

14th to 20th July, 2024

# CURRENT AFFAIRS for UPSC

DreamIAS

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## INTERNATIONAL

### TRUMP SEASON

As the Republican National Convention drew to a close in Milwaukee, Wisconsin, it became obvious that the Party's expected nominee for the 2024 U.S. presidential election in November, former President Donald Trump, is not only capitalising on the popularity boost that he has inevitably benefited from since surviving an assassination attempt a week earlier, but has now established total control of the Republican Party and is in a strong position to take on incumbent President Joe Biden in that regard. The Convention itself marked several firsts — not only was Mr. Trump's speech the first major public remarks he delivered since the assassin's bullet injured his ear but otherwise left him unscathed, but the Convention itself was held for the first time in person since the COVID-19 pandemic resulted in the cancellation of all public political events in 2020. It would also appear that Republican strategists have deepened their appreciation of optics as far as Mr. Trump's appeal among the electorate goes. There was a distinct attempt to project the political power of women at the event, almost as if to soften the former president's image, which was in years past battered by revelations of his unflattering remarks about women. Mr. Trump's wife Melania made a rare appearance at the event, as did his 17-year-old granddaughter Kai, his daughter-in-law and co-chair of the Republican National Committee, Lara, Arkansas Governor Sarah Sanders, Mr. Trump's former Press Secretary, and Indian American Usha Chilukuri Vance, who is the wife of Mr. Trump's running mate, J.D. Vance.

There is much to analyse in Mr. Trump picking the 39-year-old Mr. Vance for Vice Presidential candidate in the upcoming race. Mr. Trump is evidently keen to win over younger demographic cohorts in this election; he is also aligned to white, male America, and what it stands for in the country's fraught politics today. There is also a geographic message in the subtext — as the junior Senator from Ohio, Mr. Vance could also become a critical interlocutor for the Trump campaign's engagement with the all-important Rust Belt states — swing states of the mid-western U.S. that can potentially make or break a presidential candidate. While there is no denying Mr. Trump's overall strong position and lead in swing states according to several national polls, three months is a long time in politics, and that certainly applies to the U.S.

### CALIFORNIA LAW ON GENDER IDENTITY IN SCHOOLS: THE PROVISIONS AND THE DEBATE

California has become the first US state to prohibit schools from sharing information about its students' gender identity and sexual orientation with anyone without the students' consent, including their parents. The policy was part of the Support Academic Futures and Educators for Today's Youth Act or the SAFETY Act.

— Supporters of the law have hailed it as progressive legislation protecting the privacy of LGBTQIA+ youth, while critics have argued that parents have the right to information about their child's activities at school.

— The SAFETY Act came after several school districts in California passed policies requiring parents to be notified if a child requested to change their gender identification, The AP reported.

— The issue of LGBTQ+ rights and policies have increasingly drawn polarised reactions in US politics in recent years. Republican states have sought to restrict discussions on LGBTQ+ matters



in schools, while Democratic states have advocated for greater visibility of diverse gender and sexual identities.

**For Your Information:**

— India has taken various steps since the NALSA judgment in 2014, including the Transgender Persons (Protection of Rights) Act of 2019. Recently, an advisory body has been tasked with looking into the inclusion of the transgender community in the armed forces.

— Data is clear globally: LGBTQ+ young people continue to suffer higher health and suicide risks than their peers. According to a 2019 report by UNESCO New Delhi, physical bullying affects 60 per cent of high school and middle school students and affects 50 per cent of students in higher secondary schools. The same report also said that in primary schools, the incidence of sexual violence was as high as 43 per cent.

## UNPRINCIPLED ALLIANCES

The adage that there are no permanent enemies and no permanent friends, only permanent interests in politics could explain many a twist in shifting political alliances across the democratic world. But it would only be an understatement in Nepali politics, where the art of coalition making has for long been a farce. On Saturday, incumbent Nepal Prime Minister Pushpa Kamal Dahal of the Communist Party of Nepal (Maoist Centre) predictably lost a trust vote, after only 63 of the 275-member House of Representatives backed him, while 194 lawmakers voted against the motion of confidence. The loss was a foregone conclusion after the Communist Party of Nepal (Unified Marxist-Leninist) led by Khadka Prasad Oli — he has been made the Prime Minister again — withdrew support from the CPN(MC)-led government and joined hands with the opposition Nepali Congress, led by Sher Bahadur Deuba. Mr. Dahal had managed to hold his post for close to two years, and after surviving three trust votes — all necessitated by his decision to change partners. The CPN(MC) had formed the government after the November 2022 elections, despite finishing a distant third and Mr. Dahal had managed to do so by exploiting the differences between the Deuba-led NC and the Oli-led CPN(UML). These two parties won 89 and 78 seats, respectively, in 2022, and have now formed a coalition government with the arrangement that Mr. Oli and Mr. Deuba will share the post of Prime Minister, each for half of the remaining term.

Ever since Nepal transitioned from an absolute monarchy to a constitutional one in 1990, and then to a full-fledged republic in 2008, its democratic polity has been marked by instability and constant changes in power, leading to poor governance. Despite the institution of constitutional reforms related to federalism and guaranteed representation for marginalised forces following a civil war and the overthrow of the monarchy, the outcomes have been a perpetuation of the country's status as a "least developed country". It is quite evident that the leadership of the three major parties have shown more interest in sticking to power by any means irrespective of whether they are driven by pre-poll coalitions or not. Besides, the inherent instability in a parliamentary system that reflects social fissures in the country has led to a form of coalition politics that is driven less by ideological or principled considerations and more by a hankering towards power. Such instability and an unprincipled pursuit of power will only result in more disillusionment among the Nepali people with the democratic process. Nepal can perhaps be better off with a presidential system that allows for a directly elected head of state.



## PAKISTAN GOVERNMENT'S MOVE TO BAN IMRAN KHAN'S PTI SERVES NO PUBLIC INTEREST

Even by the low standards of Pakistan's democracy, the government's move to ban the Pakistan Tehreek-i-Insaf (PTI) and bring charges of treason against former prime minister Imran Khan and other leaders strikes a jarring note. It neither serves public interest nor can it be read as a strategy to consolidate power. It only shows disrespect for a democratic mandate and for the country's judiciary. Given the state of Pakistan's economy, its internal security challenges and potential for greater civil unrest, it is important for all the stakeholders to take a step back.

The ruling coalition in Islamabad — made largely of the PML(N) and PPP — came to power in February under a cloud. The Election Commission of Pakistan had denied the PTI its election symbol just over a month before voting and Khan, convicted and jailed under corruption charges, was unable to contest. The PML(N) was widely seen as enjoying the backing of the Army. Despite the system being apparently rigged against it, PTI-backed independents emerged as the single-largest bloc in the National Assembly (NA). Instead of making an effort to burnish its credibility, the government seems to be headed the other way. The announcement of its intent to ban PTI came less than a week after the country's supreme court recognised the party — it can now nominate minority and women members, which it could not do when its legislators were technically "independents".

Overruling democratic mandates has been normalised in Pakistan. Critics of Khan and the PTI may also point to the party's courting of extremists. But the current moment has more complications: First, Pakistan's economy is in its worst-ever state, dependent on bailouts by agencies like the IMF. "Reforms" and "stability" are among the conditions for such aid — and political uncertainty make going ahead with them all but impossible. Second, while the Army's support continues to be essential for any government, its sheen has worn off in no small part due to the attacks by the PTI. Finally, there are murmurs within the ruling coalition that a ban on the PTI might be a step too far. The political class in Pakistan, including the PTI leadership, must remember that it is only through the political process that the country can hope to climb back from the abyss.

# DreamIAS



## NATION

### JAISHANKAR: INDIA'S TIES WITH MAURITIUS HAVE BLOSSOMED INTO ROBUST PARTNERSHIP

India remains committed to strengthening the critical partnership with Mauritius that is “so important for the future of the Indian Ocean region,” External Affairs Minister S Jaishankar said, on the first day of his two-day visit to Mauritius on Tuesday.

— During his visit, inauguration of 12 High Impact Community Development Projects that are funded by India took place, apart from the exchange of MoUs on education, culture, the digitisation of Immigration Archives and the exchange of Project Plan Documents between the Indian Space Research Organisation (ISRO) and Mauritius Research and Innovation Council (MRIC).

— The visit underscores the importance of the India-Mauritius relationship and is a reflection of India’s ‘Neighbourhood First Policy’, Vision SAGAR, and commitment to the Global South.

#### **For Your Information:**

— Mauritius has been on the canvas of renewed diplomatic engagement, particularly Agalega island, a far-flung part of the country more than 1,100km (684 miles) from the main island.

— India’s role in the development of the upgraded airstrip on the Agalega island is well marked, and it allows the Indian Navy to operate P-8I maritime reconnaissance aircraft, which is a significant strategic hook for not just India’s access to the key maritime base, but also a strategic move to counter China, in the wake of its aggressive maritime strategy.

— China’s free trade agreement with Mauritius in early 2021 was swiftly followed by the announcement of India’s comprehensive economic partnership with Mauritius.

## ARREST AND LIBERTY

Two observations made in different contexts by the Supreme Court of India have raised relevant issues concerning personal liberty. The cases related to actions under the Prevention of Money Laundering Act (PMLA), and the significance of these observations lies in the extent to which courts are inclined to protect personal liberty in the face of a determined government that wants its agencies to have their way. One concerned the question whether an officer arresting a person on money-laundering charges should demonstrate the necessity for arrest for the action to be deemed valid; and the other voiced shock and revulsion at the ease and quickness with which courts were staying reasoned orders granting bail. A Bench headed by Justice Sanjiv Khanna granted interim bail, for the second time since his arrest in March, to Delhi Chief Minister Arvind Kejriwal, in the course of a discussion on the legality of his arrest by the Enforcement Directorate (ED). The 64-page verdict ended with a reference to a larger Bench the question whether the ED would have to prove the need or “necessity to arrest” a person, before effecting an arrest. Section 19 of PMLA speaks of the arresting officer being required to have “reason to believe” that the person is guilty of money-laundering before effecting arrest.

The PMLA casts a statutory obligation on an officer to both record reasons for arrest and convey grounds for arrest to the accused. Whether these obligations include a duty to demonstrate the necessity to arrest the person will have to be decided. It is established that the existence of a power



is not sufficient justification for exercising it. The heartening feature of the Court's order is that it lays down the view that the authorised officer's decision on arrest ought to be rooted in compliance with statutory requirements, and one that a magistrate or judge can examine. The Court has also done well to reiterate that arrests under the PMLA cannot be on a mere whim; and that decisions during investigation should consider exculpatory material too, and not merely material against the accused. The other issue, regarding another Bench's shock over courts staying bail orders, touches upon a key aspect of contemporary judicial functioning. The vehemence with which the prosecution argues its case, be it against bail or challenging a court's order granting it, seems to be a major factor in the approach of higher courts. As the Bench noted, a stay on reasoned orders ought to be rare exceptions based on grounds such as perversity by the lower court, and not done as a matter of routine.

### WRONGHEADED POLICY

Despite the fact that attempts to provide reservation in jobs for local workers have been proven unconstitutional and have been rejected by courts, the temptation to pander to nativist sentiments remains among State governments. A case in point is the draft Karnataka State Employment of Local Candidates in the Industries, Factories and Other Establishments Bill, 2024, cleared by the Congress government's cabinet but later "temporarily withheld" following an uproar from industry heads and trade bodies in Karnataka. The Bill envisaged that industries and other establishments would appoint local candidates in 50% of management positions and 70% of non-management positions, and set stringent criteria for defining local candidates. Similar Bills were passed in Andhra Pradesh in 2019, Haryana in 2020, and Jharkhand in 2023. While the Karnataka Bill added proficiency in Kannada as one of the criteria to define eligibility of a local candidate, the Haryana and Andhra Pradesh laws were largely based on residency criterion. The Punjab and Haryana High Court quashed the Haryana Act in 2023 holding it violative of equality guaranteed under Article 14 and freedom under Article 19 of the Constitution. It added that the Act went against the rights of citizens from the rest of the country and that States enacting such laws could set up "artificial walls" throughout India. The Andhra Pradesh Act is still being heard in court, while the Jharkhand Bill has not been implemented. Apart from the aforementioned reasons, the Karnataka Bill is also violative of Article 16(3) that allows for reservation based on residence, but limits it to public employment and to be enforced only by a law made in Parliament and not by a State Legislature.

The temptation for the Karnataka government to come up with Bills that provide for reservation for locals and labour protectionism despite their proven unconstitutionality is perhaps motivated by the fact that there is resentment among resident workers in better-off States that their jobs are being taken over by migrant workers. This is especially so among those aspiring for jobs in the private sector, where some employers have sought to exploit migrant workers to work for longer hours and at lower pay without benefits or social protections and without political support that is otherwise available to local workers. If Karnataka is concerned about this segmentation of the labour market that pits the migrant worker against the locals, it should enforce labour rights for the former as well; and by curbing exploitative practices, it could create a level playing field for all workers. Protectionism for the local worker and parochialism is not the answer.

### HOW THE SYSTEM FAILED RAHIM ALI, INDIAN

The Supreme Court's judgment last week confirming, after a 12-year legal battle, that Rahim Ali is an Indian citizen, is a judicial milestone. Its sheen, however, is dimmed by the fact that Ali is not



present in his moment of vindication. He died two-and-a-half years ago, after living with the constant fear that he would be uprooted from his home in Kashimpur village, Nalbari district, Assam. Ali's story, at once tragic and absurd, is symbolic of the promises not kept in the fundamental social contract between citizen and state, enshrined in the Constitution's letter and spirit. Ali's wife, Hajera Bibi, on learning of the Court's verdict, told this newspaper: "What is the point now? The fear that he lived under, of being taken away, died with him. If they still wanted to call him a foreigner, what would they have done? Picked him up from his grave?" The question, steeped in sadness and anger, is a reproach. It is also a call for accountability from an opaque and labyrinthine process that casts the onus of proving their innocence on the vulnerable.

Under Section 6 of the Foreigners Act, people excluded from the citizenship register can file an appeal in a Foreigners Tribunal (FT). In 2012, an FT delivered an ex-parte order declaring Ali a foreigner. The Gauhati High Court dismissed his petition, filed on the grounds that he could not appear before the FT because of a medical condition. Rahim Ali's family — mostly agricultural labourers — sold or mortgaged what little property they had to meet travel and legal expenses. After years of twists and turns, when the SC finally upheld his citizenship, it was too late. Unfortunately, his tale is not unique. The Assam government's figures paint a shocking picture: According to its submission in the state assembly in February, 100 FTs had disposed of 3,37,186 cases at the end of last year and 1,59,353 people were declared foreigners. As many as 94,149 cases are still pending. How many of the 1,59,353 have been unfairly stripped of their citizenship like Rahim Ali? For how long, and by what justification, will the nearly 1 lakh people whose cases are pending live under the Sword of Damocles? If, like with Ali, it is found that the FTs and Assam police were wrong, will the government compensate them — can it — for their trauma, time and expenses?

The SC chided the state police for not having any material support for its claim that Ali came from Bangladesh. It must also look into why quasi-judicial and judicial bodies saw fit to disenfranchise him despite the lack of evidence. Disturbing, too, is the rise of a political idiom that seeks to paint many like Ali with the broad brush of exclusion. On Wednesday, Assam Chief Minister Himanta Biswa Sarma raised a familiar bogey at a meeting in Jharkhand: "I've witnessed this ['love jihad' and 'land jihad'] firsthand in Assam, where 40 per cent of the population comprises Bangladeshi infiltrators." The figure he cites is close to the Muslim population of the state. The Constitution promises liberty, equality and dignity to every citizen. The criminalisation and disenfranchisement of Ali, and others like him, is a betrayal of that promise. Until that changes, Hajera Begum's question — what is the point now? — will continue to tar a justice that is hard to find or comes too late.

## HOW DO ASSAM'S FOREIGNERS TRIBUNALS FUNCTION?

### The story so far:

On July 5, the Assam government asked the Border wing of the State's police not to forward cases of non-Muslims who entered India illegally before 2014 to the Foreigners Tribunals (FTs). This was in keeping with the Citizenship (Amendment) Act of 2019 that provides a citizenship application window for non-Muslims — Hindus, Sikhs, Christians, Parsis, Jains, and Buddhists — who allegedly fled persecution in Afghanistan, Bangladesh, and Pakistan.



### **How did the FTs come about?**

The FTs are quasi-judicial bodies formed through the Foreigners (Tribunals) Order of 1964 under Section 3 of the Foreigners' Act of 1946, to let local authorities in a State refer a person suspected to be a foreigner to tribunals. The FTs are currently exclusive to Assam as cases of "illegal immigrants" are dealt with according to the Foreigners' Act in other States. Each FT is headed by a member drawn from judges, advocates, and civil servants with judicial experience. The Ministry of Home Affairs told Parliament in 2021 that there are 300 FTs in Assam but the website of the State's Home and Political Department says that only 100 FTs are currently functioning, beginning with 11 established before the Illegal Migrants (Determination by Tribunals) Act of 1983 was scrapped in 2005.

### **What is the role of the Border police?**

The Assam Police Border Organisation was established as a part of the State police's Special Branch in 1962 under the Prevention of Infiltration of Pakistani (PIP) scheme. The organisation was made an independent wing in 1974 and is now headed by the Special Director General of Police (Border). After the liberation war of Bangladesh, the PIP scheme was renamed Prevention of Infiltration of Foreigners or PIF scheme. The Centre has sanctioned the posts of 3,153 out of the 4,037 personnel of this wing under the PIF scheme while 884 are sanctioned by the Assam government. The members of this wing are tasked with detecting and deporting illegal foreigners, patrolling the India-Bangladesh border with the Border Security Force, maintaining a second line of defence to check the entry of illegal foreigners, and monitoring people "settled in riverine and char (sandbar) areas". This is apart from referring people of suspicious citizenship to the FTs to decide whether they are Indian or not based on documents. Cases of 'D' or doubtful voters can also be referred to an FT by the Election Commission of India and people excluded from the complete draft of the National Register of Citizens (NRC) released in August 2019 can appeal to the FT concerned to prove their citizenship. Some 19.06 lakh out of 3.3 crore applicants were excluded from the NRC, whose process has been on hold.

### **How does an FT function?**

According to the 1964 order, an FT has the powers of a civil court in certain matters such as summoning and enforcing the attendance of any person and examining him or her on oath and requiring the production of any document. A tribunal is required to serve a notice in English or the official language of the State to a person alleged to be a foreigner within 10 days of receiving the reference from the authority concerned. Such a person has 10 days to reply to the notice and another 10 days to produce evidence in support of his or her case. An FT has to dispose of a case within 60 days of reference. If the person fails to provide any proof of citizenship, the FT can send him or her to a detention centre, now called transit camp, for deportation later.

### **Why are some FT orders under fire?**

On July 11, the Supreme Court set aside an FT order declaring Rahim Ali, a deceased farmer, a foreigner 12 years ago. The apex court called the order a "grave miscarriage of justice" while pointing out that the Foreigners' Act does not empower the authorities to pick people at random and demand that they prove their citizenship. In September 2018, an FT member in central Assam's Morigaon observed that foreigners' cases have assumed the form of an industry where everyone involved is "trying to mint money by any means". The member also noted that notices are "hung up on some trees or electric pole" without the suspected non-citizens unaware of such a case against them.





## TOP COURT QUASHES BIHAR DECISION TO CLASSIFY TANTI-TANTWA AS SC

The Supreme Court on Monday ruled that states cannot make changes to the Scheduled Caste list published under Article 341 of the Constitution and quashed the 2015 Bihar government notification categorising Tanti-Tantwa community as Scheduled Caste.

— The court said the state government had no competence or authority to tinker with the lists of Scheduled Castes published under Article 341 of the Constitution and directed the group be reverted to its original category of Extremely Backward Class. It called the notification “mala fide” and unpardonable “mischief”.

— The Bihar Legislature had enacted the Bihar Reservation of Vacancies in Posts and Services (for Scheduled Castes, Scheduled Tribes and other Backward Classes) Act, 1991 (Act No.3 of 1992). Under the Act, it had declared the lists of Extremely Backward Classes and at serial number 33, Tanti-Tantwa was shown as falling under the Extremely Backward Classes.

— In 2011, Bihar government had recommended inclusion of Tanti-Tantwa in the list of SCs as a synonym of “Pan, Sawasi, Panr”.

### **For Your Information:**

— A high-level panel has been formed to examine the administrative steps that can be taken to safeguard the interests of scheduled caste communities like the Madigas.

— The panel will seek to ensure fair allocation of benefits to the most disadvantaged communities within the Scheduled Castes, which have been overshadowed by comparatively affluent and influential groups.

## KEY ISSUE WILL BE BACK IN SC: WHAT CONSTITUTES A MONEY BILL?

The Supreme Court has agreed to “take the call” on hearing petitions challenging the “Money Bill route” taken by the government to push through contentious legislation in Parliament.

With the Union Budget scheduled for July 23, Senior Advocates Kapil Sibal, Abhishek Manu Singhvi, and Indira Jaising approached the Bench of Chief Justice of India (CJI) D Y Chandrachud on Monday, seeking an urgent hearing in the matter.

The CJI said he would decide when he forms the Constitution Benches.

Money Bills offer a fast-track route to enact legislation because they do not require passage in Rajya Sabha. Several important laws including amendments to the Prevention of Money Laundering Act, 2002, (PMLA) and the Foreign Contributions Regulations Act, 2010, (FCRA) as well as the Aadhaar Act, 2016, have been passed by this route in recent years, circumventing the Upper House, where the NDA may have had to struggle for numbers at the time.

The question of which Bills can be designated as Money Bills was referred to a seven-judge Bench in November 2019 by a five-judge Bench led by then CJI Ranjan Gogoi in *Roger Mathew vs South Indian Bank Ltd.* In October 2023, CJI Chandrachud had said the seven-judge Bench would be set up soon.



### Money Bill in Constitution

In the usual process of lawmaking, a Bill must be passed by majorities in both Lok Sabha and Rajya Sabha. The exception are a category of Bills known as Money Bills.

Under Article 109, a Money Bill shall be introduced only in Lok Sabha and, upon passage, transmitted to Rajya Sabha for its “recommendations”. Rajya Sabha must revert within 14 days, but it is up to Lok Sabha to accept or reject any or all of its recommendations. If the Bill is not returned by Rajya Sabha within the stipulated period, it is considered passed anyway.

To ensure this process is not abused, Article 110 provides a strict definition of a Money Bill. In order for a Bill to be designated as a Money Bill, it must contain “only provisions dealing with all or any” of a specific list of subjects. These subjects include taxation, financial obligations of the Government of India, the Consolidated Fund (revenue received by the government through taxes and expenses incurred in the form of borrowings and loans) or Contingency Fund (money to meet unforeseen expenditure) of India, or “any matter incidental” to the matters listed in the Article.

Under Article 110(3), “If any question arises whether a Bill is a Money Bill or not, the decision of the Speaker of the House of the People thereon shall be final.”

### The important cases in SC

**CHALLENGE TO AADHAAR ACT:** In September 2018, the court ruled in favour of the government, upholding the constitutionality of the Aadhaar law by a 4-1 majority. The petitioners argued that the Act were passed as a Money Bill, even though it contained provisions that were unrelated to the subjects listed under Article 110.

Justice Ashok Bhushan, who concurred with the majority, wrote that the main aim of the Act was to provide subsidies and benefits, which involves expenditure from the Consolidated Fund, and qualified the Act to be passed as a Money Bill.

Justice D Y Chandrachud (he was not CJI at the time), was the sole dissenting voice. He observed that the use of the Money Bill route in this case was an “abuse of the constitutional process”, and that passing an ordinary Bill as a money Bill limits the role of Rajya Sabha in lawmaking.

**FINANCE ACT, 2017:** The Finance Act, 2017 included amendments to a number of Acts which, among other things, empowered the government to notify rules regarding the service conditions of members of Tribunals. Shortly afterward, the Centre notified the Appellate Tribunal and Other Authorities (Qualifications, Experience and Other Conditions of Service of Members) Rules of 2017 (Tribunal Rules).

A host of petitioners, including the Madras Bar Association, the All India Lawyers’ Union, and Congress MP Jairam Ramesh argued that the Finance Act, 2017, must be struck down in its entirety as it contained provisions that had no connection with the subjects listed in Article 110.

In November 2019, a five-judge Bench struck down the Tribunal Rules as unconstitutional for interfering with judicial independence, but referred the Money Bill aspect to a larger seven-judge Bench. The court observed that the five-judge Bench in the Aadhaar case did not elaborate upon what makes a valid Money Bill.

**SINCE 2019:** In the years since the 2019 judgment, the court has stopped short of addressing the Money Bill question in several cases, given the pending seven-judge Bench case. These include the



challenge to the wide powers of the Enforcement Directorate under the PMLA, where the restrictive bail conditions under Section 45 were introduced through a Money Bill (the Finance Act, 2018), and the challenge to the Centre's Electoral Bond scheme which was facilitated through amendments to key laws through the Money Bill route.

## RESTORING A VERDICT

INDIA bloc parties won 10 of the 13 Assembly seats across seven States where by-polls were held on July 10 and the results were announced on July 13. The popular verdict broadly echoes the recent Lok Sabha election results that signalled a fatigue with the Bharatiya Janata Party (BJP). The by-poll results indicate that the BJP's politics is encountering some resistance on the ground. Of particular note is Himachal Pradesh where the Congress won two of the three Assembly seats which fell vacant after three independent legislators joined the BJP after resigning their seats. The government of Chief Minister Sukhvinder Singh Sukhu had teetered on the brink in February after six Congress MLAs, along with these three independents, had voted in favour of a BJP candidate in a Rajya Sabha contest. They were later disqualified from the Assembly after Congress candidate Abhishek Manu Singhvi lost the Rajya Sabha poll. This had brought down the party's tally to 34 in the 68-member House. With its victories in Dehra and Nalagarh, the Congress has returned to its original strength of 40 MLAs. The Sukhu government had won a majority on June 4 when the Congress won four of the six seats that had by-polls alongwith the 2024 Lok Sabha election. By restoring the numbers of the Congress, the electorate of Himachal Pradesh has rejected the opportunism of the defectors and the overreach of the BJP.

Something similar happened in Uttarakhand too, as the Congress retained the Badrinath seat. The sitting MLA from the seat, Rajendra Singh Bhandari, who had defected to the ruling BJP, was defeated by Congress's Lakhapat Singh Butola. It is not that all defectors are being rejected by the people. The Congress continued to suffer losses in Madhya Pradesh where Kamlesh Pratap Shah, who had switched sides to the BJP, won a tough contest against his former party. The continuing decline of the Congress in the State is a clear message to the party that it needs to look beyond the current local leadership. While the Dravida Munnetra Kazhagam's win in Tamil Nadu's Vikravandi seat further reinforced its position, in West Bengal, the Trinamool Congress (TMC) continued to reign supreme by wresting three seats from the BJP, in Raiganj, Ranaghat Dakshin and Bagda. In all the three seats, MLAs of the saffron party had switched sides to the TMC, which is the ruling party in the State. The TMC also retained the Maniktala seat. In Punjab, the Aam Aadmi party got its pound of flesh from the BJP as it trounced the sitting MLA in Jalandhar West who had defected to the BJP and sought a re-election. All the parties should heed the voice of the people, seek consensus and reduce conflict, and eschew opportunistic defections.

### Note:

This is an analysis of 66 MLAs who defected in six States — Andhra Pradesh, Himachal Pradesh, Uttarakhand, Karnataka, Madhya Pradesh, and Manipur. Of them, 59 (89%) were fielded again in subsequent polls by the parties they jumped to. Among the 59, the re-election rate, or the share who won again after jumping ship, was considerably high (70%).



## ON POLITICAL REPRESENTATION OF WOMEN

### The story so far:

In the recently concluded general elections in the U.K., a record 263 women MPs (40%) have been elected to the House of Commons. The South African National Assembly has around 45% women representation, while the U.S. House of Representatives has 29%. Universal suffrage was achieved in various parts of the world after prolonged political movements. New Zealand as a self-governing unit under British rule was the first to grant universal women suffrage in 1893. The U.K., itself provided all its women the right to vote only in 1928. The U.S., granted equal voting rights through the nineteenth amendment only in 1920.

### What about women representatives in independent India?

India as a sovereign republic provided the right to vote for all its women right from the first general elections in 1952. While the right to vote was provided to all women since the commencement of the Constitution, the representation of women in the Lok Sabha and State legislative assemblies has been far from satisfactory. The percentage of women MPs in the Lok Sabha had been very low between 5% and 10% till 2004. It rose marginally to 12% in 2014 and currently stands at 14% in the 18th Lok Sabha. The representation in State Legislative Assemblies is even poorer with the national average being around 9%.

The 73rd and 74th amendments of the Constitution in 1992/1993, provided for one-third reservation for women in panchayats and municipalities. However, attempts between 1996 and 2008 to provide similar reservation in the Lok Sabha and assemblies were unsuccessful.

### How do women MPs fare worldwide?

Women representation in parliament varies across different democracies. It is a perennial issue to promote higher representation for women who constitute half the population in all countries. The important methods used across the world to ensure higher representation of women are

- a) voluntary or legislated compulsory quotas for candidates within political parties and
- b) quota in parliament through reservation of seats.

Quotas within political parties provide more democratic choice to voters and allows flexibility to parties in choosing women candidates. Opponents of having a reserved quota in parliament for women argue that it would be seen as women not competing on merit. As the seats reserved for women would be rotated after each delimitation, it may also reduce the incentive for MPs to work hard to nurture their constituencies. Countries like Bangladesh and Pakistan that have quotas in parliament fare poorer than countries with political party quotas.

### What is the 106th amendment?

As on April 2024, India ranks 143 in the list of countries in the 'Monthly ranking of women in national parliaments' published by the Inter-Parliamentary Union, a global organisation for national parliaments. The Trinamool Congress has the highest proportion of women MPs in the current Lok Sabha at 38%. The ruling Bharatiya Janata Party and principal Opposition Congress party have around 13% each. Naam Tamilar Katchi, a State party in Tamil Nadu, has been following a voluntary quota of 50% for women candidates in the last three general elections.



However, voluntary or legislated quotas within political parties are unlikely to yield the desired representation in our country. This is why the Parliament through the 106th constitutional amendment, in September 2023, provided for one-third reservation of seats for women in the Lok Sabha and State legislative assemblies. This would ensure a fair representation of women in legislatures that would increase gender sensitivity in parliamentary processes and legislation. It would also hopefully increase the number of women Ministers in the Centre and States.

This reservation shall come into effect based on the delimitation exercise after the relevant figures of the first Census conducted after the commencement of this act is published. Hence, the Census which is overdue since 2021 should be conducted without any further delay to ensure that this reservation is implemented starting with the general elections in 2029.

#### GOVT TO MARK 75 YRS OF CONSTITUTION IN BID TO COUNTER OPP

— The Government has decided to observe June 25, the day the Emergency was declared in 1975, as “Samvidhaan Hatya Diwas” to commemorate the “massive contributions” of those who endured “inhuman pains of the period”.

Government sources said though the Constituent Assembly adopted the Constitution on November 26, 1949, the “75 years of Constitution” campaign might kick off on August 15 or later in the year and conclude on January 26 of next year to coincide with the day in 1950 when the Constitution came into effect and India became a Republic.

— Till now, three times an emergency has been imposed in India.

1. The first time the emergency was imposed was on October 26, 1962, on the grounds of war.
2. The second time emergency was imposed on December 3, 1971, on the grounds of war.
3. The third-time emergency was proclaimed on June 25, 1975, due to an “internal disturbance.” (Note: This ground of “internal disturbance” was removed by the Constitution (Forty-fourth Amendment) Act, 1978, by the Janata government that came to power after the emergency.)

#### PUJA KHEDKAR CONTROVERSY: WHAT ARE THE RULES GOVERNING CIVIL SERVANTS?

The Centre last Thursday constituted a single-member committee under the Department of Personnel and Training (DoPT) to examine all documents submitted by probationary IAS officer Puja Khedkar to secure her candidature in the civil services.

Khedkar secured a rank of 821 in the 2022 UPSC Civil Services Examination, and was allotted the Indian Administrative Service (IAS) under the Other Backward Classes (OBC) and Physically Handicapped (PH) quotas. Questions have been raised about her appointment under these categories.

Khedkar also faces multiple allegations of misconduct, from seeking special privileges she is not entitled to as a probationer and “occupying” the ante chamber of the District Collector’s office, to using an unauthorised red-blue beacon on her private car, a luxury Audi sedan which she claims to have received as a “gift”.

In light of this controversy, the Maharashtra government on July 8 decided to transfer Khedkar from Pune to Washim. Khedkar’s actions as a civil servant are governed primarily by two rules:



the All India Services (Conduct) Rules, 1968, and the Indian Administrative Service (Probation) Rules, 1954. What do these rules say?

#### **Rules on 'integrity' of services**

All IAS, Indian Police Service (IPS) and Indian Forest Service officers are governed by the AIS (Conduct) Rules from the time they are allotted their service, and begin training. AIS (Conduct) Rule 3(1) states: "Every member of the Service shall at all times maintain absolute integrity and devotion to duty and shall do nothing which is unbecoming of a member of the Service."

Rule 4(1) is more specific about what is "unbecoming". It states that officers must not use their "position or influence" to "secure employment for any member of his family with any private undertaking or NGO".

In 2014, the government added a few sub-rules. This included that officers should maintain "high ethical standards, integrity and honesty; political neutrality; accountability and transparency; responsiveness to the public, particularly to the weaker sections; courtesy and good behaviour with the public".

Also added were specific directions as to how officers must make decisions. They must do so "solely in public interest... declare any private interests relating to his public duties... not place himself under any financial or other obligations to any individual or organisation which may influence him... not misuse his position as civil servant and not take decisions in order to derive financial or material benefits for himself, his family or his friends...".

According to Rule 11(1), officers may accept gifts from "near relatives" or "personal friends" with whom they have "no official dealings", on occasions such as "weddings, anniversaries, funerals and religious functions". However, they must report (to the government) any gift whose value exceeds Rs 25,000. This threshold was last updated in 2015.

#### **Rules for probationers**

There is an additional set of rules that govern the conduct of officers during their probation period, which lasts for at least two years after selection to the services. This includes the period of the officers' training at the Lal Bahadur Shastri National Academy of Administration (LBSNAA) in Mussoorie. At the end of two years, officers sit for an examination, after clearing which they are confirmed in their respective services.

During the probation period, officers draw a fixed salary and travel allowance. But they are not entitled to, as a right, a number of benefits that confirmed IAS officers receive. These include, among other things, an official car with a VIP number plate, official accommodation, an official chamber with adequate staff, a constable, etc.

Rule 12 gives the circumstances in which probationers can be discharged. These include, among other things, the central government finding the probationer "ineligible for recruitment" or "unsuitable to be a member of" the service; the probationer "wilfully" neglecting her probationary studies or duties; and the probationer lacking in "qualities of mind and character" needed for the service.

The Centre holds a summary enquiry before passing an order under these rules — like the one that has been initiated against Khedkar by the DoPT. The committee will submit its report within two weeks.



### Furnishing false information

Since the batch of 1995, 27% seats in the services have been reserved for the OBC category. The Physically Handicapped (PH) reservation was introduced with the batch of 2006 — 3% seats in every category (General, OBC, SC, and ST) are reserved for the differently abled.

Despite her low rank, Khedkar was allotted IAS, India's premier civil service, due to these quotas. However, if her OBC and PH certificates are proven to have been falsified, Khedkar stands to be discharged from service. Probationers are “discharged”, while confirmed officers are “dismissed”.

A DoPT circular from 1993 states: “Wherever it is found that a Government servant...had furnished false information or produced a false certificate in order to secure appointment, he should not be retained in service...”. This is applicable even if the person in question is not a probationer, and has already been confirmed.

However, such a dismissal would likely be challenged in court, before the Central Administrative Tribunal (CAT), and the National OBC Commission — challenges which may drag on for years. In the interim, the officer may still continue to be in service.

Khedkar was previously embroiled in a legal battle at the CAT regarding her PH status. As per a CAT order dated February 23, 2023, UPSC had asked Khedkar to undergo a medical examination at the AIIMS, New Delhi in April 2022 but she sought a postponement citing a Covid-19 infection.

She did not arrive at the rescheduled examination as well, although she is learnt to have later submitted an MRI report from a private facility to support her claims. “Despite making multiple attempts by the duty officer in AIIMS to contact the applicant, no response was received from her. Therefore the percentage of visual disability could not be assessed,” the CAT order read.

Critics have pointed to Khedkar's ostensibly well-to-do background to question her OBC (non-creamy layer) status. The OBC category is subdivided into the creamy and non-creamy layers, with only the latter benefiting from reservations in government services and institutions. The idea is to specifically benefit those OBC members who come from economically, socially, and educationally less privileged backgrounds. This determination is made based on the parents' income, and occupational background.

For those whose parents work in the private sector, the current threshold to qualify for the non-creamy layer status is an income of under Rs 8 lakh annually. For those with parents who work in the public sector, income is not taken into account. Rather, as per DoPT rules, what qualifies people to be in the creamy layer is either parent becoming a Group-A official before the age of 40, or both being Group-B officials with similar ranks.

Puja Khedkar's father, Dilip, is a retired Maharashtra Pollution Control Board officer, who is now in politics.

## ON THE JURISDICTION OF THE CBI

### The story so far:

The Supreme Court on July 10 upheld the maintainability of the West Bengal government's suit accusing the Union government of “constitutional overreach” by employing the Central Bureau of Investigation (CBI) to register and investigate cases in the State despite its withdrawal of general consent on November 16, 2018. A Bench comprising Justices B.R. Gavai and Sandeep Mehta

3<sup>RD</sup> FLOOR AND 4<sup>TH</sup> FLOOR SHATABDI TOWER, SAKCHI, JAMSHEDPUR



rejected the Centre's preliminary objections that it was wrongly made a defendant in the suit as it did not control the CBI, which was an "independent agency." Perusing various provisions of the Delhi Special Police Establishment (DSPE) Act, 1946, under which the CBI functions, the Bench concluded "the very establishment, exercise of powers, extension of jurisdiction, the superintendence of the DSPE [Act], all vest with the Government of India." Accordingly, the Court ruled that the suit discloses a valid cause of action and must be heard on merits. It posted the next hearing on August 13.

#### **What is general consent?**

Under Section 6 of the DSPE Act, the CBI is required to obtain consent from the concerned State government before initiating an investigation within its jurisdiction.

This permission is crucial since "police" and "public order" are subjects that fall within the State List under the seventh schedule of the Constitution. However, no such prior consent is necessary in Union territories or railway areas. General consent is given by States to facilitate the agency's seamless investigation into corruption charges against Central government employees in their territories. However, since 2015, several States such as Chhattisgarh, Jharkhand, Kerala, Mizoram, Punjab, Rajasthan, Telangana, Meghalaya and West Bengal have revoked their general consent alleging that the Centre is misusing the federal agency to unfairly target the Opposition. "In the absence of such an omnibus consent, the CBI will be unable to register any fresh cases in these States without the explicit permission of the respective State governments," P.D.T. Achary, former Secretary General, Lok Sabha told The Hindu.

#### **What does the case filed by the West Bengal government allege?**

In August 2021, the West Bengal government filed an original suit under Article 131 of the Constitution arguing that the actions of the Union government and the involvement of the CBI in the State infringed upon its sovereignty. The suit highlighted that despite the withdrawal of general consent for CBI investigations by the Trinamool Congress government on November 16, 2018, the agency proceeded to register 12 new cases. Deeming this to be a "constitutional overreach," the State sought the annulment of these 12 cases and a restraint on the agency from lodging any further cases.

The framers of the Constitution envisioned such conflicts between the Centre and the States owing to the existing quasi-federal structure and dual polity. As a result, they conferred original and exclusive jurisdiction upon the Supreme Court to address such disputes, under Article 131. For a suit to be maintainable under this provision, two conditions have to be satisfied — it should relate to a dispute between the Government of India and one or more State Governments (or) between one or more State Governments, and it must involve a question of law or fact crucial to the determination of legal rights.

In *State Of Karnataka vs Union Of India (1977)*, the Supreme Court observed that Article 131 is a feature of federalism and should be "widely and generously interpreted" to advance the intended remedy. Similarly, in *State Of Rajasthan & Ors. vs Union Of India (1977)*, the top Court cautioned against taking a very "restrictive or a hyper-technical view of the State's rights."

#### **What was the Union government's argument?**

Solicitor-General Tushar Mehta, appearing for the Union government, pressed the Court to dismiss West Bengal's suit by raising preliminary objections to its maintainability. He pointed out





that original suits under Article 131 of the Constitution exclusively involve the Union and States as parties. “It is the CBI which has registered the cases in question. But the CBI is not a defendant in this suit, and it cannot be made one, as the CBI is not a ‘State’ under Article 131,” Mr. Mehta contended.

He further argued that the CBI was an “independent agency” since it did not function under the direct control of the Union government. “The Union does not supervise the registration of offences or investigation or closure or filing of chargesheet or conviction or acquittal of cases by the CBI,” he reasoned. However, later in the proceedings, Mr. Mehta finally conceded that the agency cannot initiate any investigation without the express authorisation of the Union government under Section 5 of the DSPE Act.

On the contrary, senior advocate Kapil Sibal highlighted that the case extended beyond the Centre’s control over the CBI to the fundamental question of whether the agency could disregard a specific notification issued by the West Bengal government in 2018, withdrawing its consent. Mr. Sibal asserted that once a State grants and then withdraws its consent, the CBI lacks jurisdiction to exercise its powers within that State.

#### **What did the verdict state?**

The Court observed that a bare perusal of the provisions of the DSPE Act reveals that right from the constitution of the CBI, the classes of offences which are to be investigated by it, to its administration and powers, it is the “Central government that it is vitally concerned with.”

“Under Section 4 of the DSPE Act, except the offences under the Prevention of Corruption Act, in which the superintendence will be with the Central Vigilance Commission, the superintendence of the DSPE in all other matters would vest with the Central government,” Justice Gavai, who authored the verdict, noted. The judge also reminded the Centre that Section 6 of the DSPE Act mandates the prior consent of the State government to a CBI probe within its jurisdiction.

While the Court recognised that the CBI would always be entitled to investigate offences independently, it underscored that this autonomy “would not water down” its administrative control and superintendence that vests with the Centre. It thus proceeded to conclude that the Solicitor General’s argument that the CBI is an “independent agency” holds no water.

The verdict, however, clarified that these observations were only made to meet the preliminary objections raised by the Union government and would not have any bearing on the merits of the suit.

#### **What are the implications?**

According to Mr. Achary, if the CBI is permitted to initiate investigations in States that have revoked their general consent, it would be an affront to federalism. “This could strain Centre-State relations, particularly since the police is a State subject under the Constitution. Allowing the CBI to register cases would effectively confer upon it the same powers as the State police forces,” he adds. While the Supreme Court has so far only addressed the preliminary objections to the maintainability of West Bengal’s suit, the constitutional expert pointed out that the final ruling on its merits will have a significant bearing on other similar pending cases.

Another Bench of the top Court is tackling a similar question of law related to the State of Tamil Nadu in the case of Ankit Tiwari, an Enforcement Directorate (ED) officer against whom the Tamil Nadu Directorate of Vigilance and Anti-Corruption had launched a criminal prosecution for



bribery. A Bench of Justices Surya Kant and K.V. Viswanathan had recommended judicial oversight over the cross-fire of criminal cases filed between Central agencies like the ED and the police in Opposition-ruled States to protect innocents from prosecution.

#### QUESTIONABLE INTENT

The Bill tabled by the Maharashtra government to tackle unlawful activities by organisations linked to left-wing extremism is unnecessary, and perhaps even unconstitutional. When existing laws seem adequate to tackle extremism, and the area affected by left-wing extremism is limited in the State, the only reason such a proposal has been made could be an oblique intent to crack down on lawyers, dissenters and human rights activists involved in taking up the cause of the marginalised. The Bill may fall foul of constitutional provisions, as it contains overbroad terms that may cover individuals and organisations that may pose no threat to public order. The core of the proposed law appears to be the questionable term ‘urban Naxal’, even though the phrase itself does not find a place in the Maharashtra Special Public Security Bill, 2024. The Statement of Objects and Reasons talks about ‘safe-houses’ and ‘urban dens’ of the Maoist network in cities. It claims that existing laws are inadequate and that Naxal frontal organisations are active in the absence of a special law. Given that several provisions in the State’s Bill are already found in the central law, the Unlawful Activities (Prevention) Act, it is indeed a strange claim.

The most serious provisions that allow for declaring organisations unlawful and make it an offence to be a member of or in any manner assisting or participating in meetings of such organisations are too widely worded. An organisation, for instance, can be any group or body of persons whether or not known by any name or registration. ‘Unlawful activity’ includes not only words or actions that threaten public order but also anything that interferes with the administration of law or with its institutions and personnel. In effect, this may cover any organised protest. It not only includes promoting violence and the use of firearms or explosives but also “encouraging or preaching disobedience to established law and its institutions”. This may be interpreted to include protests against or even condemnation of police excess, custodial violence or any miscarriage of justice. While committing an unlawful activity may entail a jail term of up to seven years, even one who is not a member of an unlawful organisation can be jailed for two years on the charge of soliciting aid for it or three years for promoting a meeting of the organisation. The most draconian provisions are the ones empowering the government to seize any house or building where unlawful activities take place, evict its occupants and take over its money and assets. The Bill is expected to lapse as the current Assembly may have already held its last session before elections later this year, but the questionable intent may survive into future regimes too.

#### SDG INDIA INDEX 2023-24

The fourth edition of the Sustainable Development Goals (SDG) India Index has been published by NITI Aayog. The first index was published in 2018.

It computes goal-wise scores on the 16 SDGs for each State and UT. These scores range between 0–100, and if a State/UT achieves a score of 100, it signifies it has achieved the targets.

The higher the score of a State/UT, the greater the distance covered to the target.

The composite score for India improved from 57 in 2018 to 66 in 2020-21 to further to 71 in 2023-24.



Kerala and Uttarakhand as the best-performing states with a score of 79 points each.

Bihar is at the bottom of the index with 57 points, followed by Jharkhand at 62 points.

## INEQUALITY RUNS THROUGH IT

Consider the following statistics about a minority group relative to the average of a country. One, the median years of completed schooling of a male household head belonging to this group is almost two years lower. Second, its urban infant mortality rate is almost 5 per cent higher than the average for the entire urban population. Third, a higher percentage of children under five years of age from this minority group are malnourished than the average under-five-year-old in this country. These are statistics for Muslims in India from the most recent 2019-21 round of the National Family Health Survey.

— These gaps in human development indicators between an Indian Muslim and an average Indian household have been mostly stagnant and persistent over decades.

— Residential segregation of Muslims in India is symptomatic of their low levels of socio-economic development.

— Segregation not only makes minority communities easier targets during communal violence, it has strong negative implications for access to public goods and services... Not only do cities with larger Muslims populations have worse access to public health and education, but within cities too, the segregation of Muslim neighbourhoods results in lower consumption of public goods by this minority group.

— First, the importance of education as a precursor to accessing good and decent work opportunities cannot be emphasised enough. If access to good schools and educational institutions is limited due to segregation of Muslims, they are handicapped even when it comes to applying for good job opportunities.

— Second, it is well-acknowledged that women's education is strongly, negatively correlated with fertility rates. Not only does the overall educational attainment of Muslims fall dramatically at the tertiary level, the gender gap in educational attainment within the Muslim community is larger.

— The residential segregation of Muslims and the resultant constraints on their accessing quality education and health services are accompanied by shockingly low representation of Muslims in positions of influence, relative to their population.

— The Sachar Report noted that Muslims have constituted merely 3-6 per cent of IAS and IPS officers, district judges or judicial officers for decades. Invisibility in the public sector occurs alongside inadequate political representation relative to the size of the Muslim population

— While more data on the granular aspects of the lives of disadvantaged groups in India is urgently needed, our policies should include economic status as a criterion for receiving state benefits.

— Affirmative action policies in employment and education, besides housing, that account for economic disadvantage (that is, through the EWS category) can address systemic and deep-rooted cultural biases against disadvantaged groups.



## THE SC RULING ON PORTRAYAL OF DISABILITY IN FILMS

### The story so far:

On July 8, while hearing a plea to ban the film *Aaankh Micholi* for derogatory portrayal of people with disabilities, the Supreme Court in a landmark ruling laid down comprehensive guidelines to prevent stereotyping and discrimination of persons with disabilities (PwDs) in visual media, including films and documentaries.

### What is the framework?

The Supreme Court's framework focuses on the prevention of stigmatisation and discrimination, recognising their profound impact on the dignity and identity of persons with disabilities. Among the guidelines is a call to avoid words that cultivate institutional discrimination, such as "cripple" and "spastic," as they contribute to negative self-image and perpetuate discriminatory attitudes. A Bench headed by the Chief Justice of India D.Y. Chandrachud said stereotyping differently abled persons in visual media and films must end, asking creators to provide an accurate representation of disabilities rather than mocking them. Language that individualises the impairment and overlooks disabling social barriers, for example, words like "afflicted," "suffering" and "victim", should be avoided, it said. The court also asked creators to practice the principle of "nothing about us, without us," and involve persons with disabilities in the creation and assessment of visual media content.

### What are laws which grant disability rights?

The law which comprehensively deals with disability rights is the Rights of Persons with Disabilities (RPwD) Act which came into force from April 19, 2017. It replaced the Persons with Disabilities (Equal Opportunities, Protection of Rights and Full Participation) Act, 1995. The National Trust Act (1999), Rehabilitation Council of India Act (1992), Mental Health Care Act (2017) are the other laws that govern disability rights.

According to Shashank Pandey, a lawyer based out of Delhi and a founder of the Politics and Disability Forum, there are broadly two models under which disability rights are looked at, namely medical and social models. The human rights model, which is a recent one, is an evolution of the social model which says that people with disability are a part of society and have the same rights as everyone else. The Supreme Court's emphasis on the human rights model is significant as it makes the government and private parties obliged to facilitate full and effective participation of persons with disabilities in society. The advantage is that it places individuals in a sphere where all human rights principles which are applicable to anyone can be claimed by the disabled populace. The disadvantage is that it is an abstract idea and difficult to implement, says Mr. Pandey. The framework is also limited, as it is only for visual media, he adds, pointing out that the guidelines could have been sent by the SC to all departments for sensitisation.

V. Muralidharan of the National Platform for the Rights of the Disabled welcomed the ruling, adding that the framework has stressed on the guidelines which were in place in the 2016 legislation. He rues the fact that the law is not being implemented properly. "However, we cannot lose sight of the conditions prevailing in the country. Disabled people are still considered objects of charity. Even the government's coinage of 'Divyang' looks at disability through the lens of charity. It is regressive and reinforces a patronising mindset. Also, the usage of words like 'pappu'



and ‘balak budhi’ by the ruling party to paint its opponents in a poor light only shows how big the battle is,” he points out.

#### **What about creative freedom?**

Cinematic expression doesn’t have absolute power when it operates in the context of marginalised communities. It has to be looked at from the overall context of the expression and intent behind the expression. The Supreme Court said “the creative freedom of the filmmaker cannot include the freedom to lampoon, stereotype, misrepresent or disparage those already marginalised”. In determining these aspects, the “intention” and “overall message” of the film have to be considered.

#### **What is the way forward?**

The court emphasised on collaboration with disability advocacy groups to gain invaluable insights and guidance on respectful and accurate portrayals, ensuring the content aligns with the lived experiences of persons with disabilities. It has also said that implementing training programmes for writers, directors, producers, and actors to emphasise the impact of portrayals on public perceptions and the lived experiences of persons with disabilities is a necessity.

### **DISABLING THE DISABLED**

Imagine being taxed each time you went for a walk, to print a document, or for simply having your limbs intact. This is precisely the manifest injustice being faced by millions of disabled Indians... For the last seven years, since its (GST) enactment, disabled individuals who rely upon prosthetic limbs, Braille and wheelchairs must compulsorily pay an additional five per cent tax on these essential mobility aids.

— The Supreme Court has had numerous occasions to test the constitutionality of a tax levied by the government in landmark cases such as Sakal Papers (1961), Indian Express (1984), and more recently, Aashirwad Films (2007). Our judges have consistently struck down any tax, cess or duty, which have had the effect of even indirectly curtailing a fundamental right.

— In Sakal Papers, the Supreme Court struck down the government-imposed restrictions on advertising in newspapers as being violative of free expression — noting that reduced advertising would lower the circulation of the newspaper thus impacting the citizen’s fundamental right to free speech and expression under Article 19(1)(a).

— Similarly in Indian Express, a case which came 23 years after Sakal Papers, the Supreme Court while striking down the customs duty imposed on newsprint, termed such a levy as being a “burden imposed on the common man for being literate and for being conscious of his duty as a citizen to inform himself about the world around him.”

— The tax imposed on disability aids is no different. It has the effect of perpetuating negative stereotypes against those who are disabled by expressly penalising their disability as against their able-bodied counterparts who bear no such tax burden for performing the most basic of tasks — walking and reading.

— In fact, the government enacted the Rights of Persons with Disability Act in 2016, which, under Section 3, specifically prohibits discrimination against persons with disability.



— Even though the GST revenue collected from disability aids is minuscule as compared to the total figure, the issue is one of dignity for the disabled and by taxing them for something as basic as movement and reading, we send them a message not of empowerment but of inferiority.

— The Rights of Persons with Disabilities Act, 2016 gave effect to the United Nations Convention on the Rights of Persons with Disabilities. The convention was adopted by the UN General Assembly in December 2006, and entered into force in 2008. India ratified the convention in 2007.

— The 2016 Act, which repealed and replaced The Persons with Disabilities (Equal Opportunity, Protection of Rights and Full Participation) Act, 1995, commenced in April 2017. It mandated the central government to notify guidelines and standards for public buildings, and to review them “from time to time” based “on the latest scientific knowledge and technology”.

— The first set of guidelines — the Harmonised Guidelines and Space Standards for Barrier Free Built Environment for Persons With Disability and Elderly Persons — was published in March 2016.

#### PRESIDENT RETURNS PUNJAB BILL SEEKING REMOVAL OF GOVERNOR AS CHANCELLOR

President Droupadi Murmu has refused to clear a Punjab government Bill seeking the removal of Governor Banwarilal Purohit as the Chancellor of state-run universities. The state government has now decided to seek legal option.

— The Bill, sent to the President in December, was recently returned to the Punjab Raj Bhavan. Following a November 10 Supreme Court ruling that “governors cannot sit on state Bills”, Purohit had reserved three pending Bills — The Punjab Universities Laws (Amendment) Bill, 2023, The Sikh Gurudwaras (Amendment) Bill, 2023 and The Punjab Police (Amendment) Bill, 2023 — for the President’s consideration. The other two Bills are still with the President.

— According to government sources, the Punjab Universities Laws (Amendment) Bill, 2023 was passed by the Assembly as Purohit, Vice Chancellors of state universities, was not clearing the appointments of several experts, stating he was the Chancellor of these universities. But Purohit sent the three Bills to the President in December last year, a month after the SC ruling.

— “The Governor cannot be at liberty to keep the Bill pending indefinitely without taking any action whatsoever. Failing to make a decision and keeping a duly passed Bill pending for indeterminate periods is a course of action inconsistent with that expression,” said a Supreme Court bench comprising Chief Justice of India DY Chandrachud.

#### PUBLISH CENTRE-WISE NEET-UG RESULTS BY TOMORROW: SC TO NTA

A three-judge Bench headed by Chief Justice of India D.Y. Chandrachud ordered the NTA, which conducts the NEET annually, to mask the identities of the students while releasing the results from each centre. A reason for releasing the results centre-wise is to check if the perfect 720/720 scores were clustered in any particular exam centres, leading to suspicions of foul play, including question paper leaks and cheating.

While the petitioners claim that an unprecedented 67 students, including multiple candidates from the same exam centres, had achieved perfect scores in 2024, the NTA which dismissed allegations of “mass malpractice” or paper leaks, maintained that only 17 candidates had scored 720/720 this year.



The publication of the complete results would help, by following the patterns of marks in every NEET centre, to examine if the leaks had spread across the country like “wildfire” tainting the entire exam, requiring a re-test.

Solicitor-General Tushar Mehta, for the Centre, objected to the publishing of the entire results, saying they were the “personal property” of students. So far, the Centre and the National Testing Agency have released the results of the top 100 NEET-UG scorers.

Senior advocate Narender Hooda, leading the petitioners’ side, said there was no reason for either the Centre or the NTA to “shy away” from publishing the results centre-wise as long as the students’ identities were not disclosed.

Publication of the entire results would help the petitioners to scour centre- or city-wise scores to track down inordinate concentrations of perfect scorers, if any, Mr. Hooda argued.

Agreeing, the court initially gave NTA 24 hours, that is by 5 p.m. on Friday, to upload the results. However, it later relented to extend the deadline to Saturday at noon on a request by NTA counsel, senior advocate Naresh Kaushik.

The Bench, also comprising Justices J.B. Pardiwala and Manoj Misra, scheduled the next hearing on July 22. The court did not pass a positive order on an oral plea by the petitioners, many of them students, to suspend the counselling process. Mr. Mehta informed that the counselling process was scheduled to start on July 24.

Chief Justice Chandrachud said the Bench would hear the case first on July 22 and may, in all eventuality, wrap it up by the afternoon.

The hearing saw Mr. Hooda argue that the data analytics test done by the Indian Institute of Technology-Madras to detect malpractice was faulty. He said it had spread its study too thin by trying to analyse the data of all 23.33 lakh candidates who appeared in the NEET-UG rather than focus on the first 1.08 lakh whose medical admissions in government and private colleges were a sure shot. The petitioners also said IIT-Madras was on the governing body of the NTA, which pointed to a conflict of interest.

The court responded to Mr. Hooda’s submission by asking the NTA to find out how many students who changed their cities/centres made it to the first 1.08 lakh and if there was any “skew” in favour of the students who changed their cities. The publication of the entire results, Mr. Hooda said, would aid the petitioners to also pitch in and cull out this piece of information.

Chief Justice Chandrachud said it was an admitted fact that paper leaks happened in Patna and Hazaribagh in Bihar. Both cases are being investigated by the CBI presently. But the court asked the CBI to produce on record the earlier investigation records of the Bihar Police and the State Economics Offences Unit on Monday.

The Chief Justice said he did not believe that somebody had leaked the question papers to “make a national charade of the NEET”. “People do this to make money. Anybody wanting to make money would not be able to do so without a massive network,” Chief Justice Chandrachud said.

Mr. Hooda referred to the “shoddy” security which was in place in Hazaribagh. He said the NEET papers were taken to the exam centre by an e-rickshaw on May 5.



The Chief Justice drew two separate hypotheses about the leaks. One, the paper was leaked before the banks took custody of them on May 3. The other, the leaks happened when the question papers were taken from the banks to the exam centres on May 5.

“The court’s worry is how much was the time period between the breach and the exam. The more the time, the wider the leak,” Chief Justice Chandrachud observed.

Mr. Mehta said the “breach” happened in Hazaribagh on May 5, the exam day, between 8 a.m. and 9.20 a.m. Referring to CBI probe findings, he said the leak was local. Parents had paid the gang in post-dated cheques. Their children were called in and told to memorise the answers.

The Solicitor-General ruled out any massive dissemination of the leaked paper. “That would have led to the cancellation of the exam. So, the gang wanted the leak to remain small,” he said.

### WHAT IS PM SHRI, THE ‘SHOWCASE’ SCHOOLS SCHEME THAT CENTRE IS PUSHING IN STATES?

The Centre has stopped funding for the umbrella program for school education in three opposition-ruled states that have refused to implement its PM SHRI scheme. The Samagra Shiksha Scheme, for which funding has been stopped in West Bengal, Punjab, and Delhi, supports implementation of the Right of Children to Free and Compulsory Education (RTE) Act, 2009.

Samagra Shiksha funds for the third and fourth quarters of 2023-24 and the first quarter of 2024-25, amounting to Rs 330 crore, Rs 515 crore, and Rs 1,000 crore for Delhi, Punjab and West Bengal respectively, have not been released.

While the Education Ministry has given no official explanation, a senior official told The Indian Express that states cannot receive Samagra Shiksha funds without implementing PM SHRI (PM Schools for Rising India), which is part of the program.

#### **PM SHRI scheme**

The scheme, approved in 2022, seeks to develop 14,500 schools to “showcase” the National Education Policy (NEP), 2020, and be “exemplars” for other schools in their region. The scheme is for existing elementary, secondary, and senior secondary schools run by the central government and state and local governments around the country.

The PM SHRI dashboard online currently lists 10,077 schools, of which 839 are Kendriya Vidyalayas and 599 Navodaya Vidyalayas, both run by the Centre. The remaining 8,639 schools are run by state or local governments.

The Centre had declared a total project cost of Rs 27,360 crore for five years until 2026-27, of which the Centre would bear Rs 18,128 crore. At the end of the five-year period, states and Union Territories (UTs) would be required to “continue to maintain the benchmarks achieved by these schools”.

The government told Lok Sabha in February that Rs 3,395.16 crore had been approved for 6,207 PM SHRI schools for 2023-24, of which the Centre’s share was Rs 2,520.46 crore and that of the states Rs 874.70 crore.





### Selection of schools

UP has the most PM SHRI schools (1,865) followed by Maharashtra (910) and Andhra Pradesh (900). No state or local government-run schools in the non-BJP states of Punjab, Delhi, Tamil Nadu, Kerala, West Bengal, and Bihar, as well as Odisha, which got a BJP government only last month, have been included in the scheme.

PM SHRI schools are selected through the “challenge mode” — schools that meet certain minimum benchmarks (including a pucca building in good condition, barrier-free access ramps, at least one toilet each for boys and girls) can apply online.

They are evaluated on a set of parameters that include infrastructure, teaching staff, and learning outcomes. Schools in urban areas must score at least 70%; those in rural areas 60% to be selected. States are supposed to send a list of recommended schools to the Ministry, and an expert committee headed by the School Education and Literacy Secretary draws up the final list. Up to two schools — an elementary school and a secondary/ senior secondary school can be selected per block/ urban local body.

The state, UT, or Kendriya Vidyalaya Sangathan/ Navodaya Vidyalaya Samiti is required to sign a Memorandum of Understanding (MoU) with the Ministry of Education committing to implement the provisions of the NEP “in entirety within the entire State/ UT”, and to prefix PM SHRI to the name of the selected school.

States/ UTs have to work to ensure zero dropout rates in all grades within two years of implementation, comply with norms for pupil-teacher ratio, and implement “innovative pedagogy” such as activity-based, sports-based, art-based, and toy-based learning.

### Samagra Shiksha

The PM SHRI scheme is to be implemented at the state/ UT level through the existing administrative structure available for Samagra Shiksha, which the government describes as “an overarching program for the school education sector...from pre-school to Class 12..., prepared with the broader goal of improving school effectiveness measured in terms of equal opportunities for schooling and equitable learning outcomes”.

Samagra Shiksha, which was proposed by the Union Budget of 2018-19, subsumed the erstwhile Sarva Shiksha Abhiyan (SSA), Rashtriya Madhyamik Shiksha Abhiyan (RMSA), and Teacher Education (TE) schemes.

The scheme is funded in a 60:40 ratio by the Centre and states, barring the 11 Northeastern and Himalayan states, which have to bear only 10% of the cost.

### Three outlier states

Delhi and Punjab have declined to participate in PM SHRI because the Aam Aadmi Party governments in these states are already implementing similar schemes for exemplar schools called “Schools of Specialised Excellence” and “Schools of Eminence” respectively. West Bengal has objected to the requirement of prefixing PM SHRI to the names of the schools, especially since the state bears 40% of the cost.



The states that have not signed the PM SHRI MoU have not received funds from the Centre under the Samagra Shiksha scheme. After holding out initially, Kerala, Bihar, Tamil Nadu, and Odisha agreed to participate in the scheme in March this year.

### DISSENTING DU PROFESSORS SAY HINDU STUDIES SYLLABUS FOCUSES ON 'BRAHMANICAL TEXTS'

The Centre for Hindu Studies, established last year, started its first MA batch in November 2023. Until now, the Centre was teaching Hindu Studies as per the University Grants Commission-National Eligibility Test (UGC-NET) syllabus. Prerna Malhotra, Joint Director of the Centre, said, "We were following the UGC-NET syllabus so far. But since it is a two-year MA course, more papers needed to be added. A committee was formed to draft the new papers."

#### 'Passed unanimously'

Nine teachers wrote in their dissent note that the "Brahmanical texts" were "prominently featured" while "heterodox texts" have been inserted only in a tokenistic manner.

It added that other Indic traditions such as Sramanism, Charvaka, Jainism, Buddhism, and tribal traditions were not included in the syllabus.

Ms. Malhotra said there was, however, no dissent in the Academic Council meeting and it was passed unanimously. "Moreover, after the course was drafted, it went through multiple rounds of suggestions such as in the governing body meeting, which comprised several scholars and experts, and the Standing Committee for Academic Matters meeting... we had incorporated all these suggestions," she said.

The amended syllabus includes proposed electives such as 'An Introduction to Vedic Literature', 'Upanishad Parichaya', 'Dharma and Religion', 'Bhagavad Gita for Humanity', and 'Hindu Thinkers'. The paper on 'Hindu Thinkers' includes thinkers such as Ramanujacharya, Dayananda Saraswati, Swami Vivekanand, Sri Aurobindo, Bal Gangadhar Tilak and Vinayak Damodar Savarkar.

The statement by the dissenting teachers said that works of renowned scholars such as Debiprasad Chattopadhyaya and Daya Krishna have not been included.

"Further, Ambedkar's important work on Hinduism — Riddles in Hinduism — is conspicuous by its absence," added the statement.

Professor Maya John, one of the dissenting members, said, "The reading list represents only a certain tradition of scholarship on Hinduism, while heterodox positions such as Marxist, feminist, Periyarist, Ambedkarite etc., are sadly absent... The readings are not as expansive, and a critical component is missing. So, it would not provide scholars with the perspective that they need."

### WHICH TOPICS ARE INDIA'S RESEARCHERS PUBLISHING PAPERS ON?

Research publications are widely used as a measure of scientific and technological progress. Analysing trends in research also helps guide policy. A brief comparative study of the most researched topics in the Web of Science, a scholarly publication database, over the last 20 years and the last five years highlights the research focus of scientists in different countries.



### The chart-topper

'Coronavirus' was the most published research topic in the world in the last five years and in the last two decades. The sheer volume of papers on this subject shows the capacity of the global scientific community to produce relevant scientific knowledge that will help people respond quickly to a crisis.

'Coronavirus' was the most researched topic in India in the last five years and among the top five research topics in the last two decades. It was the most published research topic in the U.S. over the last five years and in the last two decades. But it was conspicuously absent from China's top research topics. This is surprising for two reasons: the SARS-CoV-2 virus was first reported from this country in late 2019; and China, which has emerged as a global scientific superpower in the last two decades, has been contributing an increasing share of the world's papers on several research topics.

Some of the other topics that are widely researched are deep learning, and clean and green energy topics such as photocatalysis, supercapacitors, and oxygen reduction reactions. Deep learning refers to a class of artificial intelligence (AI) algorithms characterised by the use of multiple 'layers', where each layer transforms and/or manipulates the input data in specific ways. Engineers have built facial recognition on phones, speech recognition in digital assistants, and recommendation engines on streaming services using deep learning.

The focus on AI-related research worldwide corresponds to the increasing importance of AI technologies in various sectors. Chinese researchers have produced more than twice as many papers on the topic of AI as have researchers in the U.S., and more than 45% of the world's research output on this subject in the last five years. India's share remains low even if the topic features among the country's top five.

Photocatalysis refers to the acceleration of chemical reactions using light. Scientists are studying it to make new materials and generate clean energy; a particularly important contemporary focus area is green hydrogen. Supercapacitors are energy storage devices that trap and hold energy as electrostatic charge. In contrast, conventional batteries store chemical energy. Supercapacitors are super-powered batteries that can store much more energy and also release it faster. Their applications include electric vehicles, where fast charging is required, and the renewable energy sector. The oxygen reduction reaction is an important process in electrochemistry with a starring role in next-generation energy conversion devices such as fuel cells and metal-air batteries. Research on these topics is evidently driven by researchers in China.

### Comparing the U.S. and China

Overall, China has focused significantly on high-impact technological fields and on the development of new materials. In contrast, the U.S. appears to be facilitating a more diverse approach, addressing health and social well-being through research on topics such as parenting, the human immuno-deficiency virus, the SARS-CoV-2 virus, gut microbiota, and programmed cell death (PD-1). Research on PD-1 has the potential to revolutionise how we treat cancer and other diseases by understanding, and then manipulating, the immune system's response. The U.S. National Institute of Health provides more funding for life science and health research than all other civilian research funding agencies of the country. U.S. researchers are also devoting attention to astronomy and astrophysics, presumably because they enjoy greater access to the data produced by NASA missions.



### India's nano focus

The single largest fraction of India's research output is focused on nanotechnology. In particular, nanofluids have applications in heat transfer; silver nanoparticles have applications in antimicrobial and anticancer therapy; and zinc oxide nanoparticles are essential semiconductor materials with applications in electronics, optoelectronics, ceramics, and cosmetics.

The large volume of papers about nanotechnology can be attributed at least in part to the success of the Nano Mission that the Indian government launched in 2007 with the aim of making the country a top research destination on this topic. Other research focus areas are deep learning, photocatalysis, and coronavirus.

India's significant focus on nanotechnology is a sign of a concentrated allocation of resources in areas that may not directly address the immediate needs in health or climate change — at least not yet. Policymakers may examine the agenda-setting process in Indian research or, alternatively, guide nanotechnology towards solutions more closely related to India's Sustainable Development Goals and energy-transition targets.

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### TWO STEALTH FRIGATES BEING BUILT IN RUSSIA SET TO BE DELIVERED SOON

After a series of delays, two stealth frigates under construction in Russia for the Indian Navy are set to be delivered from September. Construction and deliveries were delayed due to COVID-19, the war in Ukraine and Western sanctions.

"First ship Tushil is ready for acceptance by the Indian Navy and is scheduled to be delivered by September. The commissioning crew reached Russia earlier this month," a defence official in the know said. "The second ship Tamal is expected to be delivered by February 2025."

#### Agreement for frigates

In October 2016, India and Russia signed an inter-governmental agreement for the four stealth frigates, two directly imported and two to be manufactured by Goa Shipyard Ltd. (GSL).

A \$1-billion deal was subsequently signed for the two frigates under direct purchase. In November 2018, the GSL signed a \$500-million deal with Rosoboronexport of Russia for material, design and specialist assistance to locally manufacture the two frigates, and in January 2019, the contract was signed between the Indian Defence Ministry and the GSL. All the ships are powered by engines from Zorya-Mashproekt of Ukraine.

#### Schedule to be followed

As per schedule, the GSL is scheduled to deliver the first ship in 2026 and the second one six months later. "Construction at GSL is progressing and the launch of the first ship would take place in the next couple of months," a defence source said. The basic structures of two frigates in Russia were lying at the Yantar shipyard in Russia which are now being finished. The Indian Navy already operates six of these frigates weighing around 4,000 tonnes each.



## ICAR, ON THE SIDELINES OF ITS 96TH FOUNDATION DAY AND TECHNOLOGY DAY IN NEW DELHI ON MONDAY

The Indian Council of Agricultural Research (ICAR) will launch its “one scientist, one product” programme on Tuesday to improve research in the field of agriculture and animal husbandry.

The council will formally announce the release of 323 varieties of 56 crops, including cereals, oilseeds, forage crops, and sugar cane, at a function here on Tuesday as part of its 96th foundation day.

These crops include 289 climate-resilient varieties and 27 bio-fortified varieties.

The “one scientist, one product” programme will be inaugurated by Union Agriculture Minister Shivraj Singh Chouhan.

### Five-year plan

Explaining the programme, ICAR Director-General Himanshu Pathak told presspersons here on Monday that the ICAR had given a target to all 5,521 scientists under the institution to come up with a product, technology, model, concept or good publication. At the beginning of every year, the scientist or a group of scientists will have to identify the product, and the ICAR will map the work. “We will monitor it at the institute level every three months and at the headquarters level every six months. This is a long plan,” he said. The scheme will work for five years.

“This year, we are prioritising seed hubs for high-yielding oilseeds and pulses varieties,” he said.

Dr. Pathak said the ICAR was also working to develop 100 new seed varieties and 100 farm technologies in 100 days as part of the Centre’s 100-day action plan. He said the council would request Prime Minister Narendra Modi’s time to launch these programmes by mid-September.

### Production boost

The ICAR said in a release that with the help of breeder seeds, about 16 million hectares (mha) are under bio-fortified varieties of different crops, including wheat (13 mha), rice (0.5 mha), pearl millet (1.5 mha), lentil (0.5 mha) and mustard (1 mha) during 2023-24. “Deployment of climate-resilient technologies led to enhanced production even during the abnormal years,” the ICAR said.

It said that from 2014-15 to 2023-24, a total of 2,593 high-yielding varieties were released.

These include 2,177 climate-resilient (83% of total) varieties with biotic and abiotic stress resistance, and 150 bio-fortified crop varieties.

## MAX TAKE OFF WEIGHT (MTOW) UNMANNED AERIAL VEHICLE (UAV)

The NewSpace Research and Technologies has claimed to have successfully tested a 100-kg MTOW UAV at an altitude of 19,024 feet at Ladakh’s Umling La pass.

Umling La pass is the highest motorable pass in the world.

MTOW includes the weight of the drone and the payload.

(Please Note: A Cheetah helicopter can transport a load of approximately 25-75 kg at a similar altitude, albeit at a significantly higher cost. This advancement is crucial given the escalating

**3<sup>RD</sup> FLOOR AND 4<sup>TH</sup> FLOOR SHATABDI TOWER, SAKCHI, JAMSHEDPUR**



tensions with China and Pakistan. Such advancements highlight the important role of the private sector in enhancing India's security preparedness.)

### ISRO HAS A PROBLEM: MANY ROCKETS, BUT TOO FEW SATELLITES TO LAUNCH

In June, S. Somanath, Chairman of the Indian Space Research Organisation (ISRO) and Secretary of the Department of Space, said ISRO's launch vehicle capability was three-times the demand. Many experts in the spaceflight sector and beyond interpreted this to mean the space launch market was grim. Mr. Somanath also suggested strong demand was needed for launch vehicles from the domestic Indian market.

India currently has four launch vehicles: the Small Satellite Launch Vehicle (SSLV), the Polar Satellite Launch Vehicle (PSLV), the Geosynchronous Satellite Launch Vehicle (GSLV), and the Launch Vehicle Mark-III (LVM-3). These rockets can launch satellites weighing up to four tonnes to the geosynchronous orbit. India also relies on foreign launch vehicles, like Europe's Ariane V and SpaceX's Falcon 9, when a satellite weighs more than four tonnes.

At present, the country operates a fleet of satellites with applications in communications, remote sensing, positioning, navigation and timing (PNT), meteorology, disaster management, space-based internet, scientific missions, and experimental missions. It also needs launch vehicles for space missions like Chandrayaan 3 and Aditya L1.

All this makes it look like there are more applications and satellites than there are launch vehicles — which is the opposite of what Mr. Somanath mentioned. Where then is the issue?

#### **Demand-driven model**

The Indian space programme used to follow a supply-driven model: ISRO would build and launch satellites and then look for customers who needed the services provided by the satellites. When the Indian government reformed the space sector in 2019-2020, it changed this to a demand-driven model. Here, a satellite needs to be built and launched only if there is already demand for it. This may have led to the situation Mr. Somanath mentioned.

There is now a chicken and egg problem. The customer of the services provided by the satellite needs to be educated about the need for the service. The customer will then create a demand for a service that will need a satellite to be launched. This will provide the demand Mr. Somanath is asking for.

Consider the example of the internet. There needs to be a demand for space-based internet in a country already filled with affordable fibre and mobile-based internet services, so a company will launch a constellation of satellites into orbit to provide that service.

#### **The question arises: Who will educate the customer, ISRO or the industry?**

Without such educated customers, demand at the scale ISRO expects will not be created. The customers here are not only consumers of space-based internet. These are other companies, government institutions, defence enterprises, and ordinary people including farmers, bankers, etc. So the 'amount' of education required is very great.

The other area from which demand is likely to arise is human spaceflight. This includes human-rated launch vehicles that carry humans and supplies into orbit and to destinations like an orbiting space station or the moon. There could in future be demand for space tourism as well.



### Launch capability limitations

India's launch vehicles are also not powerful enough to undertake certain missions, like Chandrayaan 4. China used its Long March 5 launch vehicle to launch its Chang'e 4 and Chang'e 5 missions in a single launch. India's LVM-3 has less than one-third of Long March 5's capability (28% to be more precise) and will need two LVM-3 launches to launch all the components of Chandrayaan 4.

ISRO will be upgrading the LVM-3 with a semi-cryogenic engine to boost its payload capacity to six tonnes to the geostationary transfer orbit (GTO). The organisation will also need a new launch vehicle — already dubbed the Next Generation Launch Vehicle (NGLV), a.k.a. Project Soorya — to carry 10 tonnes to GTO. But it has only submitted a funding proposal thus far for this project. Other variants of this launch vehicle are expected to raise this vehicle's lift capacity.

India will also need one more successful flight of the SSLV to be confident about its ability to launch smaller satellites. Smaller satellites are usually experimental and university-built. More success in this domain will encourage space companies to build larger satellites, eventually leading to a demand for launch vehicles.

### Launch vehicle economics

All these launch vehicles will need satellites to launch. The heavier vehicles can fulfil some national goals like lunar exploration and a space station while ISRO can use the smaller satellites for technology and capability demonstration. However, the latter will constitute only a small number of launches.

Satellites have a defined mission life. As they get old, they will need to be replaced with newer satellites. This will also create a demand for launch vehicles. However, mission operators like their satellites to live longer and have been improving their lifetimes with software and hardware upgrades. This complicates estimates of the number and frequency of launch vehicles that will be needed.

Launch vehicles are improving as well. In a single launch, the PSLV can deliver multiple satellites in multiple orbits. Rocket stages are becoming reusable, which reduces the cost of building the rocket and increases profitability. ISRO has been building its Reusable Launch Vehicle and vertical landing technologies to make reusable landing stages. It is also making an effort to replace toxic fuels for rocket engines with green alternatives.

### Private sector vs government

Mr. Somanath himself provided a solution for the problem he highlighted. He suggested we need an ecosystem that creates demand for various services, leading to a demand for data, leading to more sources of data (like satellites), culminating in a demand for launch vehicles. The richer the ecosystem, the greater the demand.

The Indian government wants the private sector to create demand among customers and to build and launch satellites. It wants them to look for services to offer customers in India and abroad. It also wants revenue by providing launch services of its own. Finally, the government wants to upskill workers and give them jobs.

However, private companies don't want the government to be in the launch business. Instead, they want the government to be their customer and to provide rule of law and reliable regulations.



This is because private players desire a reliable source of revenue, which the Indian government can be over a long period of time. There is thus talk of the government being an ‘anchor customer’ helping companies in their early days.

The roadmap here is for the government to exit the launch vehicle business at some point, leaving the companies with sufficient demand for launch vehicles. This is similar to the situation in the U.S., where arms of the U.S. government award contracts to SpaceX, Blue Origin, etc. to execute launches with their payloads.

Thus, the Indian government will absorb the cost of the transition from supply-driven to demand-driven building of satellites and launch vehicles. But it isn’t yet educating its own Ministries and creating some of the anchor demand for satellites and launch vehicles.

## NATIONAL QUANTUM MISSION: WHY INDIA HAS A LOT OF CATCHING UP TO DO

India launched the National Quantum Mission last year and became one of the few countries in the world to have a dedicated programme to harness the power of quantum technologies. These technologies, which use special properties of the tiniest particles of matter, can yield radical solutions to some of the most intractable problems of our age, such as clean energy and affordable healthcare.

But despite having a fairly strong research base in quantum science, India has a lot of catching up to do. A new report, surveying the existing capabilities of the country in this area, has found that countries like China and the United States have a huge head start over India. These countries have not just invested much more money in funding research, they also have more people working in this sector.

They have been publishing far greater numbers of scientific papers, and register many more patents as well.

But the good thing, as Indian science leaders have been emphasising, is that quantum technologies are still under development, and India is not exactly starting from zero. In fact, in some areas, Indian scientists are very much at the forefront of global research.

### **The quantum mission**

After several years of discussions, India in 2023 announced the setting up of the National Quantum Mission to build capabilities in quantum-related science and technology. The mission focuses on four key domains: computing, communications, sensors, and materials.

Quantum technologies try to make use of the fact that matter behaves in a very unexpected and counter-intuitive manner at its smallest scale. Sub-atomic particles such as electrons seemingly exist at multiple locations at the same time, and can influence the behaviour of a like-particle, with which they have had a prior interaction, over infinitely large distances.

These strange properties have been experimentally verified hundreds of times. However, it is only in recent years that scientists have acquired capabilities to put them to some beneficial uses. Some of these properties, like the ability to exist in multiple states at the same time — a phenomenon called superposition — can be used to perform real-life tasks that conventional technologies are unable to achieve.





Quantum computers are already a reality, though their capabilities are quite limited at this point. More mature quantum computers would be able to do calculations that would be either impossible for normal computers, or would take far too long to perform.

By overcoming the limits of current technologies, a quantum-enabled transformation can build the foundations of a new economy in a decade or two. This is why India wants to try and rapidly build its capabilities in these areas. Partnering in technology development would ensure early fruits of success, which can trigger rapid economic growth. It would also make leading technologies accessible to India.

#### **A lot of ground to cover**

The National Quantum Mission, however, is just the first step and there is a lot of ground to cover, according to the Landscape of Indian R&D in Quantum Technologies report. The report has been prepared by itihaasa Research and Digital, a not-for-profit company that seeks to study the evolution of technology and business in India.

The Rs 6,000 crore (around \$0.75 billion) earmarked for the mission is impressive by Indian standards but it pales in comparison to what other countries are spending on quantum-related research, the report said. China is estimated to be investing \$15 billion in this effort, while the US is pumping in about \$3.75 billion. The United Kingdom has put in about \$4.3 billion and countries like Germany, South Korea, and France have all committed to spend more than \$2 billion (see box alongside).

Researchers in China and the US have been producing the largest number of research papers. Between 2000 and 2018, Indian researchers published 1,711 papers on quantum-related science, according to one publicly available database, while Chinese and American researchers published 12,110 and 13,489 papers respectively. Seven other countries have published more papers than India during this period. Among the 10% most cited papers, the US and China again lead the way, and India ranks 20th, the report said.

China and the US are also garnering a lion's share of the patents being registered. Between 2015 and 2020, Chinese and American researchers acquired 23,335 and 8,935 quantum-related patents respectively. However, Indian researchers had only 339 such patents in the same period, according to a patent database. India was ranked ninth by the number of patents obtained.

The country was lagging on a few other parameters as well but had a foundation that could be built upon.

#### **Tough race but in competition**

The new report pointed out that between 110 and 145 senior scientists were currently leading research groups on quantum-related technologies in India. These groups supported 75-100 post-doctoral fellows, and about 400 PhD students. In addition, about 200 senior scientists were working in the related fields of material sciences, electronics, computer science, and physics.

The report also found that outside the European Union, India had the largest number of graduate students in disciplines aligned to quantum technologies. These include biochemistry, electronics, chemical engineering, statistics, and information and communication technologies. There were more than 82,000 such students enrolled, which is more than in China or the US.



### quantum India vs other countries in quantum technologies.

The report said the National Quantum Mission needed to identify and promote young talent. The mission could also raise a separate cadre of quantum scientists like the atomic energy or space science establishments had done, the report added.

Indian scientists are already at the forefront of research into quantum communications and quantum sensing, according to Abhay Karandikar, Secretary in the Department of Science and Technology. Even in areas such as computing and materials, the gap is not such that it cannot be bridged, he said.

### 60 µG/L URANIUM IN DRINKING WATER SAFE: NUCLEAR SAFETY WATCHDOG

A new study by Bhabha Atomic Research Centre (BARC) scientists concludes that uranium concentrations up to 60 µg/L in drinking water are safe, challenging the recent Indian standard of 30 µg/L.

- The previous Indian standard was 60 µg/L, set by the Atomic Energy Regulatory Board (AERB). In 2021, the Bureau of Indian Standards (BIS) lowered it to 30 µg/L, aligning with WHO guidelines.
- The BARC study argues that the stricter standard would increase purification costs without health benefits. It cites research, including WHO studies, suggesting no evidence of cancer risk from natural uranium levels in drinking water.
- Different countries have varying standards for uranium in drinking water, ranging from 15 µg/L to 350 µg/L, based on local factors.
- The researchers criticize BIS for not conducting health impact studies before adopting the new limit, unlike agencies such as the US EPA.
- A previous BARC study found that 98% of water samples in India had uranium levels below 60 µg/L, and 94% were below 30 µg/L.
- The study concludes that it would be prudent to maintain the AERB limit of 60 µg/L, considering the lack of evidence for health risks at this level and the potential socio-economic impacts of stricter standards.

### U-WIN, ALL WIN: A GAME CHANGER

Despite the challenges, India's Universal Immunisation Programme (UIP) is one of the major public health success stories, globally. With the government planning the launch of a digital vaccination registry, U-Win, on August 15, the UIP is poised to be placed on a much surer footing. The portal will steer the inoculation of 29 million pregnant women and 26 million infants annually against vaccine-preventable diseases. Under the current system, inoculation data is recorded manually by ASHA workers and then collated in state and national-level registries — this process usually takes more than a month. Immunisation at private healthcare facilities is often not recorded. U-Win will capture every vaccination event and ensure the availability of real-time vaccination data to healthcare policymakers. Such information flows could improve planning and lead to more responsive outbreak-averting interventions.



In 1978, India's first national immunisation programme against multiple diseases — then called the Expanded Programme for Immunisation — comprised four vaccines. The UIP today targets 12 diseases. NFHS data show that close to 80 per cent children in the 12-23 months age bracket have received the recommended vaccines. In recent years, however, surveys have flagged concerns. Routine immunisation services were disrupted during the Covid pandemic. The vaccination drive picked up in 2022. But, WHO-UNICEF data for last year indicate a minor dip in the percentage of children inoculated against diphtheria, pertussis and tetanus. Studies have also underlined that a section of India's migrant population gets left out of the UIP, or does not receive timely jabs. Another big challenge is to reduce the number of children who drop out from the vaccination programme. U-Win, which can be accessed from any geographical location, could be a game changer — it can improve vaccine coverage among disadvantaged groups, ultimately reducing infant mortality rates. Parents will get SMS alerts on the date for the next jab and they can book slots in advance anywhere in the country, without having to carry physical records. The authorities must, however, take care to ensure that India's digital divide does not come in the way of beneficiaries keeping their date with the vaccinator.

During Covid, the COWIN platform played a key role in vaccine delivery. Another portal, the e-Vin, has been tracking vaccine-related cold chain logistics since 2015 — it has ensured an 80 per cent reduction in instances of vaccine stock-outs. Now U-Win is slated to become the world's largest immunisation registry. The country's impressive suite of digital delivery systems should pave the way for making the UIP more expansive. There is a compelling case for including the HPV vaccine, for example, in the programme.

#### WHAT IS THE CHANDIPURA VIRUS (CHPV): KNOW THE SYMPTOMS, TREATMENT, PREVENTION, AND MORE

The toll in suspected cases of Chandipura Viral Encephalitis (CHPV) rose to 20 in Gujarat, including two deaths reported from Ahmedabad city. Additionally, 35 people showing symptoms of CHPV are admitted to various civil hospitals across districts.

In response to this outbreak, Gujarat Health Minister Rushikesh Patel has initiated preventive measures in the affected areas. Over 50,000 individuals have been screened, and all district and rural hospitals have been instructed to send samples of suspected cases to NIV for further testing.

Health officials anticipate a potential surge in cases in the coming days, as more confirmations are expected from NIV. Notably, this is not the first outbreak of the Chandipura virus in the country; there were outbreaks in 2003–04 in parts of central India, including Maharashtra, Gujarat, and Andhra Pradesh, that caused the deaths of over 300 children. Here's all you need to know about Chandipura Viral Encephalitis (CHPV).

#### **Chandipura virus (CHPV): What is it and how is it transmitted?**

CHPV is a virus that belongs to the Rhabdoviridae family, which includes rabies. It is transmitted by sandflies and mosquitoes, including *Aedes aegypti*, which is also a vector for dengue. The virus resides in the salivary glands of these insects and can be transmitted to humans or domestic animals through bites.

The infection can lead to encephalitis and inflammation of the brain's active tissues. The Chandipura virus, part of the Vesiculovirus genus, was discovered in 1965 in the blood of two individuals suffering from febrile sickness in a hamlet near Nagpur, Maharashtra.



The virus is spread by the female phlebotomine sandfly, which is abundant during the early monsoon season. *Sergentomyia* sandflies play a role in the virus's spread, with *Aedes aegypti* being highly susceptible and effective in laboratory conditions.

Chandipura infection produces encephalitis, which is the inflammation or swelling of brain tissue. However, no viral isolations from mosquitoes have been documented.

So far, the state government has reported 14 deaths due to suspected CHPV infection, including one confirmed from the Aravalli district; two other deaths were reported from Morbi, along with one each from Surendranagar and Rajkot.

#### **Chandipura virus (CHPV): Know the symptoms, impact, treatment and prevention**

Typical symptoms include a rapid onset of fever, vomiting, altered mental state, convulsions, diarrhoea, neurological deficits, and signs of meningeal irritation. The virus predominantly affects children under the age of 15, mostly in rural areas. Most affected children experience rapid deterioration, with deaths occurring within 48 hours of hospital admission. Enlisted below are some of the symptoms:

- Sudden fever onset
- Vomiting
- Changes in mental status
- Seizures
- Diarrhoea
- Impaired neurological function (e.g., difficulty speaking, loss of balance, vision changes)
- Meningeal irritation (evidenced by symptoms such as headaches, stiff neck, sensitivity to light, and seizures)

Currently, there is no specific antiviral treatment or vaccine available for the Chandipura virus. Early diagnosis and supportive care, such as managing airways, fluid balance, and the prevention of secondary bacterial infections, are essential for patient management.

Prevention strategies include vector control, identifying and eliminating sandfly breeding sites, and using protective measures to prevent sandfly bites, such as wearing protective clothing and using repellents and nets.

Environmental control, including proper waste disposal and sanitation, is also critical to preventing the spread of the virus. Public health authorities must take proactive measures to curb the spread of the virus and provide the necessary support and resources to the affected regions.

#### **WHAT IS CAUSING WIDESPREAD RAINFALL ACROSS INDIA?**

For the first time this season, the southwest monsoon is active over a large geographical area of India. At least 80% of the country last week reported widespread rainfall, with heavy to very heavy spells lashing Assam, West Bengal, Uttar Pradesh, Uttarakhand, Gujarat, coastal Maharashtra and Karnataka, Kerala, and Lakshadweep.



### **What factors are causing widespread rains?**

After remaining subdued during mid-June, the southwest monsoon got the much-required impetus towards June-end. The monsoon covered the entire country on July 2, six days ahead of its normal schedule. Delhi, Punjab, Uttarakhand, Uttar Pradesh, Himachal Pradesh, Rajasthan, and Jammu and Kashmir received the spell in early July.

However, since the start of this month, there have been multiple favourable weather systems that have kept the monsoon either active or vigorous (with respect to rainfall events) over southern peninsular, east, northeast, and central India regions.

There have been two main contributors to the enhanced rainfall. One is the continuous incoming of moisture-laden strong westerly winds from the Arabian Sea.

The other is the position of the monsoon trough — a semi-permanent, low-pressure area extending between Pakistan and the Bay of Bengal during the monsoon season — which usually oscillates between north and south within the season. Whenever it moves towards the south, as it has done in the present case, more rainfall can take place in central, eastern and peninsular India. When it shifts towards the north, the Himalayan foothills are likely to receive more rainfall but the rest of India sees a drop in rainfall.

Apart from these two factors, other weather systems have also contributed to the widespread rainfall over all regions, except the extreme north India. They are:

The persistence of an off-shore trough (a shallow trough of low pressure, which develops along India's coast during the monsoon) between south Gujarat and north Kerala for more than a week now.

The intermittent development of a wind shear zone — where winds move with different velocities and directions — along latitudes 20 ° N between central and peninsular India.

The development of a low pressure system over the west-central Bay of Bengal, off the Odisha coast, on Monday. The system moved over Chhattisgarh and adjoining Vidarbha on Tuesday, and over southeast Madhya Pradesh on Wednesday.

### **What is the rainfall status?**

The Met department's rainfall statistics indicate that the all-India rainfall went from 242mm on July 9 to 305.8mm on July 17. The country's rainfall stands at 97% of the normal for this time of the season.

Overall, 17 states have either received normal or above-normal rainfall this season. But there are a few states such as Odisha, Haryana, Chandigarh, Himachal Pradesh, and Jharkhand along with high-rainfall recording states including Kerala, Nagaland, Manipur, and Mizoram where the rainfall, this season, has been deficient, so far this season. This is also because July rainfall normal values for many of these states are high.

Since July 13, some heavy rainfall events have been recorded along the country's west coast, especially in Konkan, Goa, ghat areas of Madhya Maharashtra, coastal Karnataka, and Kerala. Uttarakhand, west Uttar Pradesh, Gujarat, and West Bengal also received heavy rainfall.



## IN THE NAME OF FLOOD CONTROL

Assam's geography is a product of various influences. These include the mighty eastern Himalaya, its fragile geology and forested landscape, the effect of the southwest monsoon... The months of July and August are infamous for the suffering it brings to the state's people and wildlife.

— A wide range of evidence suggests an increase in the intensity and impact of the annual floods after the Assam earthquake of 1950, recorded at a moment magnitude of 8.6.

— As early as 1950, Assam had asked the Government of India to build embankments to help the state overcome overwhelming floods. A committee appointed by the government in 1951, headed by G R Garg of the Central Waterways, Irrigation and Navigation Commission, thought otherwise. The Garg committee warned against any move to build embankments... embankments would probably cause more harm than good.

— Despite such apprehensions, Assam pushed for embankments. Between the 1950s and 1970s, thousands of kilometres of embankments were constructed along the Brahmaputra, the Barak, and their numerous tributaries.

— These embankments were the first major direct intervention aimed at controlling water flow on such a vast scale. Embankments had a simple goal: They would restrict the river from flooding fields, damaging crops, properties, livestock but they would keep the fields adequately wet.

— The embankments helped instil confidence among the rural population. But the sense of relief was short-lived. Aided by many forces, including holes made by rats, deluges continued to defy these walls. Yet, despite regular setbacks and the decided failure of the embankments, engineers, technocrats, contractors, elected representatives, and a section of the population collectively pushed for the expansion of embankments.

## SWEET SLICE OF ASSAM

Assam is blessed with diverse natural resources. The wide-ranging topography and congenial agro-climates offer immense potential for growing various kinds of fruit, vegetables, spices, flowers, and aromatic and medicinal crops.

Pineapple is widely grown in northeastern States, including Assam. The fruit is popular and their availability in the form of juice or slices round the year enable people to enjoy them whenever they want. Kew and Queen are the most popular varieties of pineapple among the growers in Assam. The Queen variety is widely grown.

Pineapple has recently gained much prominence for its health-promoting properties. Fresh pineapple is loaded with many essential vitamins and minerals.

Grown in the sunny fields of Assam, pineapples receive the right amount of sunshine and tropical rain to bring them to the peak of their flavour. The pineapple is a humid tropical plant. It grows well, both in the plains and also at elevations. Pineapple usually flowers from February to April and the fruits are ripe to harvest from July to September.

Two years ago, the Agricultural and Processed Food Products Export Development Authority organised a promotional event in Dubai to promote Assam's pineapples there. Processed



pineapples are also popular as they can last longer in the export market. A fully ripe pineapple is considered highly perishable, and cannot be kept for more than a few days after harvesting.

The major importers of pineapples from India are Nepal, Qatar, Saudi Arabia, the UAE and Maldives.

Recently, Meghalaya has started a scheme to promote fruit wine, including that of pineapples which have high sugar content. Pineapple wine can be processed from culled pineapple, pineapple peel, and the core.

#### EXISTING STRUCTURE AT M.P.'S BHOJSHALA COMPLEX BUILT USING TEMPLE REMAINS: ASI

The existing structure at the Bhojshala complex in Dhar district of Madhya Pradesh was constructed using the remains of a temple that existed earlier at the site, said the Archaeological Survey of India (ASI) in its scientific survey report, which was submitted to the Indore Bench of the Madhya Pradesh High Court on Monday.

The court had in March asked the ASI to undertake a scientific survey of the Bhojshala Temple-Kamal Maula Mosque complex.

The ASI said that based on the survey, conducted over a period of three months using technologies such as ground-penetrating radar and from archaeological remains studied during the investigation, the pre-existing structure "can be dated to the Paramara [dynasty] period".

"Art and architecture of the pillars and pilasters in colonnades suggest that they were originally part of a temple. For their reuse in the existing structure, figures of deities and humans carved on them were mutilated," the ASI report, a copy of which is with The Hindu, stated.

The survey found images of Hindu deities such as Ganesha, Brahma with his consorts, Narasimha, Bhairava and other human and animal figures in the existing structure.

"As human and animal figures are not permitted in mosque, at many places, such images have been chiselled out or defaced..." the ASI said.

The ASI report also said that inscriptions in Sanskrit and Prakrit were found at the site.

The report quoted an inscription on the gateway to the tomb of Abdullah Shah Changanal at Dhar which had said that the temple "was violently converted" into a mosque.

#### **Petitioners' reactions**

Reacting to the ASI's report, the Hindu petitioners expressed confidence in their case while the Muslim petitioners alleged violations by the surveying team.

Abdul Samad, president of the Kamal Maula Welfare Society and the petitioner from the Muslim side, alleged various violations during the survey on the part of the ASI team.

"The ASI has only submitted a written report of 2,000 pages. Our demand is that they should also submit the video evidence recorded during the survey. That will show that they have violated the Supreme Court guidelines and damaged things related to the Muslim community," Mr. Samad told The Hindu.



Meanwhile, Ashish Goyal of the Hindu Front for Justice, a petitioner from the Hindu side, said he was confident that based on the ASI survey, the site would be declared a temple and the Hindu community would be given the right to worship there on all days. "We are very happy about it," said Mr. Goyal.

The High Court will hear the case again on July 22.

#### KERALA SET TO USE TECHNOLOGY, TRADITION TO END HUMAN-WILDLIFE CONFLICT

The Kerala Forest Department aims at integrating cutting-edge technologies with traditional knowledge to effectively manage human-wildlife conflict in the State. The State government has green-lit an elaborate master plan comprising projects to the tune of ₹645 crore to mitigate the crisis which was recently declared a State-specific disaster.

The blueprint outlines 17 strategies to be implemented over three years, funded through Central-State allocations and schemes, including the Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS).

The initiative includes setting up Artificial Intelligence-based alert systems for real-time updates, thermal sensor-equipped drones, and camera traps to enhance surveillance along forest fringes.

The master plan also includes projects to erect barriers, both physical and biological, to thwart animal incursions into human habitations.

Beehive fencing, which has proved effective in Africa and various Southeast Asian countries in repelling elephants, will be set up along 6.6 km of forest boundaries.

Research will evaluate traditional knowledge from tribal communities such as 'bio-fences' using crops like chilli to prevent elephants from entering settlements. Habitat-management efforts will ensure adequate fodder in grasslands and interior forests, with new waterholes and check-dams to secure the water needs of the wildlife.

#### CHANCE TREASURE DISCOVERY SPARKS FRENZY

The chance discovery of a pot containing 18th-century gold and silver coins, and other period artefacts has suddenly elevated the profile of the sleepy village of Chengalai in Kannur district of Kerala.

Captivated by news of buried treasure, scores of people, possibly including fortune-seekers, are making a beeline for the leafy suburb dotted with rubber plantations.

The excitement generated by the news of the find has prompted the police to cordon off the spot for possible future excavations by the State Archaeology Department.

A group of local women labourers engaged in digging a rainwater harvesting pit for the Parappai Government School on Friday were the first to experience the exhilaration of discovering the buried treasure.

The homemakers, all beneficiaries of the rural employment guarantee scheme, said they approached the "strange object" with trepidation.





Some feared sorcery and wondered if the pot contained dark magic artefacts. Others worried the orb-shaped object could be an unexploded crude bomb, often used to settle political scores in Kannur. Nevertheless, their fear turned into excitement when they discovered the pot held a fortune from the past.

Vijayakumar Namboodiri, a resident, said ancestral houses in the locality buried valuables in pots in ancient temple groves. He noted that local myths about 'moola bhandari' or secreted assets were passed down generations and integral to local folklore.

K. Krishna Raj, the officer in-charge of the Pazhassi Raja Archaeological Museum in Kozhikode, said the locality rarely yielded historical collections and the riches could be some individual or family's fortune.

Mr. Raja noted that the coins bore the hallmarks of the late 18th century, with some displaying Indo-French and Kannur Ali Raja markings. The bead necklaces appeared to be from the same era. He stressed that only a comprehensive study could unveil the historical context of the remarkable find.

#### ASSAM'S 700-YR-OLD MOIDAMS TO BE CONSIDERED FOR WORLD HERITAGE LIST

The 700-year-old mound-burial system of the Ahom dynasty — the Moidams from Assam — will be considered for nomination on the World Heritage List next week during the 46th session of the World Heritage Committee (WHC) in New Delhi on Sunday. If the nomination comes through, it will become the first cultural site on the prestigious list from the northeastern region.

Prime Minister Narendra Modi will inaugurate the 46th session of WHC, which is being held in India for the first time. The event, to be held at Bharat Mandapam from July 21 to 31, brings together culture ministers, representatives and stakeholders from around the world to discuss the preservation of shared cultural, natural and mixed heritage.

The nomination dossier for the Moidams was sent more than a decade ago and is presently on the tentative list of UNESCO World Heritage Site, which is the first step towards the monument becoming a part of the final list.

It is among 28 sites proposed for inscription on the List, to be examined according to category: natural, mixed and cultural.

Besides, the committee will also discuss the state of conservation of the 124 sites already inscribed on the World Heritage List, 57 of which are also on the list of World Heritage in Danger.

Till date, the World Heritage Committee has inscribed 1,199 sites in 168 countries on the list. India has 44 of its sites on the list.

#### RATNA BHANDAR OF PURI TEMPLE TO BE OPENED TODAY

THE LOCK of the inner Ratna Bhandar (treasure trove) of Puri Jagannath Temple will be broken if it will not open with the existing "duplicate keys" with the Odisha government clearing a proposal to open the lord's treasury on Sunday, after a gap of almost four decades.

"The key is no more an issue now. Whether the keys will work or not, the Ratna Bhandar will be opened anyway. It's a fact that the lock has not been opened for a long period. There are also



chances of the lock getting rust since it's made of iron. If needed, we will break the lock," said Justice Biswanath Rath, who chairs the committee formed to supervise the process.

A "lock breaking group" will also be part of the team comprising representatives of temple managing committee, supervisory committee, servitors and Puri district administration, which will enter the lord's treasury on Sunday.

Amid tales about serpents guarding the Ratna Bhandar, the administration said they will take help from members of snake helpline.

"The members of the snake helpline and medical team will not go inside the temple. They will remain on standby near the temple administration office located outside the 12th century shrine. If needed, their help will be taken," said Justice Rath.

The precious ornaments of sibling deities — Lord Jagannath, Lord Balabhadra and Goddess Subhadra — donated by devotees and erstwhile kings over centuries are stored in the Ratna Bhandar of the temple. It has two chambers — Bhitari Bhandar (inner chamber) and Bahari Bhandar (outer chamber).

While the outer chamber is opened regularly to fetch ornaments for the deities during the Suna Besha (golden attire) — a key ritual during the annual Rath Yatra, and also during major festivals throughout the year — the last inventory of the lords' treasury was done in 1978.



**DreamIAS**



## BUSINESS & ECONOMICS

### CRYPTOCURRENCY FIRM WAZIRX SUFFERED A MAJOR SECURITY BREACH. HOW DID IT HAPPEN?

WazirX, one of the country's major cryptocurrency firms, suffered one of the biggest cyberattacks on an Indian exchange after hackers allegedly stole more than \$230 million of users' holdings, which was nearly half of the platform's reserves. The incident highlights the security challenges that cryptocurrency exchanges face, and how they have become a target for hackers worldwide.

WazirX called the security breach a "force majeure event" which was "beyond its control". "We have already blocked a few deposits and reached out to concerned wallets for recovery. We are in touch with the best resources to help us in this endeavour," the company said in a statement.

The company has temporarily halted rupee and crypto withdrawals on the platform. Here is what happened.

#### **What caused the WazirX security breach?**

In its preliminary findings, WazirX said that the cyber attack stemmed from a discrepancy between the data displayed on Liminal's interface and the transaction's actual contents. Liminal is a separate digital asset custody and wallet infrastructure provider.

During the cyber attack, there was a mismatch between the information displayed on Liminal's interface and what was actually signed. "We suspect the payload was replaced to transfer wallet control to an attacker," WazirX said.

"A cyber attack occurred in one of our multisig wallets involving a loss of funds exceeding \$230 million. This wallet was operated utilising the services of Liminal's digital asset custody and wallet infrastructure from February 2023," it added. A cryptocurrency wallet known as a MultiSig wallet (Multi-Signature wallet) involves the usage of two or more private keys to sign and approve transactions.

WazirX's wallet custody service provider Liminal Custody, however, said no breach had happened within its ecosystem.

"Our preliminary investigations show that one of the self-custody multisig smart contract wallets created outside of the Liminal ecosystem has been compromised," it said in a statement. "We can confirm that Liminal's platform is not breached and Liminal's infrastructure, wallets and assets continue to remain safe."

WazirX said its wallet had six signatories— five from its own team and one from Liminal, who were responsible for transaction verifications. A transaction typically requires approval from three of the WazirX signatories (all three of whom use Ledger Hardware Wallets for security), followed by the final approval from Liminal's signatory.

"A policy to whitelist destination addresses was also in place to enhance security. These whitelisted addresses were earmarked and facilitated on the interface by Liminal; consequently, the WazirX team had the ability to initiate transactions to the said whitelisted addresses," the company said.



“We had robust security features, including the Gnosis Safe multisig smart contract platform and Liminal’s whitelisting policy. Despite us taking all necessary steps to protect the customer assets, the cyber attackers appear to have possibly breached such security features, and the theft occurred,” it added.

#### **What have been some of the biggest crypto breaches?**

The WazirX cyberattack is not just the biggest security breach of a cryptocurrency exchange in India, but is among the top hacks in the world, too. 2022 was the biggest year for crypto hacks. According to blockchain data platform Chainalysis, over \$3.8 billion worth of cryptocurrency was stolen from users in 2022. In 2023, the number came down to about \$1.7 billion.

The biggest crypto hack so far took place in March 2022 when hackers attacked the Ronin network. They stole about \$625 million worth of Ethereum and the USDC stablecoin. In August 2021, a hacker exploited a vulnerability in Poly Network’s system, stealing over \$600 million in funds, but surprisingly did not leave with the entire amount and returned most of it. In October 2022, the Binance crypto exchange suffered a major security breach, resulting in a loss equivalent to \$570 million.

#### **IMF’S WORLD ECONOMIC OUTLOOK UPDATE FOR INDIA: HOLDING STEADY**

The global economy is expected to grow at a stable pace in the near term. Growth has been pegged at 3.2 per cent in 2024 and 3.3 per cent in 2025 as per the July update of the International Monetary Fund’s World Economic Outlook. This is in line with the Fund’s assessment in April. Among developed economies, the IMF has raised its growth forecast for Spain and France, while paring down its earlier assessment of Japan. In the case of emerging markets and developing economies, the Fund has now lowered its expectations of growth prospects of the Middle East and Central Asia region as well as parts of Latin America, while sharply raising its expectations of the Chinese and Indian economy.

The IMF now expects the Indian economy to grow at 7 per cent in 2024, up 0.2 percentage points from its earlier assessment. The more upbeat prognosis, in part, reflects “improved prospects for private consumption, particularly in rural areas”. This is in line with the assessment of other agencies. On Wednesday, the Asian Development Bank reaffirmed its outlook for India, pegging growth at 7 per cent. ADB expects the agriculture sector to “rebound”, with the monsoon likely to be above-normal. On the other hand, the RBI has projected growth to be marginally higher at 7.2 per cent, while others like Crisil and ICRA have pegged it slightly lower at 6.8 per cent. These projections indicate that the underlying economic momentum remains healthy. The outlook for the next year also appears bright — the IMF has projected the economy to grow at 6.5 per cent, while the ADB expects growth at 7.2 per cent.

The World Economic Outlook notes that across the world, progress on disinflation is slowing. The risks to inflation have risen, and this raises “the prospect of higher for even longer interest rates”. In June, the US Fed chose to maintain the status quo on rates as the committee members opted to wait for “favourable” data that indicates that inflation is moving sustainably towards its target. As per the Fed dot-plot, there is now the likelihood of only one rate cut this year, down from earlier expectations of three cuts. Across the Atlantic, while the European Central Bank cut rates in June, there are expectations of status quo in the July meeting, and for the Bank to wait for more macroeconomic data before taking further action. On the other hand, as the IMF also notes, central banks in emerging economies are being “cautious” on lowering rates due to the implications for



their currencies. In the case of India, while two members of the monetary policy committee have voted to cut rates, a change in policy appears unlikely in the near term as uncertainty over the trajectory of inflation, food in particular, persists.

## TRADE TACT

India's goods exports rose for the third successive month this June, growing 2.55% to \$35.2 billion. Imports grew 5% to \$56.2 billion, receding from May's seven-month peak of nearly \$62 billion. The trade deficit, despite rising 9.4% from last June, has cooled slightly from the previous month. The oil deficit, which had hit a record \$13 billion in May, remains a worry despite narrowing to \$10 billion. Petroleum exports fell 18.3% to \$5.5 billion, and were below May's tally by almost the same extent. With oil prices virtually unchanged over the last two months, this signals a drop in export volumes, just as a sharper 19.6% rise in June's oil imports suggests a domestic demand spike. Overall oil imports have risen over 23% in the April to June quarter, with global prices about 9% higher than a year ago. The oil deficit accounts for almost half of the first quarter trade deficit of \$62 billion in the first quarter, which is 10.9% over that of last year.

The value of gold imports fell 38.7% in June to \$3.06 billion, the lowest so far in 2024-25. But silver imports, which have been rising sharply, jumped 377% in June. The government must investigate concerns about disruptions in India's bullion market due to concessional duty imports through the GIFT City under the free trade pact with the United Arab Emirates. Alongside, a sustained decline in India's gems and jewellery exports, which contracted for the seventh successive month in June, needs attention. The import bill, beyond oil and gold, has risen about 3% so far this year, from a 10% dip in the same quarter last year, with growth accelerating to 7% in June, indicating a recovery in discretionary domestic demand — a good omen for the economy. India's trade policy focus must stay on boosting exports rather than checking the deficit which has been termed a natural corollary of growing faster than the world. It is notable that at least 19 of India's top 30 export sectors have grown over May and June, from just 13 in April. Waning global inflation, and likely interest rate cuts can fuel demand, and the International Monetary Fund has raised its trade volume growth hopes to 3% in 2024 from 0.3% last year. For exporters to fully tap this opportunity after a rough year, and create more jobs in the process, the Centre must provide adequate resources as well as certainty for the sector, be it for the duty remission scheme or the interest equalisation scheme. Sudden policy shifts such as the recent scrapping of the latter scheme for all exporters, except for smaller firms (which have been promised support for only two more months), are certainly avoidable.

## THE YUAN CHALLENGE: HOW INDIA-RUSSIA TRADE GAP MAY THREATEN RUPEE INTERNATIONALISATION EFFORTS

In a strategic move to curb its burgeoning oil import bill and reduce dependence on the expensive US dollar, New Delhi aims to bolster bilateral trade with Moscow to \$100 billion by 2030. However, the dynamics of India-Russia trade have been skewed since the onset of the Ukraine war in 2022. Russia has rapidly ascended to become India's top oil supplier, but Indian exports to Russia have struggled, resulting in a \$57 billion trade deficit in the bilateral trade worth \$66 billion in FY24.

While India has managed to save over \$10 billion by importing cheaper Russian oil in the last two years and has benefited from exporting petroleum products by processing Urals crude, meager exports to Russia mean that a historic geopolitical opportunity to cut dependence on the



expensive US dollar has remained elusive. Here is why continued unbalanced trade with Russia could force India to use the Chinese yuan, which runs counter to its efforts toward internationalising the rupee.

#### **Why is the widening trade gap with Russia benefiting the yuan?**

Unlike India, China has seized the export opportunities emerging in Russia amid crippling Western sanctions and a host of Western companies and banks exiting the war economy. Chinese exports to Russia have actually grown faster than imports of Russian oil. Chinese customs data shows that shipments to Russia jumped by 47 per cent year-on-year to \$111 billion in 2023, while imports grew by 13 per cent to \$129 billion. The two-way trade crossed a record \$240 billion in 2023.

Since trade between the two countries is more balanced compared to India-Russia trade, it has fostered the use of domestic currency. The Russian government has stated that 95 per cent of trade between China and Russia occurs in domestic currency. As a result, the yuan is the most sought-after currency in the Russian stock market, even more popular than the powerful US dollar. Russian oil exports are therefore requesting payments from Indian refineries in Chinese currency, while the use of the rupee has remained restricted.

#### **How can India internationalise the rupee?**

Even as India aims to reduce its dependence on the US dollar, it does not support the yuan as a currency for settling international trade due to recurrent border tensions with neighboring China. In July 2022, the Reserve Bank of India (RBI) issued a circular permitting an additional arrangement for settling trade using the rupee.

However, the FY23 Economic Survey states that one prerequisite for the emergence of an international currency is that it “needs to be increasingly used for trade invoicing.” According to the BIS Triennial Central Bank Survey 2022, the US dollar is the dominant vehicle currency, accounting for 88 percent of global forex turnover, while the rupee accounts for just 1.6 per cent.

The survey indicated that if rupee turnover rises to equal the share of non-US, non-Euro currencies in global forex turnover (4 per cent), it will be regarded as an international currency.

#### **Why are exports to Russia challenging?**

The biggest challenge has been the reluctance of private banks to facilitate trade with Russia due to fears of Western sanctions. Most private banks have significant business interests in Western countries and multiple branches that could face sanctions imposed by the European Union (EU) and the US.

To address this, the joint statement following Prime Minister Narendra Modi’s visit stressed the need to “increase Indian exports to Russia” by strengthening industrial cooperation. Indian exporters are also facing difficulties using the rupee settlement mechanism while trading with Russia. Exporters initially complained that although the RBI had launched the mechanism, they were unable to use it due to the absence of a Standard Operating Procedure (SOP) for banks. Moreover, the ruble and rupee, unlike the yuan, have experienced considerable volatility, complicating trade in domestic currency.



### How are Russia and India planning to boost trade?

During Modi's visit, both countries decided to eliminate non-tariff and tariff barriers in trade and to initiate negotiations for a trade deal with the Russia-led Eurasian Economic Union (EEU), which could ease the flow of Indian products into the EEU. The EEU consists of five member states: Russia, Belarus, Kazakhstan, Kyrgyzstan, and Armenia, representing a \$5 trillion economy.

According to the joint statement, India and Russia agreed to cooperate in manufacturing sectors such as transport engineering, metallurgy, and chemicals.

Russia and India have also planned the implementation of joint projects in priority areas and emphasised the importance of expanding reciprocal trade flows of industrial products to increase their share in bilateral trade. The statement further reflected discussions on the migration and mobility partnership agreement between the two countries.

## IN SEARCH OF JOBS

Employment generation will remain a major challenge before the Narendra Modi government in its third term, and the upcoming Union Budget is expected to take note of it. There are no easy ways out, given the swelling numbers of young job seekers, and the changing nature of the economy that requires fewer workers, thanks to rapid technological advancement. Recent studies have highlighted the seriousness of the challenge. The Annual Survey of Unincorporated Sector Enterprises (ASUSE) notes that just 21% of the total establishments used the Internet for entrepreneurial activities. The survey, quite similar to a previous report of the International Labour Organisation (ILO), says the unincorporated non-agricultural economy employed about 11 crore workers during October 2022 to September 2023 in comparison to about 9.8 crore workers during 2021-22. The ILO's India Employment Report had also warned that the share of manufacturing employment was stagnant, at around 12%-14% and the slow transition of jobs from agriculture to non agriculture reversed due to the COVID-19 pandemic. A Citigroup report too said the current rate of job creation will not be sufficient to meet future demand. The ASUSE had also noted that 'Other Services' contributed the maximum share (36.45%) to the total employment followed by 'trading' (35.61%) and 'manufacturing' (27.94%). Various Periodic Labour Force Surveys had also noted that 45.76% of the total workforce was engaged in agriculture and allied sectors during 2022-23.

While the government cannot magically change the situation, it can initiate thoughts about solutions. The Swadeshi Jagran Manch has demanded that the Centre impose a robot tax and incentivise job creation in the Budget. The trade unions have asked the Centre to convene the long-pending Indian Labour Conference. Union Labour Minister Mansukh Mandaviya's decision to reach out to trade unions is a positive development, but he must have stronger prescriptions than the Labour Codes to stop job losses and generate more jobs. Technological innovations should be to reduce the workload of people, and not to create hurdles for their livelihood. To industrialise agriculture production, the government should consider more public and cooperative investment to create more jobs and ease the load on farmers. It has to bring on board the private and public sectors, labour unions, States and political parties to design a growth model with job creation at its centre. Recent global experiences suggest that economic growth without employment growth can cause social and political upheavals. This is not a problem that can be explained away, and an honest account of the problem will be a good starting point for mitigative measures.



## THE PROBLEM WITH BILLIONAIRE CONSUMPTION

The lavish and extended wedding celebrations of billionaire Mukesh Ambani's youngest son has brought to the forefront the question of "conspicuous consumption" of the rich. In a capitalist society beset by high levels of inequality, how do we make sense of such displays of private wealth by the elite? Does billionaire consumption in an unequal society hinder or aid economic expansion? What are some of the ethical and economic issues involved? The issues discussed here do not pertain solely to the Ambanis, but attempt to tackle some broader questions regarding the question of private consumption by the rich.

### Perspectives from the right and left

A defence of billionaires' consumption would run as follows: in a liberal capitalist democracy, there are no restrictions on what one chooses to do with one's private property. Assuming that market processes are fair, billionaires' consumption expenditure — no matter how lavish — is a legitimate exercise of their private freedoms and cannot be faulted. The existence of inequality is not their concern, but the manifestation of flawed policy that restricts market freedom and curtails pure competition. Increasing market access, in this view, would ensure that everyone has adequate wealth.

On the opposite end of the political spectrum, the Marxist view holds that since value is created solely by labour, profits represent an unfair extraction of value. Thus, all forms of billionaire consumption is illegitimate, since private riches are generated through a denial of the rightful claims of workers. The co-existence of a large working class with low wages and a small number of billionaires does not arise because of a faulty market mechanism, but is an undeniable feature of capitalism itself. The rights over private property enshrined in liberal societies hide deep structural imbalances that serve to continually enrich a few at the expense of the many; in this framework, there can be no way to justify billionaire consumption.

### The impact on the economy

Another defence of billionaire consumption is that regardless of the ethical issues involved, as long as consumption is done domestically, the expansion of purchasing power leads to an increase in demand for locally-made goods, and an increase in domestic employment and incomes. In economies like India where the generation of suitable employment is a matter of grave concern, private consumption of the rich ensures a vital boost to aggregate demand. Yet this represents a second-best solution to the problem of demand, since what is required for growth in living standards is investment, not consumption.

Consider two sectors in an economy, a consumption sector that produces clothes, and an investment sector that produces sewing machines. Assume that every year, the local billionaire spends a given amount of money to purchase clothes, but does not put in any order for new sewing machines. The demand for clothes generates employment, but the capital stock — represented by the sewing machines — does not change, and hence neither does labour productivity. Since per capita incomes depend on labour productivity, living standards do not rise. There might be employment, but no growth.

If the billionaire was to purchase sewing machines, this investment would generate employment not just in the investment sector — as workers are hired to produce sewing machines — but also in the consumption sector, since these newly-hired workers would purchase clothes.





Consumption spending does not necessarily generate investment spending, but investment spending, through the working of the multiplier effect, necessarily increases demand in the consumption sector as well.

Moreover, investment would ensure the capital stock is upgraded with the latest machinery, increasing the productivity of labour and per capita incomes. Long-run growth crucially depends on investment spending, which is the domain of the rich, since working classes do not control the operations of businesses and have no say in the prospects of capital expansion.

#### **A “social contract”**

According to the celebrated British economist John Maynard Keynes, capitalist societies rest on a peculiar social contract. The capitalist classes are allowed greater wealth, control of production and a substantial share of net output produced each year, provided they ensure high levels of investment that generate sufficient employment and rising productivity. They must also ensure that prices are not increased drastically so that real wages do not fall. This can be the only grounds for an unequal distribution of resources in a capitalist society from a Keynesian perspective.

The greater the share of profits invested, the greater is economic welfare. Keynesian growth theory specifies that the rate of growth is highest when the entire share of profits is invested (for given technical conditions). In mainstream growth theory, the level of per capita consumption is highest when the entirety of profits is invested; this is known as the “Golden Rule”. Conspicuous consumption out of profits can therefore be seen as reducing the amount available for investment, and hence reducing welfare.

Herein lies the peculiar problems that affect modern capitalism. Since profits accrue privately, the decision to invest is also taken privately. In certain instances, capitalists may wish not to invest, for the risks would certainly outweigh the potential benefits. They may also choose to engage in pure consumption and lavish ceremonies, and liberal societies allow them the uncontested right to do so. But this represents a loss for the working classes, since it draws resources away from the expansion of the capital stock, reducing employment and labour productivity growth. Modern societies have granted capitalists the right to profit, but cannot extract from them a duty to invest, specifically during times of economic recessions. In contrast, workers have no right over the very aspect of spending — investments — that affects their employment and living standards.

This takes added significance in the presence of monopoly, where even if investment occurs, working classes are affected through the imposition of monopoly prices that reduce real wages and purchasing power.

The purpose of this piece is not to point fingers at specific instances of conspicuous consumption, but to place some economic issues in context. As opposed to a Marxist analysis, a Keynesian understanding would hold that lavish consumption of the rich is a problem only if enough investment is not forthcoming to absorb those searching for jobs and if the consumption of working classes is curtailed through high monopoly prices. In the context of high youth unemployment, stagnant real wages and a significant loss of jobs in the informal sector, the stark inequalities on display represent a very real public policy problem that we have shown an inability and unwillingness to confront.



## RETURN ON FOREIGN CURRENCY ASSETS DOUBLES IN TWO YEARS

With interest rates rising in the US and other developed countries amid high inflation, the return, or the interest earned, on India's foreign currency assets doubled to 4.21 per cent during the fiscal ended March 2024 from 2.11 per cent in March 2022, the Reserve Bank of India (RBI) said.

The foreign currency assets comprise of multi-currency assets that are held in multi-asset portfolios. The total value of securities in FCA was \$468.98 billion as of March 31, 2024. This means on a 4.21 per cent return, RBI would have earned over \$19 billion as interest income. The rate of return on FCA was 3.73 per cent in FY2023 and 2.10 per cent in FY2021 and 2.65 per cent in FY2020, the RBI said in its reply to the RTI application filed by The Indian Express.

The US Federal Reserve hiked the effective federal funds rate (EFFR) to 5.33 per cent in the last two years, which is higher than the long-term average of 4.61 per cent. The EFFR is the interest rate set by the Federal Open Market Committee (FOMC) for banks to borrow money from each other. The US Federal Reserve sets an upper and lower limit for the EFFR and aims to keep it within that range by adjusting the target range for the federal funds rate. The current target range is 5.25 per cent to 5.50 per cent.

CD (certificate of deposit) rates offered by US banks are in the range of 5.20 per cent. On the other hand, the RBI's main policy rate – Repo rate – is currently 6.50 per cent. State Bank of India (SBI) offers an interest rate of 7 per cent on two-year deposits, at least 200 basis points higher than the US banks.

Return on foreign currency assets doubles in two years

As of July 11, 2024, the annual inflation rate in the US was 3 per cent for the 12 months ended in June, down from the previous rate increase of 3.3 per cent. This is lower than the long-term average of 3.28 per cent. After adjusting for inflation, the return on FCA is positive for the RBI.

Meanwhile, the RBI reduced the gold kept in safe custody with the Bank of England and the Bank for International Settlements (BIS) by around 50 tonnes to 387.26 metric tonnes during FY24. The RBI apparently reduced the gold held abroad due to the high cost involved. "The information cannot be provided as it falls under the category of information which is exempted under Section 8(1Xa) of the Right to Information Act 2005," the RBI said in its RTI reply when sought the cost of keeping gold in safe custody abroad.

As at end-March 2024, the Reserve Bank held 822.10 metric tonnes of gold, of which 408.31 metric tonnes were held domestically. While 387.26 metric tonnes of gold were kept in safe custody with the Bank of England and the Bank for International Settlements (BIS), 26.53 metric tonnes were held in the form of gold deposits.

Union Road Transport and Highways minister Nitin Gadkari had earlier pitched for formulating a policy for using the RBI's rising foreign exchange reserves for funding road projects, saying the country needs low-cost finance for such infrastructure projects. However, the RBI has the mandate to invest up to \$5 billion in the bonds issued by the India Infrastructure Finance Company (UK) Limited. As at end of March 2024, the amount invested in such bonds stood at \$ 932 million.

As at end-March 2024, out of the total FCA of \$ 570.95 billion, \$ 468.99 billion was invested in securities, \$62.17 billion was deposited with other central banks and the BIS and the balance \$



39.79 billion comprised deposits with commercial banks overseas. With the objective of exploring new strategies and products in reserve management while diversifying the portfolio, a small portion of the reserves is being managed by external asset managers. The investments made by the external asset managers are governed by the permissible activities as per the RBI Act, 1934.

## SEBI'S NEW ASSET CLASS, POSITIONED BETWEEN MFS AND PMS: HOW WILL IT BENEFIT INVESTORS?

The markets regulator has proposed a new asset class that will offer investment products positioned between mutual funds (MFs) and portfolio management services (PMS) to fill an opportunity gap for investors and offer flexibility in portfolio construction.

### What is Sebi's new asset class?

The new category of products, which would be introduced under the mutual fund structure, would have a minimum investment of Rs 10 lakh. The new asset class will have a risk-return profile between that of MFs and PMS, which means it will be aimed at investors who have greater risk-taking capabilities and higher investment amounts than in MFs, but lower than in PMS.

"The proposed New Asset Class intends to fill the gap between MFs and PMS by offering a regulated product featuring greater flexibility, higher risk-taking capability and a higher ticket size, to meet the needs of the emerging category of investors," the Securities and Exchange Board of India (Sebi) said in a consultation paper on Wednesday (July 19).

### What are the ticket sizes of MF and PMS investments?

PMS are a category of professional financial services in which a skilled portfolio manager and stock market manager provides customised investment solutions to high net-worth individuals (HNIs) who are looking to invest in instruments such as equity, debt, gold, etc. The minimum investment limit in PMS is Rs 50 lakh.

PMS are different from MFs, where the minimum investment limit is just Rs 100, and a pool of money is managed by a professional fund manager.

### What is the objective of the proposed investment product?

Sebi said that because of the gap between investment opportunities available in MFs and PMS, some investors in the segment are getting drawn towards unauthorised investment avenues. The new asset class will help in curbing the proliferation of unregistered investment products.

The current range of investment products with varying risk-reward profiles are intended to meet the investment needs of retail, high net-worth, and institutional investors, Sebi said in the paper.

These products include MF schemes, which are focused on retail investors; PMS; and alternative investment funds (AIF), a privately pooled investment vehicle that collects funds from sophisticated investors, whether Indian or foreign, to make investments in accordance with a defined investment policy for the benefit of the investors. The floor investment in AIF is Rs 1 crore.

"And so, a notable opportunity of a 'New Asset Class' has emerged between mutual funds and PMS in terms of flexibility in portfolio construction," the Sebi paper said.



The absence of such a product appears to have nudged investors in this segment towards unregistered and unauthorised investment schemes/ entities that promise unrealistically high returns, exploiting the expectation of investors for better yields, and leading to potential financial risks, Sebi said.

“Therefore, a New Asset Class would provide a regulated and structured investment suited to the investors in this segment,” it said.

#### **How will investments in the new asset class work?**

The new asset class is proposed to be introduced under the MF structure, with relaxations in prudential norms necessary for such a product category to be effective. The enhanced risks due to the relaxations may be mitigated by putting a higher limit on the minimum investment size.

The minimum investment amount for the new asset class has been proposed at Rs 10 lakh per investor within the asset management company (AMC)/ MF. An AMC is an institution which manages and oversees operations of mutual funds.

This means that an investor must invest a minimum of Rs 10 lakh, across one or more investment strategies, under the new asset class offered by an AMC/MF. “This threshold shall deter retail investors from investing in this product, while attracting investors with investible funds between Rs 10 lakh and Rs 50 lakh, who are today being drawn to unauthorised and unregistered portfolio management service providers,” the market regulator said.

Like MF schemes, the new asset class will provide investors with an option of Systematic Investment Plan (SIP), Systematic Withdrawal Plan (SWP), and Systematic Transfer Plan (STP).

#### **Who will benefit from the new asset class and how?**

Radhika Gupta, Managing Director and Chief Executive Officer of Edelweiss Mutual Fund, said the creation of a structure for differentiated, higher-risk strategies looked promising. “From the customer’s point of view, there is nothing like the convenience of the MF platform, regulated, transparent, with great features like SIPs, and now getting increasingly open for innovation,” she said.

Sandeep Jethwani, co-founder of Dezerv, a wealth management solutions provider, said higher-risk profile investors can now access regulated opportunities without the high minimum thresholds of PMS and AIF, or resorting to unregulated structures, which bodes well for the protection of wealth. However, he said that the decision on taxation — whether at the mutual fund level or under new norms — will be crucial for its adoption.

In the new category of products, an AMC can offer ‘investment strategies’ under pooled fund structure, akin to mutual funds schemes. The redemption frequency of these investment strategies can be tailored (daily/ weekly/ fortnightly/ monthly/ quarterly/ annually/ fixed maturity) based on the nature of investments to allow the investment manager to adequately manage liquidity without imposing undue constraints on investors.

Some of the investment strategies that may be permitted include:

i) Long-short Equity Fund: A fund that seeks to deliver returns by taking long and short positions in equity and equity-related instruments. For example, the fund may be bullish on the automobile



sector and bearish on the IT sector, and may invest in both these sectors by going long on the automobile sector and short on the IT sector.

ii) Inverse ETF/ Fund: A fund that seeks to generate returns that are negatively correlated to the returns of the underlying index.

The new asset class will be able to take exposure in derivatives for purposes other than hedging and portfolio rebalancing, subject to compliance with relevant provisions. This will provide more flexibility and risk-taking in investments and potentially generate higher returns, SEBI said.

## WHAT IS THE ROLE OF THE FINANCE COMMISSION?

### The story so far:

The sixteenth Finance Commission headed by former Niti Aayog Vice-Chairman Arvind Panagariya has begun its work by inviting suggestions from the public on the mandate set for it by the Centre. The latest Finance Commission, which consists of five members including the chairman, was constituted in December last year and is expected to submit its recommendations by October, 2025. Its recommendations will be valid for five years starting from April 1, 2026.

### What is the Finance Commission?

The Finance Commission is a constitutional body that recommends how tax revenues collected by the Central government should be distributed among the Centre and various States in the country. The Centre, however, is not legally bound to implement the suggestions made by the Finance Commission. The Commission is reconstituted typically every five years and usually takes a couple of years to make its recommendations to the Centre.

### How does the Commission decide?

The Finance Commission decides what proportion of the Centre's net tax revenue goes to the States overall (vertical devolution) and how this share for the States is distributed among various States (horizontal devolution). The horizontal devolution of funds between States is usually decided based on a formula created by the Commission that takes into account a State's population, fertility level, income level, geography, etc. The vertical devolution of funds, however, is not based on any such objective formula. Nevertheless, the last few Finance Commissions have recommended greater vertical devolution of tax revenues to States. The 13th, 14th and 15th Finance Commissions recommended that the Centre share 32%, 42% and 41% of funds, respectively, from the divisible pool with States. It should be noted that the Centre may also aid States through additional grants for certain schemes that are jointly funded by the Centre and the States.

The 16th Financial Commission is also expected to recommend ways to augment the revenues of local bodies such as panchayats and municipalities. It should be noted that, as of 2015, only about 3% of public spending in India happened at the local body level, as compared to other countries such as China where over half of public spending happened at the level of the local bodies.

### Why is there friction between the Centre and States?

The Centre and the States have been at loggerheads over the issue of sharing tax revenues for a while now. The Centre collects major taxes such as the income tax, the corporate tax, and the goods and services tax (GST) while the States primarily rely on taxes collected from the sale of goods



such as liquor and fuels that are beyond the ambit of GST. The States, however, are responsible for the delivery of many services to citizens, including education, healthcare and the police. This has led to complaints that the Centre has reduced the power of the States to collect taxes and that it does not give enough funds to the States to match with the scale of their responsibilities.

### What are the disagreements?

The States and Centre often disagree on what percentage of the total tax proceeds should go to the States and about the actual delivery of these funds.

States argue that they should receive more funds than what is recommended by the Finance Commission as they have greater responsibilities to fulfil than the Centre. They also point out that the Centre does not even share the amount of funds recommended by the Finance Commissions, which they believe is already too low. For example, according to analysts, the Centre has devolved an average of only 38% of funds from the divisible pool to the States under the current Fifteenth Finance Commission as against the Commission's actual recommendation of 41%.

Further, States have complaints about what portion of the Centre's overall tax revenues should be considered as part of the divisible pool out of which the States are funded. It is believed that cesses and surcharges, which do not come under the divisible pool and hence not shared with the States, can constitute as much as 28% of the Centre's overall tax revenues in some years, causing significant revenue loss for States. So, the increased devolution of funds from the divisible pool, as recommended by successive Finance Commissions, may be offset by rising cess and surcharge collections. In fact, it is estimated that if cesses and surcharges that go to the Centre are also taken into account, the share of States in the Centre's overall tax revenues may fall to as low as 32% under the 15th Finance Commission.

More developed States such as Karnataka and Tamil Nadu have also complained that they receive less money from the Centre than what they contribute as taxes. Tamil Nadu, for example, received only 29 paise for each rupee that the State contributed to the Centre's exchequer while Bihar gets more than ₹7 for each rupee it contributes. In other words, it is argued that more developed States with better governance are being penalised by the Centre to help States with poor governance. Some critics also believe that the Finance Commission, whose members are appointed by the Centre, may not be fully independent and immune from political influence.

## EXPLAINED: THE GREEN REVOLUTION IN MAIZE

The Green Revolution was largely about wheat and rice. India became self-sufficient, if not surplus, in these two cereal grains, thanks to high-yielding varieties bred by institutions such as the Mexico-based CIMMYT (International Maize and Wheat Improvement Center) and the Indian Agricultural Research Institute (IARI) in New Delhi, under the leadership of scientists like Norman Borlaug and M S Swaminathan.

There is, however, another less celebrated revolution that has taken place in India — in maize. Between 1999-2000 and 2023-24, its annual output has more than tripled, from 11.5 to over 35 million tonnes (mt), with average per-hectare yields also rising from 1.8 to 3.3 tonnes.

Maize, unlike rice and wheat, isn't much of a food grain. Hardly a fifth of India's maize production is used for direct human consumption. An estimated 60% goes as feed for poultry birds and livestock. Such maize is indirectly consumed as food by households – in the form of chicken, egg or milk.



The chicken that one eats is basically “maize with wings”. A market-ready broiler bird weighing 2-2.5 kg consumes some 4 kg of feed during its rearing cycle of 40-42 days, from a 35-40 gm day-old chick. Broiler feed itself contains 55-65% maize by weight, with these at 50-60% for egg-layer feed, and 15-20% in cattle feed. Maize supplies carbohydrates, the principal energy source for poultry and livestock. Other feed ingredients include protein sources (soyabean meal and other oilseed cakes), mineral and vitamin supplements, and additives.

### **Starch and ethanol**

Food and feed apart, 14-15% of India’s maize utilisation is for industrial purposes. Maize grains have 68-72% starch, and 1-3% of other simple carbohydrates (sucrose, glucose and fructose). Starch has applications in the textile, paper, pharmaceutical, food and beverage industries.

More recent is maize emerging as a feedstock for ethanol that is used for blending with petrol. Distilleries run on sugarcane molasses and juice/syrup during the crushing season (November-April). In the off-season (May-October), when cane isn’t available, they use grains. That, until recently, was mainly surplus rice from the Food Corporation of India. But with the government stopping its supplies on concerns over depleting stocks and “food security”, the focus has shifted to maize.

### **Rise in maize production over last two decades**

That’s where the role of research comes in. IARI has bred India’s first “waxy” maize hybrid with high amylopectin starch content, making it better suited for ethanol production. The starch in maize is a mixture of two polymers, comprising glucose molecules bonded together in a straight chain (amylose) and in branched form (amylopectin).

Normal maize starch has 30% amylose and 70% amylopectin. The starch from IARI’s waxy maize hybrid (AQWH-4) has 93.9% amylopectin. Amylose starch imparts hardness in the grain, while amylopectin causes softness. That, in turn, affects starch recovery and fermentation rates. Normal maize grains have 68-72% starch, but only 58-62% is recoverable. The grains from the new Pusa Waxy Maize Hybrid-1, as it is proposed to be called, have 71-72% starch with 68-70% recovery.

“Softness ensures better grinding of the grains fed into the mill for making flour. Granules with higher amylopectin are also easily accessible by alpha-amylase, the enzyme that hydrolyses or breaks down the starch into smaller glucose units. The glucose is, then, fermented into ethanol using yeast,” Firoz Hossain, principal scientist at IARI, said.

The IARI-developed hybrid, having an average grain yield of 7.3 tonnes per hectare and potential of 8.8 tonnes, has been identified for release under the All-India Coordinated Research Project on Maize. “We’ll soon be going to the Central Variety Release Committee. Once they approve, the hybrid will be officially released and notified (for commercial cultivation),” Hossain said.

IARI has signed a memorandum of understanding with the Uttar Pradesh Distillers’ Association for field trials of its waxy maize hybrid. “We get roughly 390 litres of ethanol from one tonne of normal maize grain. The higher recoverable starch from waxy maize should take that to 415-420 litres,” S K Shukla, business head at India Glycols Ltd’s distillery in Gorakhpur, said. The company is promoting the cultivation of improved maize hybrids for ethanol production by farmers in eastern UP’s Gorakhpur, Maharajganj, Sant Kabir Nagar and Basti districts.



### New breeding strategies

Meanwhile, CIMMYT has opened a maize doubled haploid (DH) facility at Kunigal in Karnataka. Established in partnership with the University of Agricultural Sciences, Bangalore, it produces 100% homozygous (i.e. having two identical copies of a single gene), and genetically pure inbred lines of maize that can be used as parents for further crossing and breeding of hybrids.

“In the conventional process, inbred lines are formed by continuous self-pollination for 6-8 generations. DH technology enables production of completely uniform lines after just two cropping cycles. It speeds up inbred line development, thereby improving the efficiency of maize breeding and shortening the process,” CIMMYT’s director-general Bram Govaerts told The Indian Express.

The Kunigal facility, set up in December 2022, produced and shared 29,622 maize DH lines last year. “We have many high-yielding lines tolerant to drought, heat and water-logging, besides those that are nutrient-use efficient and resistant to pests and diseases such as fall armyworm and maize lethal necrosis,” added Govaerts.

The Green Revolution in wheat and rice was a result of farmers cultivating high-yielding varieties mostly bred by CIMMYT, IARI and other public sector research organisations. Being self-pollinating plants – their flowers contain both the male and female reproductive organs – these crops aren’t amenable to hybridisation. This is as against maize, whose cross-pollinating nature (the male and female parts are located in different areas of the plant) makes hybrid breeding commercially viable.

Private sector-bred hybrids account for more than 80% of the 10 million hectares-plus area planted to maize in India. Their higher yields, from crossing two genetically dissimilar inbred plants, are limited to the first generation. Farmers cannot harvest the same yields if they save the grains from these and reuse as seed.

In maize, CIMMYT is sharing its improved inbred lines with both public sector institutions and 25-odd private seed companies. These include Mahyco, Shriram Bioseed, Advanta Seeds, Nuziveedu Seeds, Kaveri Seeds, Mahindra Agri Solutions, Rasi Seeds and Indo-American Hybrid Seeds.

The Green Revolution in maize has been, and continues to be, a private sector-led one.

### SURPRISE ACCELERATION

Retail price gains registered a surprise acceleration last month with June’s provisional Consumer Price Index (CPI) reading showing inflation snapping a five-month downtrend and quickening to 5.08%, 28 basis points faster than the 4.80% logged in May. Food prices were, as expected, the main culprit. Year-on-year food price inflation based on the Consumer Food Price Index (CFPI) quickened by 67 basis points in June to a worrying 9.36%. Even more disconcertingly, the CFPI logged the fastest sequential acceleration in 11 months, as food prices rose by 3.17% from May’s levels and dragged the broader CPI too higher by 1.33% from the preceding month. It is precisely this kind of unpredictability in food price gains that monetary policymakers have been concerned about in opting to leave interest rates unchanged. RBI Deputy Governor Michael Debabrata Patra had been emphatic in observing at the Monetary Policy Committee’s meeting last month that “the Indian economy remains hostage to intersecting food price shocks. Their repetitive occurrence calls for intensifying monetary policy vigil to ward off spillovers to other components of inflation and to expectations”. Food price data show that the CFPI’s nine sub-categories posted month-on-





month gains, with eight of them, except the sugar and condiments group, registering sequential accelerations. Vegetables continued to experience the most intense price gains, rising 29.3% year-on-year and by a worrying 11-month-high sequential pace of 14.2%. The most widely consumed potato, onion and tomato continued to log some of the fastest gains, with their prices rising year-on-year by 57.6%, 58.5% and 26.4%, respectively.

Nor does the outlook for food prices offer much comfort. Data on the Department of Consumer Affairs Price Monitoring Division's website shows that the all-India average retail price of potato and onion continued to remain on a tear as on July 15, being almost 56% and 67% higher, respectively, than a year earlier. And tomato prices, though almost 43% softer than 12 months ago, were 76% higher than in mid-June, likely signalling a shift in its price momentum. Prices of cereals, the largest constituent of the food basket, too offered little respite with the average retail price of rice and wheat running almost 10% and 6% higher than a year earlier, respectively. Also, IMD data as on July 14 reveal that countrywide precipitation since June 1 was still not only at a 2% deficit, but also spatially skewed. Eleven of India's 36 meteorological sub-divisions were still classified 'deficient', meaning these regions had received 20%-59% lower rainfall than the long-period average. With some key food growing areas including Punjab seeing deficient rains, policymakers face an unenviable task in trying to slow the pace of inflation.

#### BIHAR GOVERNMENT SEEKS MINIMUM SUPPORT PRICE (MSP) FOR MAKHANA

The Bihar government has urged the Centre to declare the Minimum Support Price (MSP) for makhana, an aquatic crop cultivated across 10 districts in the state, The Indian Express has learnt. The state has also flagged "lack" of manpower at the Darbhanga-based Indian Council of Agricultural Research — National Research Centre (ICAR-NRC) for Makhana and told the Centre it was in "bad shape".

#### PUNJAB SEEKS 100% CENTRAL FUNDING FOR CROP RESIDUE MANAGEMENT

Observing that burning of crop residue is an "important" issue, the AAP-led Punjab government on Thursday urged the Central government to restore the funding pattern for Crop Residue Management Scheme from 60:40 (Centre:State) to 100 per cent centrally funded.

— The state also asked the Centre to provide compensation to farmers for management of paddy stubble to tackle stubble burning menace and the resultant air pollution in Delhi NCR, Haryana and Punjab. It demanded that the Centre cover Rs 7,000 per acre to farmers who plant any crop other than paddy as part of the crop diversification plan (CDP).

— In the letter, Khuddian said: "To manage the residue, Crop Residue Management Scheme has been implemented in the state since 2018-19. From 2018-19 till 2022-23 the scheme was 100% centrally sponsored but in the year 2023-24 the funding pattern was changed to 60 (Centre):40 (State).

— For years, Punjab struggled with the problem of stubble burning, a practise that contributed to air pollution and posed a grave threat to the environment. However, in 2018, the state government initiated the groundbreaking Crop Residue Management (CRM) scheme, which was sponsored by the Centre until 2022.

— However, the state has started witnessing a positive trend in controlling stubble fires only this year after balers were promoted. The balers are designed to compress crop residue into compact



bales, making it easier for farmers to manage and transport paddy straw. Baler machines offer an additional source of income, as the compacted straw can be sold to various industries for different purposes.

## WHY ZOMATO, SWIGGY HAVE HIKED PLATFORM FEE BY 20% AND HOW IT COULD IMPACT CUSTOMERS

India's two major food delivery services, Zomato and Swiggy, have increased their platform fee to Rs 6 per order in key markets like Delhi and Bengaluru. The hike marks an increase of about 20 per cent, which customers will have to pay while purchasing food from these platforms.

The markets received the news positively, as seen in how Zomato's shares zoomed 4 per cent on Monday (July 15) to a new high of Rs 232. The firm earlier used to charge Rs 2 as a platform fee per order, and later increased it to Rs 5.

### **What is the platform fee on Zomato and Swiggy, and how does it impact customers?**

The platform fee is akin to the cost of shopping on these platforms. It is among the few ways companies can directly make money from users. Each time a person orders a food item on Zomato or Swiggy, they are levied this charge.

The companies have progressively raised their platform fees to improve their so-called 'take rates' – the amount of money they make on every order. It is one of the avenues in the supply chain which is directly under control of the companies, and is a major source of revenue for them. Other sources of revenue include advertising charges and commissions from restaurants.

For customers, it simply means more out of pocket expense while delivering from these apps.

### **Why is hiking platform fee important for them?**

The move comes as both the food delivery giants look to improve their unit economics further and give an overall boost to their revenues and profits.

The platform fee also becomes an important tool for these companies, because there is a ceiling till which they can charge commissions from restaurants. Currently, the commission varies from between 25-35 per cent depending on the restaurant, and this has been a major point of contention between them and the food delivery companies.

For restaurants, these apps have become a great way for discoverability, but many feel the visibility comes at a big cost. The unit economics of food services already has thin margins, and restaurants feel listing on Zomato and Swiggy could be a double-edged sword – if they are not on the apps, fewer people may purchase food for home delivery, but when they are on the app, they end up paying a large portion of their earnings to these delivery companies.

To account for the delivery companies' high commissions, restaurants, menu on their services often have inflated prices for the same food items, which is why things appear more expensive on these apps than they would be if one were to visit a restaurant and purchase food there.



## 6 LAKH FAKE POLLUTION-TRADING CERTIFICATES UNEARTHED IN 3 STATES

The Central Pollution Control Board (CPCB) in 2023 had unearthed more than six lakh fake pollution-trading certificates during audits at four plastic-recycling companies in Gujarat, Maharashtra and Karnataka, documents show.

Multiple sources from the Environment Ministry and from the plastic waste recycling industry confirmed to The Hindu that the potential number of fake certificates could be manifold as these were only four of the 2,348 plastic waste recyclers registered with the CPCB.

Only a small fraction of these recyclers has been physically verified for recycling the claimed quantity, sources said.

Between 2022 and 2023, the latest year for which information is available, there were about 18,000 companies that use plastic packaging and were registered with the CPCB, which manages the Extended Producer Responsibility (EPR) scheme, as either producers, importers or 'brand-owners'. They had a collective target of recycling about 3.3 million tonnes, with the Ministry data suggesting that on average, more than 85% of the target was met.

The Plastic Waste Management Rules mandate all companies that use plastic packaging to register with the CPCB. Not complying with these targets can invite fines.

These certificates, or EPR certificates, are used by thousands of companies that use plastic packaging in some form for business operations and are legally obliged to either ensure that a prescribed percentage of the plastic used annually is collected and recycled, or that they buy enough certificates to make good on their targets. The mandated targets change every year.

In 2022-23, for instance, companies were expected to recycle 70% of the packaging used in the previous two financial years. For 2023-24, it is 100%.

Certificates are generated by registered plastic waste recyclers, who collect plastic waste and recycle them. Every tonne of plastic recycled by them generates a certificate. As per a report by the CPCB this May, nearly 3.7 million tonnes worth of certificates were generated but given that companies have differing obligations, the exact number of certificates they buy from recyclers is not clear.

While 6,00,000 fake EPRs were bought by packaging companies as part of meeting their obligations, it is unclear who bought these certificates as the break-up is not publicly available.

The details vary, but the basic pattern in how recyclers produced fake certificates is similar. The four recycling companies, Enviro Recycleclean Pvt. Ltd (Karnataka), Shakti Plastics Industries (Maharashtra), Technova Recycling India Pvt. Ltd and Asha Recycleclean Pvt. Ltd, were hauled up for claiming to have generated many more EPR certificates than the installed capacity of their plants. The malpractice came to light after the CPCB conducted physical checks on their premises.

Certificates generated by recycling companies are considered legitimate only if the recyclers are actually able to sell the recycled plastic. In the case of these companies, they were unable to establish proof of these sales to the visiting CPCB officials.

The Maharashtra Pollution Control Board has, as on March 2024, ordered Technova to shut down following violations. The Hindu could not confirm if the other companies have got similar orders.



A typical notice, for instance to Technova, says: “The Unit has generated EPR certificates of the order of 97,200 tonnes and transferred certificates of 95,200... quantities mentioned in the invoices are fallacious and very high compared to the declared production capacity...”

## HOW IS INDIA’S HUNT FOR CRITICAL MINERALS GOING?

### The story so far:

In late June, the Centre declared the winning bidders for mining rights in six blocks of critical minerals, including graphite, phosphorite and lithium, for which India largely relies on imports. These are the first private players awarded such rights under the revamped Mines and Minerals law.

### Why are critical minerals important?

Minerals such as copper, lithium, nickel, cobalt are known as critical minerals, as they along with some rare earth elements, are essential for the world’s ongoing efforts to switch to greener and cleaner energy. As per the International Energy Agency (IEA), lithium demand rose by 30% in 2023, followed by nickel, cobalt, graphite and rare earth elements which saw an 8% to 15% growth, with the aggregate value of such minerals pegged at \$325 billion. In its Global Critical Minerals Outlook 2024 report, the agency has flagged that the world’s goal to limit global warming to 1.5 degrees Celsius in the net zero emissions scenario, would translate into very rapid growth in demand for these minerals. By 2040, the demand for copper is expected to rise 50%, double for nickel, cobalt and rare earth elements, quadruple for graphite and eightfold for lithium, which is crucial for batteries. The development of sustainable supply chains for such minerals is, therefore, an unavoidable task. In India, the lack of ready reserves of critical minerals has resulted in 100% import dependence for minerals like lithium, cobalt, and nickel. Late last month, Union Mines Minister G. Kishan Reddy highlighted that 95% of India’s copper requirements are met through imports. China is a key supplier or processor of many of these items.

### What is being done to spur production?

While India has natural reserves of some of these minerals, they haven’t been explored or tapped fully. For instance, India holds 11% of the world’s deposits of ilmenite, the main source of titanium dioxide used in many applications, but still imports a billion dollars of titanium dioxide a year, former Mines Secretary Vivek Bharadwaj once pointed out. Then there is the “lucky” discovery of lithium reserves in the Union Territory of Jammu and Kashmir (J&K) while the Geological Survey of India (GSI) was exploring the State’s terrain for limestone, which triggered hope of some self-sufficiency in the mineral. Announced as the first discovery of lithium in the country last February, these reserves were pegged at 5.9 million tonnes, enthusing the government to expedite its tapping.

Acknowledging that reliance on a few nations for the ores and processing of these minerals could pose significant vulnerabilities for Indian supply chains, the central government amended the Mines and Minerals (Development and Regulation) Act, 1957 in August 2023 to enable it to grant mining concessions for 24 critical and strategic minerals. By November, the first auctions of 20 critical mineral blocks, with the lithium block identified in J&K’s Reasi district on the list, were launched, followed by two more tranches with 18 more blocks offered this February and March. However, investor interest has been tepid — the auction of most of the first 20 blocks was scrapped for lack of adequate bidders. After a delayed process, the Mines Ministry on June 24,



announced six winners from the maiden auction tranche for three blocks in Odisha, and one each in Tamil Nadu, U.P. and Chhattisgarh. The outcomes of the second and third round of auctions are still awaited, while the Ministry has initiated a fourth tranche, which includes 10 blocks that are being offered for the second time.

#### **Why are some blocks not finding takers?**

Among the first attempt blocks offered in the latest auction, two phosphorite blocks along with a glauconite block are in Chhattisgarh, while two blocks each are up for grabs in U.P. (phosphorite and rare earth elements), Karnataka (phosphate and nickel), and Rajasthan (potash and halite). A graphite block is being auctioned in Jharkhand and Arunachal Pradesh, with five additional blocks of graphite, tungsten and vanadium offered in the northeastern State for the second time. The 'second attempt' blocks also include a tungsten reserve in Tamil Nadu's Madurai district, a cobalt and manganese block in Karnataka's Shimoga, and a chromium and nickel block in Sindhudurg, Maharashtra.

As per industry experts, the reasons for low interest among miners for some of these blocks include the lack of adequate data on the potential reserves buried within them. Technology challenges also affect outcomes. For instance, the lithium block in J&K has clay deposits, and the technology for the mineral's extraction from clay remains untested globally, pointed out Girishkumar Kadam, senior vice-president and group head for corporate sector ratings at ICRA.

#### **When is domestic production likely to begin?**

Given the preliminary stage of exploration for most of the domestic blocks being auctioned, their commercialisation and associated benefits are unlikely to fully accrue in the current decade ending 2030, ICRA said. "India's manufacturing is thus likely to remain exposed to potential future supply shocks of these minerals till then," it concluded. Apart from spurring exploration and attracting more miners, the Centre is looking to acquire overseas assets from key resource-rich regions as a parallel measure to bolster mineral security. The first such mine, for lithium brine, was acquired in Argentina this year by Khanij Bidesh India Limited, a joint venture of NALCO, Hindustan Copper, and Mineral Exploration Company. While it scouts for more assets, India has also joined the U.S.-led Mineral Security Partnership, a block consisting of large buyers and sellers of critical minerals.

# DreamIAS



## LIFE & SCIENCE

### WHAT CAUSED THE RARE FAILURE OF SPACEX'S FALCON 9 ROCKET

The US Federal Aviation Administration (FAA) on Friday grounded SpaceX's Falcon 9 — one of the world's most active rockets — after the failure of its upper stage engine that stranded 20 Starlink internet satellites in a low, non-survivable orbit. The failed mission ended a remarkable streak of more than 300 successful Falcon 9 flights in the last nine years.

#### What is Falcon 9?

Falcon 9 is a partially reusable rocket designed and manufactured by Elon Musk-owned SpaceX. It can transport crew and payloads to low Earth orbit (an altitude of 2000 km or less) and beyond.

The rocket has two stages. The first stage or booster stage comprises nine Merlin engines (a family of rocket engines developed by SpaceX), and aluminium-lithium alloy tanks containing liquid oxygen and rocket-grade kerosene propellant. The second stage consists of a single Merlin engine.

The first stage, which is reusable, is capable of re-entering the atmosphere, and landing vertically after separating from the second stage.

#### What went wrong with Falcon 9?

The issue occurred roughly 30 minutes after the launch of Falcon 9 from the Vandenberg Space Force Base in California on Thursday night. The rocket's second stage experienced a liquid oxygen leak, and failed to complete a second, short engine burn needed to put 20 Starlink satellites in the correct orbit, according to a post on SpaceX's website.

"After a planned relight of the upper stage engine to raise perigee — or the lowest point of orbit — the Merlin Vacuum engine experienced an anomaly and was unable to complete its second burn," SpaceX said.

"Although the stage survived and still deployed the satellites, it did not successfully circularise its orbit. This left the satellites in an eccentric orbit with a very low perigee of 135 kilometres (84 miles), which is less than half the expected perigee altitude."

SpaceX claimed that the stranded satellites do not pose any threat to other satellites, or public safety as they are expected to entirely burn up in the Earth's atmosphere.

The mishap occurred on the rocket's 354th mission, and marks the first Falcon 9 failure since 2015, when the rocket exploded on a launch site in Florida. Falcon 9 is considered one of the most successful and reliable rockets ever made.

#### What happens next?

The rare failure is expected to impede Falcon 9's launch pace. In 2023 alone, the rocket made 96 launches, and exceeded the annual launch total in any country, according to a report by Reuters. "By comparison, China, a space rival to the United States, launched 67 missions to space in 2023 using various rockets."

The grounding of Falcon 9 is also likely to postpone upcoming missions taking astronauts to orbit. The private Polaris Dawn mission spearheaded by the entrepreneur Jared Isaacman is slated for



the end of July. The rocket is also scheduled to take four astronauts to the International Space Station (ISS) for NASA in mid-August — Falcon 9 is the only US rocket capable of taking NASA astronauts to ISS.

The rocket will remain grounded till the time SpaceX investigates the cause of failure, fixes the issue, and gets approval from the FAA.

#### NOBEL LAUREATE SUPPORTS INDIA'S PURSUIT FOR A NEUTRINO LAB

If the obstacle-ridden India-based Neutrino Observatory (INO) ever becomes a reality, it will be one of the largest basic science projects in the country. Nobel laureate and neutrino researcher Takaaki Kajita is convinced that the proposed underground laboratory is still worth fighting for.

Neutrinos are abundant particles that may be relevant to our understanding of the origin of matter in the universe. About 60 years ago, historic science experiments inside a goldmine in Kolar, Karnataka, would lead to the 1965 discovery of atmospheric neutrinos. This was a collaboration between Indian, Japanese and British scientists.

Awakened to the potential of neutrino research, Japan continued with experiments on—or rather, under—their soil, in the underground Kamioka Observatory situated under Mount Ikeno. This was where Masatoshi Koshiba's team would discover cosmic neutrinos in the late 1980s. Subsequently, Japan decided to establish a dedicated neutrino observatory, Super-Kamiokande, which began operation in 1996. In 2002, Koshiba won a Nobel Prize for his contributions.

Indian scientists had no intention of being left behind. Though the original experiments had to end in 1992 due to the closure of the goldmines in Kolar, plans to build our own observatory were already underway. After extensive deliberations, a proposal was drawn and in 2011, the Indian government announced its intention to set aside about Rs. 1,350 crores for an India-based Neutrino Observatory, which would be situated 1.3 km underground in Tamil Nadu. Over a decade later, there has been no progress. Today, the fate of INO is uncertain.

Meanwhile, Japanese researchers received the first evidence for a phenomenon called neutrino oscillation within a year of the Super-Kamiokande. This discovery would go on to (jointly) win Koshiba's student Takaaki Kajita, another Nobel in 2015.

Having spent his entire research career in Japan, Takaaki Kajita is a living example of how much is to be gained by having a neutrino laboratory close to home. "We can easily access the laboratory and the detector is nearby," he said, in an interview with this reporter during the 73rd Lindau Nobel Laureate Meeting which concluded on July 5.

Two of the main reasons for opposition to INO are adverse environmental impacts and the fear of radioactivity. This is despite INO scientists repeatedly stating that the observatory would be located a kilometre underground and hence would have minimal impact on wildlife and the ecosystem. What about radioactivity? "The experiment will neither produce any radioactivity nor can it function well where there is radiation," they point out on INO's website. The whole point of housing the detector underground is to protect it from the natural radiation that hits the surface of Earth.

According to Kajita, the Japanese project did not face as much opposition. "We decided to construct the detector in an active mine, so there was no need for additional excavation," he pointed out. Besides, the original experiment was designed to search not for neutrinos but for a



hypothetical phenomenon called proton decay. “That was nothing to do with radiation,” he said. The biggest stroke of luck for the Japanese neutrino scientists was the timing of a supernova that was observed in February 1987. The Supernova 1987A happened while the Kamiokande-II detector was online, leading to the discovery of cosmic neutrinos by the team led by Koshiba. “This had a great impact. People suddenly knew neutrinos, and had only a good image about them,” said Kajita, who was Koshiba’s PhD student.

## GLITCH IN SOFTWARE UPDATE MAY HAVE TRIGGERED GLOBAL MICROSOFT-CROWDSTRIKE OUTAGE: EXPERTS

In the early hours of Friday, reports emerged that Microsoft’s Azure cloud service was facing an outage, affecting users in the Central U.S. area. Within the next few hours, the service outage spread like wildfire to several other countries, including India, disrupting flight operations and air traffic, forcing airports to shift to manual operations. Brokerages and stock exchanges were also hit, throwing digital lives of many out of gear.

The Indian Computer Emergency Response Team (CERT-In) issued a severity rating of “critical” for the incident.

### What caused it?

Microsoft, while acknowledging the outage in a blog post, noted that “Virtual Machines running Windows Client and Windows Server, running the CrowdStrike Falcon agent, may encounter a bug check”.

The tech giant estimated that the approximate time of impact could be as early as 4.09 a.m. UTC (9.39a.m. IST) on Thursday, when this update started rolling out.

While Microsoft has not fully revealed what caused the outage, one incident seems to have triggered this cyberevent — a glitch in the software update of Falcon Sensor, the endpoint protection programme of CrowdStrike.

CrowdStrike is a cybersecurity firm that deploys unified security programmes to stop breaches in real time. The Falcon Sensor platform runs with high privileges and is built to protect endpoints (basically, any devices connected to a computer network). A mishap in this security platform can cause the operating system to crash, like what several users faced globally on Friday with the Blue Screen of Death (BSOD). Once BSOD flashes on a user’s screen, they will be caught in a boot loop cycle, which simply means that they won’t be able to access their devices linked to CrowdStrike’s Falcon platform.

### What is BSOD?

BSOD is a warning that users see on their computer when the system interrupts operations and displays it on a blue screen. This is what many users saw on Friday when they tried to access their devices. Officially referred to as the “Stop Error”, the warning is issued when a critical problem forces Windows to reboot. Before rebooting, the Windows operating system saves a file on the computer, carrying data about the error. This file is called a ‘minidump’ and is crucial for determining the cause of the error.





### What caused the glitch?

According to CyberArk's CIO, Omer Grossman, there are range of possibilities, starting from "human error — for instance, a developer who downloaded an update without sufficient quality control — to the intriguing scenario of a deep cyberattack, prepared ahead of time and involving an attacker activating a "doomsday command" or "kill switch". And it is anyone's guess until CrowdStrike's own analysis and updates are out in the coming days. Alternatively, the software update made by CrowdStrike could have conflicted with the changes introduced in the latest Windows update, CYFIRMA's CEO, Kumar Ritesh, pointed out.

The latter could be a good area to probe into as other cloud service providers, like Google Cloud or Amazon Web Services (AWS), did not suffer any outage. It is also important to note that both Google and Amazon have built their cloud platform on Linux.

### How did it hurt?

Thousands of users opened their devices to see BSOD as many people faced delays and disruptions at the airport.

In the past when businesses faced such outages and cybersecurity breaches, often carried out by foreign attackers, Microsoft addressed them with confident optimism. However, on Friday, as users across the world struggled with simple tasks such as making digital payments or found themselves stranded in airports, there was growing fear and frustration. Computer emergency response teams worldwide quickly tried to ascertain if the IT outage was the work of cybercriminals or even state-backed hackers. The outage seriously impacted Microsoft's users ranging from airports, airlines, financial institutions, and hospitals, down to office workers and casual Internet users trying to log into their Microsoft apps or devices.

### Current status of outage

The situation is gradually returning to normal, with CrowdStrike sharing that a fix had been deployed.

"CrowdStrike is actively working with customers impacted by a defect found in a single content update for Windows hosts. Mac and Linux hosts are not impacted. This is not a security incident or cyberattack. The issue has been identified, isolated and a fix has been deployed," CrowdStrike CEO George Kurtz said on X.

However, with even the White House tracking the situation, both Microsoft and CrowdStrike will have many difficult questions to answer in the coming days.

## AS THOUGHTS BECOME DIGITISED, WHO WILL PROTECT OUR NEURORIGHTS?

Neurotechnologies have come a long way since the development of electroencephalography (EEG). Invented a hundred years ago, the EEG has had a significant impact on our knowledge of the human brain and various treatments of brain disorders. Many researchers expect that soon there will be wearable EEGs that could directly assist human cognitive functions. Elon Musk's Neuralink has also kindled hope about using brain-computer links to help physically impaired people restore some lost function.

The 1990s was popularly known as the 'decade of the brain' as research on neuroscience and neurotechnologies received a big boost from various governments. The European Union's 'Human



Brain Project' and the subsequent 'BRAIN' initiative were some of the major initiatives. Today, research in these areas is also supported by private companies, especially in the life sciences sector, and is also more extensive than before, including brain pathophysiology, deep-brain stimulation, and neuromarketing.

Neurotechnologies range from Magnetic Resonance Imaging (MRI) that health workers routinely use to the rarer Brain-Computer Interfaces (BCI). In the last few decades, the type of sensory information these technologies have become able to record has expanded considerably. Sophisticated biosensors that can record a person's physiological activities, behavioural responses, and emotions are no longer fiction.

#### **How is neurodata valuable?**

The digitisation of neuro-data raises great opportunities as well as concerns. Not all neurotech users are care-seekers, as smartwatches, apps, and 'embeddables' are integrated more into day-to-day activities. After users' devices collect these data, there will be an option to transmit them to healthcare providers and private companies, who will have an incentive to integrate them in a larger knowledge framework to offer, say, real-time tracking of health indicators and personalised suggestions.

This also increases the risk of surveillance — from multiple sources for different purposes. For example, a manager can monitor the movements and mental states of an employee to track alertness, fatigue, and other indicators. This data can be shared with various state and non-state actors, including other employers and physicians. This can be a boon but can also help these actors exert more control over individuals' behaviour. Digitised health data also has great commercial value in advertising and marketing (including neuromarketing).

Surging investment by the private sector in neurotechnologies has also raised concerns about their governance and regulation. There are unique ethical concerns here because these neurotechnologies can probe individuals' physiological and psychological states.

Ultimately the right to think freely and mental privacy can be imperilled. In the garb of monitoring and assessing efficiency, different entities may be able to track and monitor the movements and behaviour of diverse sections of the population, individually and collectively.

#### **What is neuroethics?**

The right to think freely and the right to safeguard one's mental statuses and thoughts from surveillance and monitoring are precious fundamental rights but technological advancements may cheapen them in some contexts. Experts strive to adopt ethical standards such that humankind benefits most from the use of neurotechnologies while minimising harm. This is the principal concern of neuroethics. It has emerged as an important field of research and action in the last two decades.

Various institutions and funding agencies have tried to identify and enforce ethical principles for neuro-X research and development. In 2015, the U.S. Presidential Commission on Bioethics published a two-volume report entitled 'Gray Matters'. It focused its analysis on three "controversial topics that illustrate the ethical tensions and societal implications of advancing neuroscience and technology: cognitive enhancement, consent capacity, and neuroscience and the legal system".



In 2019, the Organisation for Economic Co-operation and Development (OECD) recommended nine principles to ensure the ethical development and use of neurotechnologies based on the concept of responsible innovation. Two of them were “safeguarding personal brain data” and “anticipating and monitoring potential unintended use and/or misuse”.

UNESCO published a paper in 2022 in which it said: “As [neurotech] actively interacts with, and alters the human brain, this technology also raises issues of human identity, freedom of thought, autonomy, privacy and flourishing. The risk of unauthorised access to the sensitive information stored in the brain is a case in point. Already today, neural data is increasingly sought after for commercial purposes, such as digital phenotyping, emotional information, neurogaming and neuromarketing. Neuromarketing units have been developed by industry to evaluate, and even alter consumer preferences — raising serious concerns about mental privacy. These risks can also pose serious problems when dealing with non-democratic governments.”

In 2023, researchers at the Institute of Neuroethics in Atlanta in the U.S. reviewed several guideline documents and ethical frameworks published by institutions, think-tanks, governments, etc. worldwide. Among other things, they wrote, these texts ask researchers to “proactively consider and communicate potential implications of scientific advances” and “to improve and meaningfully incorporate ethics in training and the conduct of research”.

#### **What are your neurorights?**

Internationally accepted human rights principles and the Universal Declaration of Human Rights provide some inkling as to individuals’ neurorights. But the extent to which they are enforceable depends on the laws in each jurisdiction.

In 2021, Chile became the first country to legally recognise its citizens’ neurorights when its Senate agreed to amend the constitution. As a result, according to a 2022 article in the journal *AI & Society*, technological developments in the country must “respect people’s physical and mental integrity” and its laws should “protect brain activity and information related to it”. In the U.S., Colorado enacted a law in April 2024 to protect individuals’ neurological privacy while California is deliberating a similar instrument.

But some legal scholars have said the current rights framework is adequate and that laws specific to neurorights may be limited in scope. For example, in a paper published last year in the journal *AJOB Neuroscience*, Pennsylvania State University scholars discussed whether neuro-privacy is meaningfully separate from data privacy.

An important challenge to developing suitable neuroethical standards is that the underlying technologies are evolving rapidly. The contexts in which people use these technologies are also diverse, beset by disparate expectations and cultural norms. For now, UNESCO has appointed an expert group to develop the “first global framework on the ethics of neurotechnology”, expected to be adopted by the end of 2025. While this framework is not likely to result in a treaty or a binding convention, it could have a major impact on governments’ guidance documents and policy narratives. Apart from UNESCO, various intergovernmental organisations are also actively working on the human rights dimension of neurotechnologies.

### **100 YEARS OF EEG: HOW DOES IT WORK AND WHAT IS ITS SIGNIFICANCE?**

The EEG is a marvel of physics and neurobiology that opens a simple window into the human brain. This window is often small and yet it reveals so much. But not least is the wonder that it



reveals anything at all without having to break open the skull first. This year is the centenary of the first human EEG, produced by German physiologist Hans Berger.

#### **How was the EEG invented?**

Berger's feat was preceded by incremental but significant advances across Europe from the late 19th century. In 1875, British physician Richard Caton reported evidence of electrical activity in the brains of monkeys and rabbits. Fifteen years on, his Polish peer Adolf Beck found evidence of fluctuating activity in the brains of dogs and rabbits when he stimulated their senses. In 1912, Vladimir Pravdich-Neminsky produced the first mammalian EEG, of a dog's brain. Berger succeeded him in 1924 with the human counterpart. He is also credited with inventing the EEG, naming it, and introducing its utility in clinical settings.

#### **What is an EEG?**

EEG stands for electroencephalography. 'Electro' pertains to electricity; 'encephalo' refers to the brain; and 'graphy' is a suffix meaning to show or to represent. Neurons in the brain perform various functions by moving electrically charged particles such as ions. The movement of these particles gives rise to electrical activity that a health worker can use an EEG test to visualise. Researchers have also been able to relate data obtained from an EEG with different levels and modes of brain activity, and used it to distinguish reliably between normal and abnormal states.

EEG is not an uncommon diagnostic test in clinical settings. Among other applications, it is the reference standard — that is, the best test available — to diagnose epilepsy. An EEG test can also reveal the effects of anaesthesia, sleeping patterns, neurological activity during a coma, and availability of oxygen. EEG can also confirm brain death, one of the two legally recognised forms of death in India.

In research, scientists use EEG for neuroscience, cognitive psychology, neurolinguistics, neuromarketing studies and to develop brain-computer interfaces.

#### **What is volume conduction?**

EEG measures electrical activity in the brain generated by neurons. During an EEG test, a health worker will place electrodes on your scalp. There are many layers of skin, fluid, and bone between the electrodes and the neurons. When a neuron produces electrical activity, charged particles will move through all these media before reaching the electrodes, and will be reflected, refracted, scattered, etc. en route.

Volume conduction refers to the movement of electrical activity through this three-dimensional volume. It also stands for the fact that the electrical activity is produced in one place whereas the detectors that detect it are located at some distance. The raw data collected by the electrodes will first need to be corrected for the effects of volume conduction, and then for noise in the data arising from faulty electrodes and incidental physiological activity (such as blinking or muscle activity). A clinician finally interprets the processed data.

#### **How does an EEG test work?**

The neurons that make up the human brain are constantly exchanging atoms, molecules, proteins, etc. with their surroundings. Sometimes neurons will push ions out into the space between neurons. Since ions of the same charge repel each other, this 'motion' can push away other ions, which push away even other ions, and so on.



When a large number of neurons start this cascade at the same time, a (relatively) big wave of electrical activity flows through the brain. The electrodes on the scalp are made of metal and track the changes in voltage as the waves move past them, creating an electroencephalogram.

#### **Where are the electrodes placed?**

You can place them anywhere, but if you're comparing notes with a scientist or want to follow clinical standards, you should follow the International 10-20 System.

In this system, the distance between two adjacent electrodes is either 10% or 20% of the total distance between two points on the head along which electrodes are being placed.

Four common points of reference are the nasion (the depression between the eyes, just above the bridge of the nose) and the inion (the crest at the back of the skull) going front to back, and from tragus to tragus going side to side. (The tragus is the small flap-like projection on the outer ear; you push it in to shut your ears when there's a loud noise.)

#### **What does and doesn't EEG show?**

The changes in voltage recorded at the electrodes are transmitted to a computer, which plots the readings on a graph with voltage on one axis and time passed on another. Health workers are typically interested in two types of data in the graph: the voltage (measured in millionths of a volt) and the frequency of the variations (measured in hertz). They will also factor in, among other things, the location of the neurons responsible for the electrical activity recorded by the test (for example, in the neocortex or the allocortex, the two types of cortices of the cerebral cortex).

EEG is better than other diagnostic devices at tracking relatively rapid electrical activity in the brain, in the order of milliseconds. On the downside, it is biased towards electrical signals generated closer to the surface of the cortex, and significantly so towards currents generated by neurons' dendrites and against those generated by the axons. The process to pinpoint where some electrical activity originated within the brain, to result in some electrical data, is also less than straightforward.

To overcome these and other challenges, researchers have used EEG together with other tests, like magnetic resonance imaging (MRI), and have developed sophisticated data acquisition, processing, and reconstruction methods.

#### **Are EEGs affordable?**

Aside from its metrological and diagnostic abilities, an EEG setup is also relatively simple and cost-effective.

The equipment involved doesn't take up much space, doesn't emit high-energy radiation or sounds, doesn't confine patients to small spaces (like MRI), is non-invasive, and is portable (the invasive version of EEG is called electrocorticography, or ECoG).

Similarly, aside from its diagnostic downsides, setting up an EEG test requires time — including applying a gel on the person's head and placing the electrodes in precise locations according to the 10-20 System — and its readings can be affected if the person has so much as thicker hair.



## THE ABO CLASSIFICATION SYSTEM

### How are blood groups differentiated?

A: Human blood consists of red blood corpuscles as a constituent, which give it its red colour. On the surfaces of these red cells are present one or both of two types of antigens (proteins), designated A and B. Other than these, two antibodies, designated as antibody-A and antibody-B, present in the serum are also involved in the classification of human blood. (Serum, a constituent of blood, is a straw-coloured liquid that can be seen after removing all the other blood cells from a sample.)

Antibodies have the property of clumping red cells. When antigen-A is present on the red cells, the serum contains only antibody-B, which will clump red cells with antigen-B on their surface. Then the blood is classified as group A.

When antigen-B is present on the red cells, the serum contains only antibody-A, which clumps red cells with antigen-A. As a result, the blood is classified as group B.

In some people, both antigens A and B are present on all the red cells, so their serum does not contain any of the antibodies. They belong to the AB group. Their blood cells don't clump whether they receive A group or B group blood. That is, A and B are compatible with the AB group.

The fourth type, O, has neither of the antigens on its red cells but has both antibodies in the serum.

In order to keep red cells from clumping, those with A group blood can receive only A and O group blood, and those with B group blood can only receive B and O group blood. But the AB group can receive blood from any of the groups. Thus, it is called the universal recipient. Similarly, those with O-group blood are universal donors.

This system of classification is called the ABO system. Blood groups are also classified by the Rhesus system (Rh). The Rh factor leads to one type in which the Rh factor is present (Rhesus positive) and another in which it is not (Rhesus negative).

## WHY RECENT SIGHTING OF PERU'S UNCONTACTED MASHKO PIRO PEOPLE IS CONCERNING

Indigenous rights NGO Survival International has released rare pictures of the Mashco Piro tribespeople, one of the world's 100-odd uncontacted tribes.

The photographs taken late in June show more than 50 tribespeople on the banks of a river, close to where logging companies have been granted concessions.

"These incredible images show that very large numbers of uncontacted Mashco Piro people are living just a few miles from where loggers are poised to start operations... This is a humanitarian disaster in the making," Caroline Pearce, director of Survival International, said.

### The uncontacted tribe

Almost all of them live in the jungles of Amazon and Southeast Asia. The Mashco Piro, possibly numbering more than 750, are believed to be the largest of such tribes. These nomadic hunter-gatherers live in the Amazon jungles of the Madre de Dios Region, close to Peru's border with Brazil and Bolivia.



Peru's government has forbidden all contact with the Mashco Piro, fearing the spread of a disease among the population to which it has no immunity. The tribe is very reclusive, only occasionally contacting the native but contacted Yine people. Much of what is known about the Mashco Piro comes from Yine accounts

### **Logging in the forest**

In 2002, the Peru government created the Madre de Dios Territorial Reserve to protect the territory of the Mashco Piro. But large parts of their traditional ground lie outside the reserve. Swathes of land have since been sold off as logging concessions, giving companies the right to fell the evergreen forests for timber and other produce.

The most prominent logging company, Canales Tahuamanu, has been allotted an area of 53,000 hectares in the forests of Madre de Dios to extract cedar and mahogany by Peru's Forest Stewardship Council (FSC). Canales Tahuamanu has aggressively defended its logging rights, and clamped down on critical voices in courts.

The Mashco Piro themselves have expressed their disapproval of the logging companies to the Yine. "... Since there have been logging concessions, they [the Mashco Piro] feel increasingly pressured and upset because the companies have assaulted them," a Yine person told Survival International.

### **Tribe has nowhere to go**

This is, however, not the first time that Mashco Piro territory has been invaded. In the 1880s, during Peru's rubber boom, the Mashco Piro were among the many tribes who were forcibly displaced from their land, enslaved, and killed en masse. The survivors moved further upstream on the Manu river, where the Mashco Piro have lived in isolation ever since.

Now, as logging companies encroach into their territories, experts say they have nowhere left to go. That is why the number of sightings has risen in recent years, with the Mashco Piro coming out of their forested havens not only to find food and supplies, but also to "flee" the outsiders.

They have even been sighted across the border in Brazil. "They flee from loggers on the Peruvian side... They are a people with no peace, restless, because they are always on the run," Rosa Padilha, of the Brazilian Catholic bishops' Indigenous Missionary Council, told Reuters.

## **WORLD'S RAREST WHALE MAY HAVE WASHED UP ON BEACH IN NEW ZEALAND**

The spade-toothed whales are the world's rarest, with no live sightings ever recorded. No one knows how many there are, what they eat, or even where they live in the vast expanse of the southern Pacific Ocean. However, scientists in New Zealand may have finally caught a break.

The country's conservation agency said Monday a creature that washed up on a South Island beach this month is believed to be a spade-toothed whale. The five-meter-long creature, a type of beaked whale, was identified after it washed ashore on Otago Beach by its colour patterns and the shape of its skull, beak, and teeth.

"We know very little, practically nothing about the creatures," Hannah Hendriks, Marine Technical Advisor for the Department of Conservation said. "This is going to lead to some amazing science and world-first information."



If the cetacean is confirmed to be the elusive spade-toothed whale, it would be the first specimen found in a state that would permit scientists to dissect it, allowing them to map the relationship of the whale to the few others of the species found, learn what it eats, and perhaps lead to clues about where they live.

Only six other spade-toothed whales have ever been pinpointed, and those found intact on New Zealand's North Island beaches had been buried before DNA testing could verify their identification, Hendriks said, thwarting any chance to study them.

This time, the beached whale was quickly transported to cold storage, and researchers will work with local Maori iwi (tribes) to plan how it will be examined, the conservation agency said.

New Zealand's Indigenous people consider whales a taonga — a sacred treasure — of cultural significance. In April, Pacific Indigenous leaders signed a treaty recognising whales as "legal persons," although such a declaration is not reflected in the laws of participating nations.

Nothing is currently known about the whales' habitat. The creatures deep-dive for food and likely surface so rarely that it has been impossible to narrow their location further than the southern Pacific Ocean, home to some of the world's deepest ocean trenches, Hendriks said.

"It's very hard to do research on marine mammals if you don't see them at sea," she said. "It's a bit of a needle in a haystack. You don't know where to look." The conservation agency said the genetic testing to confirm the whale's identification could take months.

It took "many years and a mammoth amount of effort by researchers and local people" to identify the "incredibly cryptic" mammals, Kirsten Young, a senior lecturer at the University of Exeter who has studied spade-toothed whales, said in emailed remarks.

The fresh discovery "makes me wonder — how many are out in the deep ocean and how do they live?" Young said.

## GLIMPSES OF LUCA, THE LIFE-FORM FROM WHICH ALL OTHER LIFE DESCENDED

As mysteries go, a close second to the origin of life is how life-forms started to evolve. Researchers believe bacteria, archaea, and eukarya all originated from the last universal common ancestor. There is no fossil evidence of its existence, but the fact that modern genomes share so many features provides some clues

The origin of life on earth is one of the world's most enduring mysteries. There are a number of competing theories, but all of them lack conclusive proof. Nonetheless, scientists widely believe a combination of geological, climatic, and chemical processes gave rise to the building blocks of life.

In the 1920s, Alexander Oparin and J. B. S. Haldane independently proposed their origin theories — the first of their kind. In 1924 and 1929, Oparin and Haldane, respectively, suggested the first molecules making up the earliest life forms gradually self-organised from a "primordial soup" in a young earth's tempestuous, prebiotic environment. This idea is today called the Oparin-Haldane hypothesis.

Researchers have also conducted biochemistry experiments and found evidence to support this hypothesis. A particularly famous one was the Miller-Urey experiment in 1952, in which University of Chicago researchers Stanley Miller and Harold Urey showed that in the right conditions, inorganic compounds could give rise to complex organic compounds. Miller and Urey





mixed methane, ammonia, and water, and when they applied a strong electric current — like a lightning strike might have — the mixture contained amino acids, the building blocks of proteins. They reported their discovery the very next year in the journal *Science*.

While we have evidence today that the earth's environment then may not have been much like what the experiment presumed to mimic, the very fact that amino acids could be created in a broth of inorganic molecules was groundbreaking.

Other researchers have proposed other theories about the origin of life. A particularly prominent one is that meteorites from space could have brought the building blocks of life, sustained by discoveries on the earth as well as out there. In August 2019, French and Italian scientists reported discovering extra-terrestrial organic material 3.3 billion years old, whereas Japan's Hayabusa 2 mission to the asteroid Ryugu indicated the presence of more than 20 amino acids there.

### **LUCA and the molecular clock**

As mysteries go, a close second to the origin of life is how life-forms evolved to produce the rich diversity we see around us today. Researchers believe all three branches of life — bacteria, archaea, and eukarya — originated from a single cell, called the last universal common ancestor (LUCA). There is no fossil evidence to support the existence of LUCA, but the fact that modern genomes share so many features provides some insights. An important concept that allows scientists to reconstruct the 'tree of life' is the theory of the molecular clock. Molecular biologist Emile Zuckerkandl and biochemist Linus Pauling proposed it in the 1960s, and biologist Motoo Kimura subsequently improved it.

According to a simplified version of the theory, the rate at which mutations are added or removed from a population's genome is proportional to the rate of acquiring new mutations, which is constant. Later studies also found that the mutation rate varies between species. Using these two facts, researchers developed a way to estimate how much time could have passed between two evolutionary events.

To calibrate the molecular clock to a particular rate of mutations, researchers establish links between a genome and known events, such as the 'date' on which the first mammal evolved or the age of certain fossils. These links act like temporal benchmarks.

Thanks to the large number of genome sequences and fossils of various organisms, as well as the computing power available today, researchers routinely use the molecular clock to understand the evolution of various life-forms on earth through time.

### **Which is older: LUCA or fossils?**

In a recent paper in the journal *Nature Ecology and Evolution*, researchers at the University of Bristol and Exeter in the U.K. constructed a phylogenetic tree of 350 bacterial and 350 archaeal genomes. Then, using a molecular clock, the team estimated when LUCA could have originated: around 4.2 billion years ago, just 300 million years after the earth itself formed.

The team also reported that LUCA may have had a small genome, of some 2.5 million bases and encoding around 2,600 proteins, all just enough to help it survive in a unique environmental niche. The team also suggested the metabolites produced by LUCA — compounds produced as a result of its metabolism — could have created a 'secondary' ecosystem in which other microbes could have emerged.



Importantly, the origin of LUCA by 4.2 billion years significantly predates previous suggestions about the origin of life on earth. For context, researchers have found fossil records of the earliest life-forms in the Pilbara Craton in western Australia, one of the few places on the planet where archaean rocks are exposed aboveground and accessible. Studies of these fossils have suggested that life that lived on the rocks emerged around 3.4 billion years ago. The current study, on the other hand, pushes this date back by almost a billion years, almost on the heels of the birth of our planet itself.

The researchers also found some reasons to believe LUCA may have had genes responsible for immunity, suggesting it had to fight off viruses.

Taken together, the findings are tremendously significant, not just for understanding how life emerged and evolved on the earth: they also speak to our ability to look for similar forms of life across the universe. The insights into evolution they provide will also give a significant fillip to human ambitions to engineer synthetic organisms for various industrial, chemical, and biological processes on the earth, as well as to create or moderate ecosystems on other planets in the future.

### SCIENTISTS FIND THAT A BACTERIA TRICKED A WASP TO GET RID OF ITS MALES

A hundred years ago, two American researchers named Marshall Hertig and Simeon Burt Wolbach discovered that mosquitoes harboured bacteria within their cells. Other researchers later found similar bacteria in the cells of most insects and many other arthropods. The genus to which the bacteria belonged was named *Wolbachia*.

*Wolbachia* bacteria are also present in insect eggs, but they are absent in the sperm. This means females can transmit *Wolbachia* to their offspring, whereas males can't — from the bacteria's point of view, an evolutionary dead end. As a result, *Wolbachia* have evolved ways to manipulate their insect hosts to produce more female than male progeny.

A new study reports that the bacteria may have taken it a bit too far this time. Researchers from Shenyang Agricultural University (SAU), China, published a paper in the June 3 issue of the journal *Current Biology* showing that *Wolbachia* bacteria had manipulated the wasp *Encarsia formosa* to entirely get rid of its males.

#### The farmer-friendly Amazon

*E. formosa* wasps are of interest to agricultural scientists because they provide an efficient way to control whiteflies. Whiteflies feed on the sap of plant leaves, causing productivity losses, and are thus a major agricultural pest. Whiteflies belong to the insect order Hemiptera, whereas wasps belong to the insect order Hymenoptera. The wasp seeks out the nymphs (or larvae) of whiteflies and lays its eggs on them. When the eggs hatch, the larvae that emerge penetrate the nymph, feed on its tissues, grow to adulthood, and in the process kill the nymph.

The progeny wasps emerge from the nymph's carcass. As a parasitoid of whiteflies, the female wasp is in effect a search and destroy weapon. The male wasps are superfluous in this role.

#### Doubling up with *Wolbachia*

Generally, among hymenopterans such as ants, bees, and wasps, the eggs fertilised by sperm cells develop into females, while unfertilised eggs develop into males. The males contain only one set of chromosomes, derived from the egg, and are thus said to be haploid. In contrast, the females



are diploid because they contain two sets of chromosomes: one set derived from the egg and the other from the sperm.

The females use a specialised form of cell division called meiosis to transmit only one set of chromosomes to their eggs, while the males transmit their single chromosome set to all of their sperm by the more general cell-division process called mitosis. This, in a nutshell, is how haplo-diploid sex determination works.

The SAU researchers noticed that in the wild, the *E.formosa* wasp almost never produced males.

In the laboratory, however, they found that if the female wasp was treated with an antibiotic (usually tetracycline), almost 70% of the progeny were male.

(They are easy to identify with the eye. The females are tiny — about 0.6mm long — and are black with a yellow abdomen; the males are only slightly larger but completely black.)

The reason for this was that antibiotic treatment reduced the titre, or concentration, of the *Wolbachia* bacteria. As a result, the chromosome number remained undoubled and the eggs developed into males.

That is, normal titres of *Wolbachia* bacteria could induce unfertilised eggs to somehow double the chromosome number and enable the development of female wasps. We don't yet know how the bacteria do this, but again, this action rendered the males superfluous.

The findings are of interest even to scientists whose primary interest is not whitefly control.

#### **A coleoptera gene to the rescue**

A gene named *tra* has an evolutionarily conserved role in promoting female development in insects. ('Evolutionarily conserved' means all insects have it.) That is, if the *tra* gene mutates, cells won't be able to make a functional *Tra* protein, and progeny development proceeds along the default mode towards male production.

The SAU researchers found that the *tra* gene in the *E. formosa* genome was missing some 'pieces' important for its function. How then did the female wasps develop?

The researchers found the genome of the wasp's *Wolbachia* bacteria contained a functional version of *tra*. Ordinarily, bacteria don't have any reason to possess a *tra* gene. But the wasp's *Wolbachia* acquired one from a distantly related insect, one belonging to the order coleoptera, which includes beetles. That is, the bacteria had acquired the gene through horizontal gene transfer.

Having lost its own *tra* gene, the *E.formosa* wasps had to rely on their *Wolbachia*'s *tra* gene to allow their eggs to develop into females. This is the first example of a bacterium using a horizontally transferred gene to manipulate female production in an insect.

#### **No males, no species**

The males produced by the SAU researchers after antibiotic treatment didn't mate with females and didn't inseminate them. This could be because the males were absent from *E.formosa* populations for so long that they have now lost their ability to mate. An alternative possibility is that the inability to mate was an unintended consequence of antibiotic treatment.



To resolve these two possibilities, scientists will now need to examine those rare naturally produced males to know whether at least a fraction of them can engage in sex with females. If sexual exchange is absolutely missing in the wasp, the species will no longer have the ability to purge bad mutations that accumulate in its genome. In this case, the wasp-Wolbachia duo faces a relatively early extinction.

The Wolbachia bacteria were shown to be smart enough to double the chromosome number in their host's unfertilised eggs and to supply them with tra. But are they also smart enough to occasionally allow a few males to emerge and enable sexual exchange and thus delay their own extinction?

## PALIMPSEST: A HISTORIC EMBLEM OF REUSE

### WHAT IS IT?

For a major part of history, people used parchment to write. Parchment was a writing material made from the untanned skins of animals, especially goats. Since it was expensive in many parts of the world, people often scraped or washed off any existing text on parchment and reused it to write. Any page that has been reused in this manner is called a palimpsest.

Writers used many methods to remove existing text from parchment. Until the early Middle Ages, they used milk and oat bran. Older text would often reappear on palimpsests washed in this way and such text was called underwriting. Contemporary scholars have often been able to decipher the underwriting to reveal otherwise inaccessible historical texts; they are also beginning to use machine learning to glean more information from it. Towards the late mediaeval period, writers turned to scraping text away with pumice, permanently 'deleting' it.

Many a famous textual work has survived only as palimpsests, including the Sana'a palimpsest, the Archimedes palimpsest, and Cicero's 'De re publica'.

Other scholars have adopted this word to refer to analogous instances in their fields of study. For example, in astronomy, palimpsests refer to craters on planetary bodies — like other planets and moons — that have become eroded to barely resemble one. A palimpsest in geology is a natural feature created by different structures forming at the same location at different times.

## HEART RATE

### What is the maximum heart rate of male noctule bats?

To record the heart rate of male common noctule bats during flight, the scientists attached heart rate transmitters weighing less than one gram to the animals, which they then accompanied in an airplane while the bats flew, sometimes for more than an hour, in search of food. The researchers found that the heart rate of bats reaches around 900 beats per minute within only a few minutes during flight. Using the unique recordings of heart beats, the scientists discovered fascinating strategies that bats use to budget their energy consumption in different seasons. They found that male common noctule bats consume up to 42% more energy in summer compared to spring. This is mainly due to the fact that the bats in spring go into a kind of short daytime hibernation known as "torpor"—an energy-saving state in which heart rate can be reduced to six beats per minute. Male bats did not use torpor in summer at all. In summer, food is plentiful and so males stay awake during the day to invest energy in sperm production.