic, similar to Google's ad model.
- Integrate AI into familiar user experiences.
- Launching AI browsers helps bridge the gap between chatbot interfaces and traditional web search.

How AI Browsers Are Changing Search

- Traditional search engines return multiple links; AI browsers offer direct, concise, and personalised answers.
- They also suggest related prompts, encouraging deeper exploration.
- This marks a shift in how users interact with the web, potentially reducing reliance on link-based navigation.

Broader Implication

- The launch of AI browsers by OpenAI and Perplexity, combined with the rise of AI-generated search summaries, signals a paradigm shift in online discovery.
- As AI increasingly mediates how users access information, traditional web traffic models and publisher visibility are being disrupted—reshaping the future of search, content, and monetisation.

Source:IE

INDIA MOVES UP TO 9TH POSITION GLOBALLY IN FOREST AREA

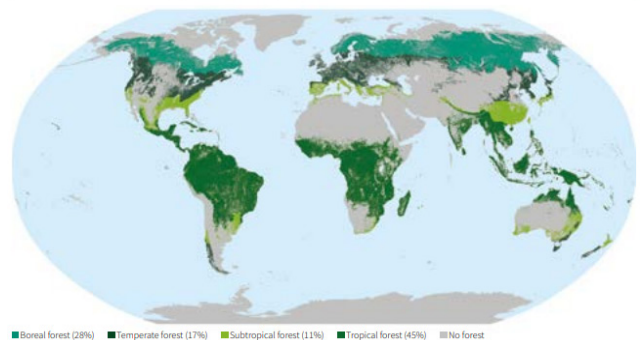
Context

- India has moved up to the **9th position** in terms of total forest area globally, as per the Global Forest Resources Assessment (GFRA) 2025, released by the **Food and Agriculture Organization (FAO)** in Bali.
 - The GFRA is published **every five years**.

Key Findings

- Globally, forests cover **4.14 billion hectares**, accounting for about **32%** of total land area, translating to **0.5 hectares of forest per person**.
- Russia** has the largest forest cover followed by **Brazil, Canada, the USA, China, Congo, Australia, Indonesia, India and Peru**.
- The report highlights that **global deforestation** has slowed in the past decade.
 - However the world continues to lose **10.9 million hectares** of forest every year (**2015–2025**), a rate still considered alarmingly high.
- India's Forest Cover Status:**
 - India's forest cover stands at **72.7 million hectares**, representing about **2%** of global forest area.
 - India has maintained its **third position** worldwide after **China and Russia** in terms of **annual forest gain**.
 - India and Indonesia** together represent over **70%** of global agroforestry areas, indicating strong integration of trees in farmlands.

Global distribution of forests, by climatic domain, 2025



Significance of India's Achievement

- Climate Change Mitigation:** Expanding forest area enhances carbon sequestration, aiding **India's Nationally Determined Contributions (NDCs)** under the Paris Agreement.
- Biodiversity Conservation:** Forests serve as habitats for a wide range of flora and fauna, supporting India's rich biodiversity.

- **Livelihood Support:** Over **275 million people** in India depend on forests for livelihood, making their sustainable management socio-economically crucial.
- **Land and Water Security:** Forests prevent soil erosion, regulate water cycles, and help maintain ecological balance in fragile ecosystems.
- **International Commitments:** Aligns with India's targets under the **UN Decade on Ecosystem Restoration (2021–2030)** and **SDG 15 (Life on Land)**.

Government Initiatives toward forest conservation

- The '**Ek Ped Maa Ke Naam**' campaign has been instrumental in encouraging citizens to plant trees and enhance environmental consciousness.
- **National Mission for a Green India (GIM):** A mission under the National Action Plan on Climate Change (NAPCC) that aims to increase forest cover and improve existing forest quality to combat climate change.
- **Compensatory Afforestation Fund Act (2016):** An act that ensures funds for afforestation and related activities by requiring users of forest land for non-forest purposes to pay compensatory levies.
- **Eco-Sensitive Zones (ESZs):** Areas designated around Protected Areas (National Parks and Wildlife Sanctuaries) to act as a buffer and minimize the negative impact of certain human activities on fragile ecosystems.
- **Joint Forest Management (JFM):** A program that fosters partnerships between state forest departments and local communities to protect, and regenerate forest resources.

What are the Challenges?

- **Development Projects:** Forest diversion for mining, roads, and urban expansion continues to threaten ecological stability.
- **Forest Degradation:** Over-extraction and encroachment affect forest health and connectivity.
- **Climate Extremes:** Rising temperatures and altered rainfall patterns affect forest regeneration and species composition.
- **Conservation and Livelihoods:** Ensuring local community welfare while maintaining conservation priorities remains a challenge.

Concluding remarks

- India's progress in global forest rankings reaffirms the country's commitment to environmental sustainability and green growth.

- Continued focus on scientific forest management, local participation, and climate-resilient ecosystem restoration will be essential to sustain and enhance this momentum in the years ahead.

Source: PIB

NEWS IN SHORT

ISRAEL'S PARLIAMENT GIVES INITIAL NOD TO OCCUPIED WEST BANK ANNEXATION

Context

- Israel's Parliament, the Knesset, has given preliminary approval to the bill titled "Application of Israeli Sovereignty in Judea and Samaria, 2025," aimed at applying Israeli law to the occupied West Bank.

About West bank

- The West Bank is a **landlocked territory in the Middle East** that is a central part of the Israeli-Palestinian conflict.
- It lies to the **west of the Jordan River** and is bordered by Israel to the west, north, and south, and by Jordan and the **Dead Sea** to the east.



History and political status

- **British Mandate:** From 1920 to 1947, the area was part of the British-mandated territory of Palestine.
- **1948–1967:** After the **1948 Arab-Israeli War**, the West Bank was occupied and later annexed by Jordan. This annexation was not widely recognized internationally.

- **1967 Six-Day War:** Israel captured the West Bank during the 1967 Six-Day War and argues that the area is “**disputed**” rather than “**occupied**.”
- **Oslo Accords:** Beginning with the **1993 Oslo Accords**, parts of the West Bank were put under varying degrees of Palestinian self-rule through the Palestinian Authority (PA).
- **International status:** The international community overwhelmingly considers the West Bank to be occupied territory.
 - ♦ **The International Court of Justice (ICJ)** and the **United Nations** have ruled that Israeli settlements in the West Bank are illegal under international law.

Source: DD News

LADAKH DELEGATES OFFERED TERMS OF ARTICLE 371

Context

- Ladakh's two key socio-political amalgams, Leh Apex Body (LAB) and Kargil Democratic Alliance (KDA) decided to resume talks with the Ministry of Home Affairs (MHA) on Statehood and Sixth Schedule.
- ♦ The Centre has reportedly proposed **special provisions under Article 371** of the Constitution as a potential alternative to Sixth Schedule status.

Background

- In **2019**, the former State of Jammu & Kashmir was bifurcated into two Union Territories — Jammu & Kashmir, and Ladakh, the latter without a Legislative Assembly.
- After its special status was removed, several political groups in Ladakh have been demanding that land, employment, and the cultural identity of Ladakh, should be protected under the **Sixth Schedule**.
- In 2019, the **National Commission for Scheduled Tribes** recommended the inclusion of Ladakh under the Sixth Schedule.

Sixth Schedule

- The Sixth Schedule under **Article 244** provides for the formation of autonomous administrative divisions — **Autonomous District Councils (ADCs)** — that have some legislative, judicial, and administrative autonomy within a state.
- This Schedule contains provisions regarding the administration of tribal areas in the states of **Assam, Meghalaya, Tripura and Mizoram**.

- The Schedule also gives ARCs and ADCs the power to collect land revenue, impose taxes, regulate money lending and trading, collect royalties from licenses or leases for the extraction of minerals in their areas, and establish public facilities such as schools, markets, and roads.

Protections offered under Article 371

- **Articles 371** and 371-A through J provide “special provisions” for specific states, often to give representation to certain religious and social groups and to allow these groups to exercise autonomy over their affairs without interference from the state and central governments.
- Special provisions under **Article 371** would allow protections to be extended to the local population of **Ladakh**.

Source: TH

SCIENTISTS USE 'ATOMIC STENCILS' TO MAKE DESIGNER NANOPARTICLES

Context

- Researchers have developed a method to precisely create patchy nanoparticles with atomic-level control called **atomic stencilling**.

About

- **Atomic Stencilling** allows scientists to selectively “paint” polymers onto gold nanoparticles to form distinct surface patterns.
- **Nanoparticles** are tiny particles, serving as the building blocks for revolutionary technologies in medicine, electronics, and energy.
 - ♦ However, to create truly complex and functional materials, **scientists need nanoparticles with different surface domains** that can guide how they connect together and organise particular patterns.
 - ♦ Creating these patchy nanoparticles with precision and in large quantities has been a major hurdle.
- Using the stencilling technique, the team successfully **created more than 20 types of patchy nanoparticles with unique patterns**.

Significance

- This new level of control over nanoparticle design is a crucial step toward creating **metamaterials**, which are engineered materials with unique properties not found in nature, such as the ability to manipulate light and sound in new ways.

- **The applications are vast**, potentially leading to advances in targeted drug delivery, ultra-efficient catalysts, next-generation electronics, and new classes of smart materials.

Source: TH

IRAN RATIFIES UN CONVENTION AGAINST TERROR FINANCING

Context

- Iran has ratified a law to join the **United Nations International Convention for the Suppression of the Financing of Terrorism (CFT)** in a bid to align with global financial norms.

About

- **FATF status:** As of October 2025, Iran remains on the **FATF blacklist** for its failure to adopt sufficient anti-money laundering (AML) and counter-terrorist financing (CFT) standards.
 - ♦ The ratification is seen as a first step toward potential re-evaluation by the FATF.

About the CFT

- The CFT was adopted by the **United Nations General Assembly** on 9 December 1999 (Resolution 54/109).
- **Objective:** To criminalize the financing of terrorism and establish international cooperation mechanisms to prevent, investigate, and prosecute such offences.
 - ♦ It requires countries to **strengthen financial oversight, share intelligence**, and cooperate in law enforcement.
- **International Legal Framework:** Complements other UN instruments such as the UN Security Council Resolution 1373 (2001) and the UN Convention against Transnational Organized Crime (2000).
- **India has ratified** the CFT and has incorporated its provisions through:
 - ♦ Unlawful Activities (Prevention) Act (UAPA), 1967
 - ♦ Prevention of Money Laundering Act (PMLA), 2002.

Financial Action Task Force (FATF)

- **The Financial Action Task Force (FATF)** is an intergovernmental organization which leads global action to tackle money laundering, terrorist and proliferation financing.

- **History:** FATF was established in **1989** by the **G7** to examine and develop measures to combat money laundering. It originally included the G7 countries, the European Commission and eight other countries.
 - ♦ In **2001**, the FATF expanded its mandate to also combat terrorist financing.
- **Members:** FATF has **40** members including **India**.
- FATF has the authority to issue warnings and sanctions against countries that fail to comply with its standards, such as suspension of membership and blacklisting.

FATF 'Grey list' and 'Blacklist'

- **Black List:** Countries known as Non-Cooperative Countries or Territories (NCCTs) are put on the Blacklist. These countries support terror funding and money laundering activities.
- **Grey List:** Countries that are considered a safe haven for supporting terror funding and money laundering are put in the FATF Grey list.

Source: TH

PROF EKNATH CHITNIS: VETERAN SCIENTIST WHO PIONEERED INDIA'S SPACE PROGRAMME

In News

- Renowned Indian space scientist Eknath Vasant Chitnis passes away.

Major Roles and Contributions

- He was one of the last surviving associates of Dr. Vikram Sarabhai, the father of India's space programme.
- He is also credited for guiding the then budding scientist Dr APJ Abdul Kalam.
- He played a crucial role in the early years of the **Indian National Committee for Space Research (INCOSPAR)** which later transformed into the Indian Space Research Organisation (ISRO).
- He also played a crucial role in **selecting the site for India's first rocket launch** at Thumba in Kerala.
- He directed the **Satellite Instructional Television Experiment (SITE)** in 1975–76, which broadcast educational content to 2,400 villages using NASA's ATS-6 satellite — a milestone in India's digital revolution.

- From 1981 to 1985, he served as the second director of ISRO's Space Applications Centre (SAC) in Ahmedabad.

Honours

- He was awarded the Padma Bhushan in 1985 for his contributions to science and technology.

Source:TH

2025 SAKHAROV PRIZE

Context

- Two imprisoned journalists **Andrzej Poczobut in Belarus** and **Mzia Amaghlobeli in Georgia**—have won the **2025 Sakharov Prize**.

About the Prize

- The **Sakharov Prize for Freedom of Thought** is the European Union's highest human rights award, established in **1988** and named after **Soviet dissident and Nobel Peace laureate Andrei Sakharov**.

- It honours individuals or groups defending **human rights and fundamental freedoms**.
- The final winner or winners of the Sakharov Prize are chosen by the **Conference of Presidents**, a European Parliament body led by the president, which includes the leaders of all the political groups represented in the Parliament, making the choice of laureates a truly European choice.
- The award carries an **endowment of €50,000** and is presented at the **European Parliament in Strasbourg** (France) each December.

Do you know?

- Several Sakharov laureates, including **Nelson Mandela, Malala Yousafzai, Denis Mukwege, and Nadia Murad**, later went on to win the **Nobel Peace Prize**.
- Interestingly, **Venezuelan opposition leader María Corina Machado**, who won the 2025 Nobel Peace Prize earlier this month, received the **Sakharov Prize** last year.

Source: TH

