



CURRENT AFFAIRS for UPSC

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DreamIAS



INTERNATIONAL

GLOBAL WATCHTOWER

The Comprehensive Nuclear-Test-Ban Treaty Organization (CTBTO) grew from the campaign to close the last legal gap in nuclear restraint: a global, verifiable ban on all explosions. The UN General Assembly adopted a draft treaty to this end in September 1996 and opened it for signatures. Because entry into force required 44 named Annex 2 states with nuclear expertise to ratify it, governments created a Preparatory Commission in November 1996 to build and provisionally operate a verification regime before the treaty 'began'.

This verification regime is the CTBTO's principal political capital. It banks on the International Monitoring System (IMS), a network of 337 facilities combining seismic, hydroacoustic, infrasound, and radionuclide stations to continuously search for nuclear tests around the world. The International Data Centre harmonises and analyses these signals.

By running a global sensor network, the CTBTO created a de facto verification regime that helped sustain the moratorium on nuclear explosive testing that has held for all states (except India, Pakistan, and North Korea). It has also expanded the IMS's scientific uses, including for tsunami warnings, rendering its abrupt abandonment costly. However, the treaty itself remains in legal limbo. Most states have signed and ratified it but its enforcement still hinges on the eight Annex 2 holdouts. In 2023, Russia also revoked its prior ratification while pledging to continue observing the testing moratorium.

Against this backdrop, U.S. President Donald Trump's threat to restart nuclear testing, framed as regaining "equal" footing with Russia and China, poses immediate and longer-term risks for the global test ban. Analysts have noted that any U.S. return to explosive testing would invite reciprocal tests by other nuclear-armed states and complicate the CTBTO's political mission.

Significant hurdles still stand in the way of a U.S. nuclear test. The Nevada site's explosive testing infrastructure and workforce are in need of substantial refurbishment; even proponents have conceded that preparing an underground test would take time and considerable funds. An aboveground test would collide with the country's obligations under the 1963 Partial Test Ban Treaty and incur terrible environmental costs.

The U.S. remains a CTBT signatory and successive administrations have certified its stockpile without explosive tests while trackers such as SIPRI have documented processes to modernise it. If Washington were to test, thus, it would reduce the odds of ever meeting the CTBT's threshold for entering into force by hardening opposition among non-ratifying states and undermining coalitions in favour of the treaty.

For the CTBTO itself, the immediate impact of a renewed U.S. test would be paradoxical. While the system would perform as designed — detecting, locating, and characterising the event and disseminating data worldwide — the same success would coexist with damage to the organisation's *raison d'être*. That is, an explosive test by the treaty's most visible non-ratifying signatory would signal that the moratorium is contingent and feed arguments that it may never enter into force. Thus, while the rise of the CTBTO illustrated a practical way to build an institution in a previous era — create the tools, prove they're useful, and let them accrue political weight even without legal authority — its current status reflects its fragility. It has a near-complete global



sensor network and has erected a strong taboo against nuclear testing, yet its unfinished character leaves it vulnerable to fresh political shocks.

Whether Mr. Trump's threat to restart U.S. testing will overcome decades of norm-building will be determined as much by choices in Washington, Moscow, Beijing, and other capitals as by the CTBTO's continued delivery of timely, credible data that leaves little ambiguity about any state's actions. The organisation can't compel ratification or prevent unilateral decisions but its core of transparency remains perhaps the most concrete path to eventually legally ensuring complete nuclear restraint.

TEPID RELIEF

President Donald Trump has garnered the dubious honour of presiding over the longest federal government shutdown in U.S. history, a 43-day spiral of economic uncertainty and gloom that was finally terminated this week. Plunging the lives of nearly 1.4 million furloughed and pay-denied federal employees into chaos, Mr. Trump and his Republican colleagues in Congress appeared to prevail over the hopes of Democrats to extend health insurance subsidies for low-income Americans, set to expire at the end of 2025. In return, they conceded precious little — the assurance of holding a vote in the U.S. Senate on the subsidies, but not a vote in the House of Representatives and no promised support by Republicans for the Democrats' position on the subject. However, Republican lawmakers won by 60 votes against 40 in the Senate, to end the shutdown deadlock on Sunday, only because eight Democrats broke with their party ranks to support the package to fund some federal agencies and policies for the entire fiscal year, and others until January 30, 2026. A triumphant Mr. Trump vowed to press on with his campaign to end the congressional filibuster, the practice envisioned to be a means to check hasty or ham-handed legislative action, deployed by Democrats on this occasion to fight for affordable health care for low-income families.

While breaking the logjam in Congress will come as a relief to many, it is hard to understate the impact of the shutdown on the economy, which saw the suspension of a range of public services, including flights, a setback to routine functions in sectors such as food and nutrition benefits including food stamps for the poor, early learning programmes for poorer families, and those relating to the Internal Revenue Service, national parks and social services more broadly. Yet, the sheer muscle power that Republicans enjoy through their control of both houses of Congress helped them put Democrats on the back foot on the shutdown issue, despite the latter's victory in the recent mayoral, gubernatorial and other State-level elections. However, the acid test in the swing of the power pendulum between Mr. Trump, emboldened by the margin of his win at the ballots in last year's presidential election, and resurgent Democratic lawmakers, will be next year's mid-term elections. This will serve as a de facto referendum on the Trump administration's job performance and will principally include within its purview economic policy issues impacting ordinary Americans, such as jobs, as well as questions on health care, education and immigration. Unless Republicans give some quarter to their liberal and progressive colleagues across the aisle, they face the risk of alienating a sizeable cohort of voters in the months ahead.

WHY A SOCIALIST WON IN THE WORLD'S FINANCIAL CAPITAL

Last week, Democrat Zohran Mamdani, 34, defeated Andrew Cuomo, an independent, to become New York City's youngest mayor in a century. Mr. Mamdani has promised to implement rent freezes, establish public grocery stores, expand universal childcare, introduce fare-free buses, and



increase access to affordable housing. To fund these proposals, he has suggested increasing corporate taxes and additional taxes on millionaires.

Mr. Mamdani's identity — he is Muslim and was born in Uganda to Indian parents — and policies struck a chord with the city's residents, who have traditionally favoured career politicians and wealthier candidates for the post. Previous mayors include Michael Bloomberg, who had also pledged a substantial sum in support of Mr. Cuomo. Support from several billionaires and threats from U.S. President Donald Trump to cut federal funds for the city could not stop Mr. Mamdani's welfare-state campaign. As a result, New York City, chosen as the world's top financial centre for the sixth time in 2024 by the Global Financial Centres Index, is going to be led by a democratic socialist. The reasons for this shift are clear. As the financial hub evolves, so do its workers, voters, and their preferences, which now align closely with the solutions proposed by Mr. Mamdani.

The share of people employed in finance, insurance, and related fields such as investment banking, brokerage, and portfolio management in New York has declined from over 16% to just above 13% (Table 1). In contrast, the share of those working in private education, healthcare, and social assistance — including teachers, nurses, and childcare workers, who are generally lower paid — has increased from over 30% to about 40%. Moreover, about one in four of the New York State's residents are now foreign-born.

It is no surprise that Mr. Mamdani's policies aimed at making housing, transport, and food more affordable have resonated with the city's residents, as prices in all these areas have been rising faster in New York compared with many other metropolitan areas in the U.S. In New York City, average housing expenditures rose by more than 68% between FY12 and FY22, the highest among those listed in Table 2. Average transportation costs increased by about 56% between FY13 and FY23, compared with a national average of 41.5%. Similarly, average food expenditures grew by over 56% during the same period, compared with a national average of 46.4%. New York and San Francisco are the only two metros where costs have increased by over 55% in all three areas.

Mr. Mamdani's margin of victory over Mr. Cuomo exceeded 10 percentage points in the boroughs of Brooklyn, Manhattan, and Bronx, where the proportion of residents living in poverty and the share of those relying on the Supplemental Nutrition Assistance Program are notably higher. In contrast, Mr. Cuomo led in Staten Island, where both shares are the lowest, and Mr. Mamdani's lead was much narrower in Queens, which also has relatively fewer low-income residents (Table 3).

Data published by The New York Times indicates that Mr. Mamdani's policies had a clear impact on the election outcome. According to the paper's post-election analysis, 57% of voters in precincts where most residents live in rented accommodation supported Mr. Mamdani. Similarly, about 62% of voters in precincts with a majority of public transport commuters backed him. In contrast, in precincts dominated by homeowners and car commuters, more than half voted for Mr. Cuomo.

AMORAL EMBRACE

For Ahmed al-Sharaa, the founder of al-Qaeda's Syria branch, and now the President of Syria, his recent visit to the White House has marked a remarkable turnaround in his career. From commanding an outfit responsible for suicide bombings and targeted killings, and carrying a \$10 million bounty on his head, Mr. Sharaa, who until recently was known as Abu Mohammed al-Golani, is now a very close partner of Washington. After their meeting, U.S. President Donald



Trump said that he “gets along with him”. In December, only weeks after Mr. Sharaa’s Hayat Tahrir al-Sham (HTS) toppled the secular Ba’athist regime of President Bashar al-Assad and seized Damascus, the U.S. lifted the bounty on the former jihadist commander. Earlier this week, Mr. Trump granted Syria wide exemptions on sanctions, and pressed Congress to repeal a 2019 law that imposed harsh penalties on the country, while Syria promised to join the war against the Islamic State. Mr. Sharaa has also signalled his desire to improve ties with Israel, America’s closest ally in West Asia, even as Israel grabbed more Syrian territories in the Golan region after Mr. Assad’s fall. Reports suggest the U.S. is preparing its presence at an airbase in Damascus as it brokers a Syria-Israel security pact. The message is clear: Syria, under Mr. Sharaa, seeks entry into the U.S.-led regional order, and Washington is reciprocating enthusiastically.

While allowing a country of 25 million people battered by western sanctions, foreign interventions and civil war, to join the regional economic mainstream is welcome, what troubles many is Mr. Sharaa’s not-so-distant past. He was Abu Bakr al-Baghdadi’s choice to open al-Qaeda’s Syria branch. He split with Baghdadi when the latter founded the Islamic State in the early 2010s, and remained loyal to Ayman al-Zawahiri’s al-Qaeda. Mr. Sharaa began to distance himself from al-Qaeda only after his forces captured Idlib, which became the hub of anti-Assad factions. As the ruler of Idlib, he maintained close ties with Türkiye. In November 2024, his HTS launched a rapid offensive against the Syrian army, which was badly hurt by Israeli bombings, and captured Damascus. Soon after, he was embraced by regional and western governments alike. While Mr. Sharaa has promised to build an inclusive Syria, the country has witnessed at least two massacres against minorities — against Alawites and the Druze. His attempts to centralise power through sham elections have deepened sectarian divides. Transnational jihadists within the HTS continue to operate freely. But the U.S., once vocally concerned about the human rights situation in Syria under Mr. Assad, appears to have given a free pass to Mr. Sharaa. If he is rehabilitated without accountability for his past and scrutiny of his present rule, Syria’s wounds will remain unhealed, keeping it on the brink for years to come.

TURKIYE ISSUES ARREST WARRANTS AGAINST NETANYAHU OVER GAZA ALLEGATIONS

In a significant escalation of diplomatic tensions, Türkiye has issued arrest warrants against Israeli Prime Minister Benjamin Netanyahu and 36 other senior officials, accusing them of genocide and crimes against humanity in Gaza. This development, announced on 7 November 2025, comes amid ongoing global scrutiny of Israel’s military operations in the region, nearly a year after the International Criminal Court (ICC) issued similar warrants for Netanyahu and his former defence minister.

The charges stem from what Türkiye describes as “systematic acts of genocide and crimes against humanity” in Gaza, including the bombing of the Turkish-Palestinian Friendship Hospital (built by Türkiye in the enclave) and actions against the Global Sumud Flotilla, an aid vessel seized in October. The prosecutor’s office invoked Articles 76 and 77 of the Turkish Penal Code, which address genocide and related offences. Since the suspects are not in Türkiye, the warrants effectively bar them from entering the country.

This move follows complaints filed by Turkish lawyers with the ICC and UN Human Rights Office, highlighting specific incidents like the killing of five-year-old Hind Rajab and attacks on aid efforts.



Israel's Strong Rebuttal

Israel swiftly condemned the warrants as a "PR stunt" orchestrated by President Recep Tayyip Erdogan. Foreign Minister Gideon Sa'ar remarked on social media: "In Erdoğan's Turkey, the judiciary has long since become a tool for silencing political rivals and detaining journalists, judges, and mayors." He referenced the recent arrest of Istanbul Mayor Ekrem Imamoglu, a political opponent of Erdogan. Former Foreign Minister Avigdor Liberman echoed this, arguing that the warrants underscore why Türkiye should have no role in Gaza's reconstruction or administration. Türkiye wants to take part in the international stabilisation force intended to play a role in post-war Gaza, according to Mr. Trump's plan.

The Israeli response also notes Türkiye's support for Hamas and its own historical controversies, including genocide accusations over the Armenian massacres of 1915–1923, which Israel has not formally recognised—though Netanyahu personally acknowledged them in August 2025.

Broader Reactions and Context

Hamas hailed the decision as a "bold step towards justice," while Palestinian casualties in Gaza since October 2023 stand at over 68,000 killed and 170,000 injured, according to reports. Türkiye, which joined South Africa's ICJ case against Israel last year, continues to position itself as a vocal advocate for Palestinians. However, the warrants are unlikely to have immediate legal impact outside Türkiye, given Netanyahu's existing ICC status and strained bilateral ties.

IN FREE FALL

Sudan is no stranger to violence by paramilitary forces. Yet, the rape, pillage and mass killings carried out by the Rapid Support Forces (RSF) in El-Fasher, after their capture of the city in the Darfur region in late October, were shocking even by Sudan's grim standards. The RSF, a predominantly Arab militia, known for its brutality against Sudan's African communities, unleashed a wave of atrocities, including a massacre at a maternity hospital. The RSF now controls five of Darfur's capitals, tightening its grip over the famine-stricken region. In a chilling demonstration of impunity, RSF militants posted footage of some of their crimes on social media. Born from the Arab supremacist Janjaweed militia in the early 2000s, the group had faced accusations of ethnic cleansing and genocide against non-Arab communities in Darfur. It laid siege to El-Fasher, the Sudanese army's last major stronghold in Darfur, 18 months ago, a blockade that triggered a famine in the region. More than 12 million people have been displaced since Sudan's civil war broke out in April 2023, and tens of thousands killed. According to UN experts, the country is now facing the world's worst humanitarian crisis. While both the army and the RSF have been accused of war crimes, the atrocities by the paramilitary force have increasingly been described as genocidal.

When the regime of dictator Omar al-Bashir fell in 2019, many hoped that Sudan was on the cusp of a new dawn. But hopes for a democratic transition were short lived as the military and the RSF jointly staged a coup in 2021. Mr. Bashir had raised the RSF out of the ranks of the Janjaweed and treated the group as his personal army. He used it to neutralise domestic opposition and as a parallel structure to the military. Yet, when the roots of the Bashir regime were shaken by public protests in 2019, the RSF turned against him. But once the military consolidated power in 2021 and insisted that the RSF integrate with the regular army, the alliance between the army and the RSF fell apart, plunging Sudan into civil war. Today, the military government, backed by Egypt, controls most of Sudan, while the RSF, supported by the UAE, dominates Darfur. Earlier this year,



the army pushed the RSF out of Khartoum, the capital. But the fall of El-Fasher confirms that the militia remains entrenched in its stronghold. If the fighting continues, Sudan risks more death, destruction, and even a state collapse. The atrocities in El-Fasher should serve as a wake-up call for the international community. The war must be brought to an end. For that, the backers of both the military and the militia should press for talks instead of sending more weapons into Sudan.

IRAN SEIZES TANKER IN STRAIT OF HORMUZ, US OFFICIAL SAYS, AS TENSIONS REMAIN HIGH

Iran's Revolutionary Guards reportedly intercepted the Talara, a Marshall Islands-flagged oil products tanker, and directed it towards Iranian waters on Friday, maritime security sources told news agency Reuters.

— The tanker had been carrying high-sulphur gasoil from Sharjah to Singapore and was sailing off the United Arab Emirates' coast when contact was lost, the vessel's manager, Columbia Shipmanagement, told Reuters.

— Britain's UK Maritime Trade Operations (UKMTO) agency said the incident "is believed to be state activity", reporting that the tanker was moving into Iranian territorial waters.

— A US defence official told the Associated Press (AP) that Iranian forces seized the Talara as it travelled through the Strait of Hormuz from Ajman to Singapore. The official spoke on condition of anonymity to discuss intelligence findings.

— US Navy MQ-4C Triton drone observed the incident for several hours. Private security firm Ambrey told AP that three small boats approached the tanker during the seizure.

— Around one-fifth of the world's traded oil passes through the Strait of Hormuz. The US Navy's Bahrain-based Fifth Fleet continues patrols to keep the waterway open.

Do You Know:

— The strait of Hormuz lies between Oman and Iran. It links the Gulf north of it with the Gulf of Oman to the south and the Arabian Sea beyond.

— It is 21 miles (33 km) wide at its narrowest point, with the shipping lane just two miles (three km) wide in either direction. It is a key passage through which 20–25 per cent of global oil supply transits, as well as a critical corridor for LNG shipments from Qatar and the UAE. Qatar, notably, is among the top LNG suppliers to India.

— Because of its geographic location, there is no sea route alternative to the Strait of Hormuz. So if the passage of ships through the strait were to be disrupted, it would have ramifications for oil and LNG trade worldwide, and prices would shoot up. Any fluctuation in oil prices has a trickle-down effect on the prices of many other goods and commodities.

HOW 27TH AMENDMENT CEMENTS PAKISTAN ARMY'S STRANGLEHOLD OVER POWER

Pakistan President Asif Ali Zardari on Thursday (November 13) signed the 27th Amendment to the 1973 Constitution into law; it was passed by the Senate that very day and the National Assembly a day earlier.



— The Amendment has already been widely analysed as demolishing Pakistan’s current constitutional framework. It brings sweeping changes to the country’s civil-military and inter-services setup, and its federal character.

— **Key changes include:**

- the establishment of the Chief of Defence Forces office which will always be held by the Army Chief who will effectively also command the Pakistan Navy (Article 243), and Air Force
- complete legal immunity to five-star rank officers even after demitting office (a privilege not granted to either the President or Prime Minister in Article 248)
- supersession of the Supreme Court of Pakistan (SCP) through a new Federal Constitutional Court which usurps the SCP’s power to hear constitutional matters.

— Ultimately, however, the Amendment represents three crucial aspects:

(i) the logical fulfillment of Asim Munir’s quest to make Pakistan a “hard state”

(ii) the maturity of Pakistan’s “hybrid model” of governance that has kept the military in charge while redirecting formal accountability to a civilian administration (especially since 2018)

(iii) the institutionalisation of the military’s centrality to Pakistan’s foreign policy.

— The Pakistan Army’s dominance of the country’s political and economic structures is historic and well known. However, the domestic popularity of the military within Pakistan evidently touched new lows, especially during and after the removal of former Prime Minister Imran Khan.

— However, it is also clear that the Pakistan Army under Asim Munir used two specific catalysts to set up the eventual strengthening of the military’s hold on power.

— **The first catalyst was internal.**

Parallel to the downturn in Pakistan’s democratic character, there has been a sharp rise in militant and terrorist attacks in the country, with over 2,300 attacks since early 2021. This includes the resurgence of the Tehreek-e-Taliban Pakistan (TTP), which has benefited immensely from the Afghan Taliban’s return to power in neighbouring Afghanistan.

— **The second catalyst was external.**

Provoking a bilateral crisis with India in April/May of 2025 evidently allowed the military to rally more popular support for itself. Notwithstanding the fact that the Pakistan Air Force briefly threatened to crowd the Army out of the spotlight during the crisis, Asim Munir’s rapid elevation to Field Marshal (a rank ceremonially held for life) allowed the Army to substantially refocus attention towards itself.

— The 27th Amendment to the Pakistani Constitution evidently stands in sharp contrast to the directions that Pakistan’s last Army Chief Qamar Bajwa had issued in 2022 when he asserted that the armed forces had distanced themselves from politics, “and wanted to continue to do so”.

— However, given the rich lessons that the Pakistan Army has drawn from past periods of direct military rule, it has long been evident that the military has been on a fresh learning curve that allows it to nourish the hybrid model instead of formally taking power.



- Since Pervez Musharraf demitted office, the nascent stages of this hybrid model featured at least some internal limits, given the Pakistan Army’s learning that formal military rule could potentially trigger even wider popular unrest.
- Finally, the 27th Amendment has also ensured that the judiciary (as the last pillar of a democratic state) does not undermine the military’s consolidation of power.
- The security of the Pakistan Army’s predominant domestic position through the 27th Amendment is also vital for the institution to fully leverage its role for Pakistan’s new relationships with both old and new partners.
- These include new regional security architectures, such as the Saudi-Pakistan Strategic Mutual Defense Agreement, which the Saudi state can leverage to build its own nascent indigenous defence capabilities in return for economic assistance to Islamabad.
- Here, the Pakistan military’s unique position as a significant partner to major defence manufacturers such as China and Turkey allows it to channel both military equipment and knowledge to third states such as Saudi Arabia or Azerbaijan.



DreamIAS



NATIONAL

INDIA-BHUTAN RELATIONS: CULTURAL AND STRATEGIC PARTNERSHIP

Overview of Prime Minister Modi's Bhutan Visit

Prime Minister Narendra Modi undertook a significant two-day visit to Bhutan on November 11-12 to attend the Global Peace Prayer Festival (GPPF) and hold bilateral discussions with Bhutan's leadership. This visit underscored the deepening spiritual, cultural, and developmental ties between the two Himalayan neighbours.

Cultural Diplomacy: Buddha Relics Exchange

The "Goodwill Gift"

The sacred relics of Lord Buddha, described as a "goodwill gift" from India to Bhutan during the 16-day Global Peace Prayer Festival, reached Thimphu on Saturday, ahead of Prime Minister Modi's scheduled visit. The casket containing the relics—a part of the remains of Buddha's body—will be enshrined at the Grand Kora at Tashichho Dzong, near the palace of the King of Bhutan in Thimphu, for public display from November 12 to 17.

Historical Significance

According to the Centre for Bhutan and Gross National Happiness Studies, the organisers of the GPPF, the relics are named after Piprahwa, a site in Uttar Pradesh near the Nepal border, where they were discovered. These relics hold profound historical and spiritual significance and are regarded amongst the most venerated objects in the global Buddhist tradition.

Symbolic Importance

The enshrinement of the relics commemorates the 70th birth anniversary of the fourth King of Bhutan, Jigme Singye Wangchuk, and coincides with Mr Modi's visit to Thimphu for the GPPF.

Bhutan's Prime Minister Tshering Tobgay stated that he saw the relics as a "gift from PM Modi" to the people of Bhutan, noting that "the gesture shows that the two countries are on the same page when it comes to spiritual collaboration, not just political and developmental cooperation."

Cultural Context

There is significant interest and appreciation in Bhutan because the sacred relics of Lord Buddha have reached Thimphu during the GPPF, organised by Sangye Khandu, an aide to Jigme Singye Wangchuk.

Bilateral Cooperation: India's Reaffirmed Support

India's Strategic Commitment

India on Wednesday reaffirmed its "unwavering" support to Bhutan's 13th five-year plan as Prime Minister Narendra Modi held talks with former king Jigme Singye Wangchuk and joined Bhutanese leadership to attend the Kalacakra initiation ceremony, hosted as part of the Global Peace Prayer Festival.



Key Areas of Cooperation

Following the meeting, Modi lauded Singye's contribution in further cementing India-Bhutan ties and said the discussions focussed on bilateral cooperation in areas of energy, trade, technology and connectivity.

Specific Initiatives Discussed:

- Cooperation in energy, trade, technology and connectivity
- Progress in the Gelephu Mindfulness City Project, which aligns with India's Act East Policy

Developmental Partnership

In the morning, Modi inaugurated the "Kalacakra Wheel of Time Empowerment" at the Global Peace Prayer Festival, which was attended by top Bhutanese leaders including former King Jigme Khesar Namgyel Wangchuck and Singye

- Neighbourhood First policy guides India's relations with countries in its immediate neighbourhood. It focuses on creating mutually beneficial, people-oriented, regional frameworks for stability and prosperity through the building of physical, digital and people-to-people connectivity.

K4: OLD FRIEND OF INDIA, BHUTAN'S GUIDING HAND

Prime Minister Narendra Modi is in Bhutan to attend the 70th birthday celebrations of the fourth king of Bhutan, Jigme Singye Wangchuck, the father of the incumbent king, Jigme Khesar Namgyel Wangchuck.

— Popularly known as K4, Jigme Singye Wangchuck became the king of Bhutan — 'Druk Gyalpo', or the Dragon King in Dzongkha language — in 1972 at the age of 16, when his father, King Jigme Dorji Wangchuck, passed away.

— In his tenure of over 30 years, K4 interacted with 12 Indian Prime Ministers, from Indira Gandhi to Rajiv Gandhi to Atal Bihari Vajpayee to Dr Manmohan Singh, till he abdicated the throne in 2006 for his son. He also took the bold step of converting the hereditary monarchy to a constitutional monarchy and turning Bhutan into a democracy by 2008.

— When Jigme Singye Wangchuck ascended the throne as a teenager, he did not come unprepared. His father had appointed him as the Chairman of the Planning Commission in 1971, which planned and coordinated Bhutan's five-year plans.

— These plans had been launched with the help of Prime Minister Jawaharlal Nehru in 1961, modelled on India's Five-year Plans.

— Thus, Jigme Singye's first official role not only gave him an exposure to governance, it also made him understand the Indian government's financial support and the intricacies of the discussions on hydro-power projects then underway between the two countries. He also developed a good rapport with Indira Gandhi.

— In 1974, he took the decision of pegging the Bhutanese currency to Indian rupee in consultation with Indira Gandhi. Indian officials say that he oversaw the introduction of the Ngultrum



(Bhutanese currency) and kept it pegged 1:1 to the Indian rupee, minimising foreign exchange risks and making day-to-day trade with India seamless.

— Very early, he took the call to strengthen Bhutan’s relationship with India and decided to be in constant touch with key stakeholders — important leaders of Assam, West Bengal and Odisha, and senior government officials in Delhi.

— Besides deepening ties with India, he also engaged with the world. While Bhutan became a member of the UN in 1971, under his reign, diplomatic ties were developed with Bangladesh (1973), Kuwait and Nepal (1983), Maldives (1984), Denmark, Norway, Sweden, Switzerland and Netherlands (1985), Japan and Finland (1986), South Korea and Sri Lanka (1987), Austria (1989), Thailand (1991), Bahrain (1992), Singapore and Australia (2002) and Canada in 2003.

— He also coordinated with Rajiv Gandhi as SAARC was established, and went to Dhaka in 1985 as one of the founding members. This made a big difference to Bhutan’s image.

— Under Jigme Singye, cooperation with India on hydro-power projects really took off, which has proved a success for both countries.

— Jigme Singye also helmed security cooperation with India in flushing out militants from Bhutanese soil in 2003-04, when Vajpayee was PM.

— While K4 abdicated the throne in 2006, he negotiated with Manmohan Singh on the India-Bhutan Friendship Treaty of 2007, which upgraded the 1949 India-Bhutan Treaty of Friendship to reflect modern realities.

— The 1949 treaty had said that Bhutan would be guided by India in conducting its external affairs. Bhutan’s democratic transition paved the way to replace this clause with a modern mutual-cooperation framework in the 2007 agreement.

— India and Bhutan are connected not just by borders but also by cultures, Prime Minister Narendra Modi said Tuesday as he arrived in the Himalayan nation for a two-day visit.

— Modi held talks with Bhutan king Jigme Khesar Namgyal Wangchuck. They inaugurated the 1,020 megawatt Punatsangchhu-II hydroelectric project developed jointly by India and Bhutan.

— The two sides agreed on an “understanding on the resumption of work on the main dam structure of 1,200 MW Punatsangchhu-I Hydroelectric Project”, according to a statement by the Ministry of External Affairs.

— It was decided that land would be granted in Varanasi for a Bhutanese temple/monastery and a guest house.

FISHING TROUBLES

The arrest of 14 Tamil Nadu fishermen by the Sri Lankan Navy on November 9 for allegedly crossing the International Maritime Boundary Line (IMBL) and entering Sri Lankan waters could be viewed by some as yet another event statistically. However, the incident forms part of the painful legacy of the Palk Bay dispute, which India and Sri Lanka have still not been able to resolve despite the livelihood of fishing communities on either side being at stake. So far, 128 fishermen from Tamil Nadu, including those apprehended in 2024, and their boats, remain under Sri Lankan custody, as stated in Tamil Nadu Chief Minister M.K. Stalin’s recent letter to External Affairs



Minister S. Jaishankar. This is a complex and chronic problem. As far as the fishermen of Tamil Nadu are concerned, they struggle to access traditional fishing waters, even if this means going beyond the IMBL. The duration and cost of each voyage are of not much concern to the fishermen and their employers, who own fishing vessels, as this is a rapid operation. Leaving aside the high possibility of action by Sri Lanka, the swiftness with which each voyage is carried out is what drives fishermen in the name of “tradition”. This involves bottom trawling which damages coral beds, shrimp habitats, and depletes fish stocks. The fishermen of the Northern Province, who have still to overcome the trauma of the civil war, would not have a problem even if the Tamil Nadu fishermen cross the IMBL, but follow traditional fishing methods and use small boats. What hurts them more is the use of trawlers which destroy their marine resources.

The Joint Working Group on Fisheries met in Colombo on October 29, 2024. In March this year, fishermen leaders from Rameswaram in Tamil Nadu visited Sri Lanka to hold discussion with their counterparts but there was no official sanction for the initiative of the two fishing communities. The Janatha Vimukthi Peramuna-led National People’s Power regime, which has been in office for about a year, has not yet shown any urgency in resolving the dispute, except taking a strident position. Experts have suggested a number of measures to resolve the issue. Apart from learning from the experience of the EU Baltic countries and equitable quotas to conserve the living resources, India and Sri Lanka can set up a research station in the Palk Bay region for experiments to increase living resources and safeguard the marine environment. To boost the confidence of the fishermen of the Northern Province, New Delhi should go the extra mile by launching a liberal assistance scheme to prepare them to move out of bottom trawling and take to deep sea fishing, apart from imposing a ban on the pernicious practice eventually.

CENTRE NOTIFIES RULES FOR DEEP-SEA FISHING

The Union Government on Saturday notified the rules for ‘Sustainable Harnessing of Fisheries in the Exclusive Economic Zone (EEZ)’ to give priority to fishermen cooperative societies and fish farmer producer organisations (FFPOs) for undertaking deep-sea fishing operations and managing technologically advanced vessels. “The EEZ rules will not only facilitate deep-sea fishing but will also contribute to enhancing seafood exports by emphasising value addition, traceability, and certification,” the Union Fisheries Ministry said in a release.

The rules has defined “operator” as an individual or enterprise, or FFPOs or Fisheries Cooperatives (including multi-state cooperatives), that controls the operation or management of a fishing vessel or who has assumed the responsibility for its operation.

The rules added that the Centre would take steps to provide training and capacity-building of traditional and small-scale fishers including fisheries cooperatives, Self Help Groups and FFPOs to enhance skills for deep sea fishing and value-chain efficiencies.

The Ministry said the initiative is expected to open new horizons for the country’s marine fisheries sector through the creation of modern infrastructure and the introduction of the mother-and-child vessel concept, allowing mid-sea transshipment under an effective monitoring mechanism of RBI regulations. “In island regions of the Andaman & Nicobar Islands and Lakshadweep, which together account for 49% of India’s EEZ area, the use of mother and child vessels will give boost to the export of high-quality fish,” the Ministry said.

A spokesman for the Seafood Exporters Association of India said the rules should define juvenile and illegal fishing and must ensure that a proper catch certification is provided by the Marine



Products Export Development Authority. “We need to have a proper catch certification and the country must promote sustainable fishing practices to help us get new markets,” he said.

The rules prescribe that the applications for catch certificate and health certificate shall be submitted through designated online portals of the respective agencies, which shall be duly integrated with the ‘ReALCRaft’ portal for verification and processing of vessel and catch-related information. The Centre said the EEZ Rules take a firm stand against harmful fishing practices such as LED light fishing, pair trawling and bull trawling to protect the marine ecosystem and ensure equitable fishing opportunities.

“To conserve biodiversity, a minimum legal size for fish species will also be prescribed and Fisheries Management Plans will be developed in consultation with stakeholders including State governments to restore declining fish stocks. Mariculture practices such as sea-cage farming and seaweed cultivation will also be promoted as alternate livelihoods in order to reduce fishing pressure in nearshore areas while increasing production without compromising environmental integrity,” it said.

DISCORD BETWEEN THE SUPREME COURT AND THE CENTRE OVER TRIBUNALS

The Supreme Court’s hearing of petitions challenging the Tribunals Reforms Act, 2021, saw sharp exchanges last week, bringing into focus the long-running confrontation between the judiciary and the executive over the control and administration of tribunals.

— On Thursday (November 6), a bench led by Chief Justice of India (CJI) BR Gavai expressed strong displeasure at the Centre’s request for an adjournment in the case. Calling the move “very unfair to the Court”, the CJI noted that Attorney General R Venkataramani, representing the government, had been accommodated twice before.

— The ongoing case has impacted tribunals across the country. Tribunals are quasi-judicial bodies set up to provide speedy and specialised resolution of disputes in areas ranging from taxation and corporate law to administrative matters, thereby reducing the caseload on other courts.

— In September 2021, the Madras Bar Association (MBA) challenged the constitutional validity of the Tribunals Reforms Act, calling it a direct attempt at “legislative overruling” of a Supreme Court judgment and claiming that it undermined the independence of the judiciary.

— The challenge centred on provisions of the Act that are identical to those of an earlier ordinance, which the Supreme Court had struck down in July 2021. The most contentious was fixing the term of office for tribunal members at four years and setting the minimum age for their appointment at 50 years.

— The association argued that by re-enacting the very same provisions that the court found unconstitutional, Parliament nullified a judicial verdict without removing the legal basis or “defect” pointed out by the court. This, it contended, violates the basic principles of judicial independence and separation of powers.

— The case is the latest chapter in a legislative and judicial back-and-forth that began in 2017 with the Finance Act, which empowered the Centre to frame rules for tribunals. The rules notified by the government were struck down by a Constitution bench of the Supreme Court in the Rojer Mathew case in 2019 for undermining judicial independence.



— When the Centre notified a new set of rules in 2020, they were again challenged by the MBA. In that case, the Supreme Court recommended several modifications — including a five-year tenure for tribunal members to ensure their independence. It argued that a shorter term would discourage meritorious candidates and increase executive interference.

— The petitioners, led by the MBA, argued that a four-year tenure makes members of tribunals insecure and susceptible to executive pressure, especially if they hope to be reappointed. They also contended that the 50-year age limit arbitrarily excludes successful younger lawyers from consideration, even though a person can become a High Court judge at a younger age.

— The Union government, in its counter-affidavit filed before the court, said that the age limit ensures that candidates have sufficient experience and that a four-year term, combined with the possibility of reappointment, provides adequate security.

— The standoff over appointments and service conditions has caused long delays in filling tribunals' vacancies.

— The Supreme Court itself has previously observed that the delays in appointments have left tribunals "virtually defunct".

CJI TO DEAL WITH CLAIM THAT HC JUDGE APPROACHED NCLAT MEMBER ON ORDER

The Supreme Court trained the spotlight on Chief Justice of India B.R. Gavai on Friday, saying the top judge "must have" acted on the anguish of a judicial member on the Chennai Bench of the National Company Law Appellate Tribunal (NCLAT) who chose to recuse after recording in an order that "one of the most revered members of the higher judiciary" approached him for a decision favouring one of the parties in a high-stakes case.

A Bench of Justices Surya Kant and Joymalya Bagchi said the matter was of "vital public importance" and the "law must take its course".

The NCLAT's Chennai Bench led by the judicial member in question, Justice Sharad Kumar Sharma, passed the order on August 13 in an appeal filed by A.S. Reddy, the suspended director of Hyderabad-based KLSR Infratech, which is facing corporate insolvency resolution proceedings under the Insolvency and Bankruptcy Code. Justice Sharma is a retired Uttarakhand High Court judge, who was appointed to the NCLAT.

The Supreme Court Bench was hearing a petition filed by M/s. AS Met Corp Pvt Ltd, the operational creditor of KLSR Infratech and the first respondent in the case.

'Interference by judge'

"The judicial member has preserved the WhatsApp message he received and the number. The message came from the Chief Justice of a High Court... That is why the judicial member recused," advocate Prashant Bhushan, representing M/s. AS Met Corp Pvt Ltd, alleged.

"We believe the competent authority [Chief Justice of India] must have examined the available material and taken necessary steps as required. All these issues will be effectively dealt with by the Chief Justice of India on the administrative side," the Bench headed by Justice Kant observed. Justice Kant is taking over as Chief Justice of India after the retirement of Justice Gavai on November 24.



The court, passing orders on the judicial side, transferred the case from Chennai to the Principal Bench of the NCLAT based in New Delhi.

WHO KILLED THE VICTIMS AT NITHARI? 19 YEARS LATER, SURENDRA KOLI'S ACQUITTAL INDICTS CRIMINAL JUSTICE SYSTEM

In 2006, the discovery of human remains in a drain behind a bungalow in Noida's Nithari village exposed a horrific series of crimes — there were at least 16 missing children and young women, and many broken families. The police named two men: Businessman Moninder Singh Pandher, and his domestic help, Surendra Koli, with the latter accused of being the main perpetrator. Both were convicted and sentenced to death by the lower court in one of India's most sensational cases. Nineteen years later, and two years after the Allahabad High Court acquitted Pandher citing lack of evidence, the Supreme Court's acquittal of Koli has again upended the narrative. What was once portrayed as conclusive justice for a "rarest of rare" case now stands as an instance of "manifest miscarriage of justice", aided and abetted by procedural collapse. On Wednesday, Koli walked out of Kasna jail nearly two decades after his arrest. The verdict exposes a criminal justice machinery that mistakes speed and spectacle for due process.

The apex court's judgment rests on the prosecution's failure to prove guilt beyond reasonable doubt — a collapse built on shoddy investigation amid public frenzy. Koli was in prolonged custody without counsel and there were allegations of torture, inconsistent recovery records, and lack of forensic evidence. The similarities with the 2008 Aarushi Talwar-Hemraj murders point to a dismal pattern — where haste supplants diligence, media glare overshadows method, and police, under pressure and prejudice, chase narratives rather than evidence. In Nithari, for an entire year before the crimes were uncovered, families, mostly from low-income backgrounds, had pleaded for help to trace their missing children, only to be dismissed by an indifferent force.

Who, then, killed the victims in Nithari? For their families, Koli's acquittal forces them to confront the fact that the truth may never be known. Unless the police are trained to privilege rigour over bias, evidence over assumption, unless accountability is woven into the system, there will continue to be such capitulations to the performative demands of media trials, eroding trust in the processes of justice.

GREATER OPENNESS

In September, a Supreme Court-constituted Special Investigation Team (SIT) reported to the Court that Reliance Foundation's Vantara project in Jamnagar, Gujarat — India's largest private zoo — had been above board in the manner in which it had gone about acquiring wild animals from abroad; it had the right permits and the facilities for the upkeep of over 30,000 animals and that any criticism or aspersion of its activities on these grounds were wholly "unjustified". The Court chose not to make the report public and only appended a summary in its order with the operative observations. What the report contained in its entirety becomes relevant given that a global body has made some concerning observations and "recommended" that India's wildlife authorities pause the issue of permits that allow endangered animals to be imported by zoos. This came after the CITES committee — the most influential agreement on cross-border wildlife movement — visited Jamnagar. The visit was just after the SIT had submitted its report to the Court and from what is known from its exhaustive, public report, investigated the same issues as the SIT: permits, acquisition of animals, the facilities in Jamnagar. The CITES committee too commended Vantara's



infrastructure and the expertise available for animal care. Its observations on the issue of permits casts aspersions on India's wildlife management system, not on Vantara.

The committee's reservations stemmed from observations that permit codes accompanying several animal transfers did not always accurately reflect the arrangement between the exporting country and India. For instance, the Czech Republic says that it had "sold" several animals to the procuring arms of Vantara, which denies it was a sale and that the costs incurred were ancillary (insurance and transport). The distinction is important because Indian laws do not allow its zoos to commercially procure animals. The primary objective of CITES, an international convention, is to curb animal trafficking and while lacking enforcement powers, expects countries to execute and incorporate checks into their wildlife laws. CITES does not discourage cross-border commercial transactions and only insists that these are properly recorded, with proper traceability of the animals being moved. In several instances, the committee has observed that India's authorities ought to be more proactive in engaging with counterparts in other countries to investigate suspect traceability. It is a matter of conjecture whether the Court-appointed committee also had similar observations to make. Translucent disclosure only reduces global trust in India's wildlife management and as home to some of the most important biospheres, that is a reputation it can ill afford.

DECLARE SARANDA FORESTS AS WILDLIFE SANCTUARY: SC

The Supreme Court on Thursday directed the Jharkhand government to declare the Saranda forests as a wildlife sanctuary and conservation reserve, prohibiting any mining activity within a one-km radius of its boundary.

— A bench of CJI B R Gavai and Justice Vinod Chandran allowed Jharkhand to exempt six of the compartments from the notification under the Management Plan for sustainable Mining (MPSM) in this area.

— "We direct that the state government shall notify the area comprising 126 compartments as notified in 1968 notification, excluding six compartments...as a wildlife sanctuary within three months from the date of this judgment," the bench ruled.

— Overruling the state's plan to declare only a part of the forest as sanctuary, the bench said, "... in view of the mandate of Articles 48A and 51A(g) of the Constitution, Section 26A of the Wildlife Protection Act, and particularly in the light of the report of the Wildlife Institute of India, the State cannot run away from its duty to declare the extent of 31,468.25 hectares as Saranda Wildlife Sanctuary."

— The bench directed the state "to give wide publicity to the fact that by this judgment, neither the individual rights nor the community rights of the tribals and the forest dwellers in the said area would be adversely affected".

— The top court reiterated its direction in the 2023 Goa Foundation case that "mining within the National Park and Wildlife Sanctuary, and within an area of 1 km from the boundary of such National Park and Wildlife Sanctuary shall not be permissible."

— The SC said that "National Wildlife Action Plan 2017-31 recognises the need to enhance the protected area network (broadly including national parks, wildlife sanctuaries, community reserves etc.) and to demarcate boundaries for protected areas".

**Do You Know:**

— Saranda, meaning seven hundred hills, forest division in West Singhbhum district covers about 856 sq km, and 816 sq km is a reserved forest, and the rest is a protected forest. In its assessment of the biological and ecological significance of the Saranda landscape, the Wildlife Institute of India has underlined that the area is historically recognised for its rich biodiversity.

— It presently harbours elephants, four-horned antelope, and sloth bear, and is experiencing habitat degradation and fragmentation and is home to three elephant corridors, providing connectivity with other neighbouring forests.

— A reserve forest is given the highest level of protection under the Indian Forest Act, 1927, in which hunting, grazing, and logging are prohibited except when expressly permitted. Reserve forests are designated by state governments and are key to conserving and preserving habitats and wildlife.

SC JUDGE: IMPORTED IDEAS MAY NOT SAVE ENDANGERED SPECIES

Supreme Court judge Justice P.S. Narasimha on Tuesday said many environmental law principles imported from the West such as “inter-generational equity” are anthropocentric and would hardly be of any assistance in protecting an endangered species from extinction.

Justice Narasimha made these oral observations while hearing a petition filed by M.K. Ranjitsinh on the conservation of the dying species of the Great Indian Bustard, which is being bred in captivity, and the Lesser Florican.

Senior advocate Shyam Divan, appearing for the petitioner, said there were 70 bustards in captivity and 150 in the wild. Lesser Floricans number 70.

“That is all... Captive breeding may be successful with the Great Indian Bustard, but it is not showing success with the Lesser Florican. Extinction is not an option for these two species,” he said.

‘Biblical roots’

Justice Narasimha said principles such as inter-generational equity had “Biblical” roots, with humans at the top.

The judge referred to how, 13 years ago, an amicus curiae in the red sanders conservation case, had urged the Supreme Court to consider the “intrinsic worth” of an endangered species rather than its “instrumental value to human beings”.

He criticised principles such as inter-generational equity which “pre-supposes the higher needs of human beings and lays down that exploitation of natural resources must be equitably distributed between the present and future generation”. The judge said the court, in its judgment in the red sanders case, had accepted his submissions on the need to take an ecocentric approach, which “obliges every citizen to have compassion for all living creatures”, in biodiversity law.



ON STRAY DOGS ISSUE, SC UNDERMINES ITS OWN BALANCED APPROACH

Nearly three months after recalibrating its August 11 order on the removal of stray dogs to designated shelters and allowing the animals to be returned to their original locations after being sterilised and vaccinated (unless found to be aggressive or infected with rabies), the Supreme Court last week appeared to once again harden its position on the issue. Noting that dog bites continue to be reported “with alarming frequency”, the Court ordered that stray dogs be removed “forthwith” from the premises of educational institutions, hospitals, sports complexes, bus stands and railway stations and kept in shelters after being sterilised and vaccinated. This abrupt reversal, especially on the question of releasing stray dogs back into the areas from where they were picked up, breaks from the balanced approach of the August 22 order and threatens to reignite passions on a deeply polarising issue.

Certainly, the menace posed by stray dogs, especially to children, the elderly and working class population, cannot be dismissed. According to government records, 37 lakh dog bite cases were recorded across the country in 2024. At the same time, it must be recognised that lakhs of stray dogs cannot be removed from their present homes simply by decree — and certainly not within eight weeks as directed by the Court in the latest order. The SC is right when it points out that “administrative apathy” and “systemic failure” lie at the heart of India’s stray dog problem. But housing such a large number of dogs in “designated shelters”, besides stray cattle and other animals, as ordered by the Court, also calls for funds and infrastructure at a scale that most local bodies in the country simply do not possess at present.

A complex web of causes has led to the explosion in the stray dog population, including regular feeding and care by animal lovers, unmanaged solid waste and irresponsible pet owners who allow their dogs to interbreed with “streeties”. These must be factored in for any solution to be effective — as must the need for a considered debate that does not pit the claims of public health against a more scientific and humane approach.

HOW SHOULD LAW SCHOOLS CHANGE ATTENDANCE NORMS?

The story so far:

The Delhi High Court’s judgment in *In Re: Suicide Committed by Sushant Rohilla, 2025* examines how universities should exercise disciplinary authority within the constitutional framework of fairness and reason. The case arose from the 2016 suicide of a law student barred from writing exams due to attendance shortage. The Court converted the incident into a public-interest inquiry on whether attendance policies align with fairness and proportionality. Delivered amid growing concern for student welfare, the judgment underscores that academic autonomy must operate within constitutional discipline.

What was the core issue before HC?

The Court clarified that the case was not concerned with attendance per se but its enforcement. Many universities debarred students once attendance fell below the limit, without warning, counselling or discussion. Such mechanical application violated procedural fairness and constitutional standards.

The judgment draws from Article 14’s doctrine of non-arbitrariness and procedural fairness. Universities exercising disciplinary powers are public authorities subject to constitutional



accountability; their decisions must be reasoned, proportionate and just. Fairness here is not merely procedural but a constitutional value linked to Article 21's protection of dignity and mental well-being. It safeguards due process and students' welfare as part of the constitutional promise of life with dignity.

Did HC invalidate attendance rules?

The Court upheld attendance norms but objected to rigid enforcement. It affirmed the Bar Council of India's (BCI) authority under Rule 12 of the Legal Education Rules 2008 to require 70% attendance, relaxable to 65% in exceptional cases, but called the framework "extremely strict" and urged reconsideration in light of the National Education Policy (NEP), 2020 and UGC Regulations, 2003, both stressing flexibility and learner-centred education. Attendance, when enforced mechanically, can become an exclusionary barrier. The rule remained valid, but its uncompromising application was held disproportionate. The Court viewed debarment as an extreme step with grave academic consequences.

What must universities now follow?

Post-judgment, certain procedural steps must be observed before any denial of examination on attendance grounds such as weekly attendance updates through portals or notice boards and monthly shortage notices to students and guardians for early intervention; counselling, and opportunities to address shortfalls through extra classes, home assignments or recognised academic activities such as legal-aid work; recording medical or mental-health issues or hardship; and notice and opportunity for representation. Fairness requires prior notice and a real chance to respond before any final decision. If, despite these remedial efforts, a student still fails to meet the required attendance, they may be debarred.

What are the implications?

The implications are institutional, cultural and pedagogical. Universities must foster supportive environments, integrate counselling and establish Grievance Redressal Committees with student representation. Debarment can no longer be informal or automatic, they must be reasoned and open to representation. Experiential learning through moots, internships, research or legal-aid work must count toward engagement. Attendance should encourage participation, not policing. Moreover, the BCI must revisit Rule 12 in light of NEP 2020. No law school may impose stricter norms than those prescribed.

CAN LAWYERS BREAK CLIENT CONFIDENTIALITY?

The story so far:

On October 31, the Supreme Court affirmed the indispensable role of advocates in a constitutional democracy. A Bench comprising Chief Justice of India (CJI) B. R. Gavai, and Justices K. Vinod Chandran and N. V. Anjaria ruled that a lawyer cannot be summoned merely to disclose what a client has communicated, except where legal advice is used to commit or conceal a crime. The suo motu proceedings arose from a notice issued to an advocate by the Assistant Commissioner of Police, Ahmedabad, under Section 179 of the Bharatiya Nagarik Suraksha Sanhita, 2023 (BNSS), demanding his appearance "to know true details of the facts and circumstances" in a criminal case in which he was a defence counsel.



What are privileged communications?

Privileged communications refer to confidential exchanges between certain protected relationships, such as attorney-client and spousal, that the law shields from being disclosed or compelled as evidence in court. The underlying principle is to promote honesty and trust, thereby reinforcing justice and ethical responsibility. The Bharatiya Sakshya Adhiniyam (BSA), 2023, outlines these protections in Sections 128 to 134.

Notably, Section 128 protects 'marital communications', preventing either spouse from being compelled, or even permitted, to disclose any communication made 'during' marriage, even after its dissolution, without the consent of the person who made it, except in cases where one is prosecuted for a crime against the other or in suits between them. Likewise, Section 129 bars the release of unpublished official records relating to affairs of State without departmental approval in order to safeguard national interest. Further, the advocate-client privilege under Section 132 prohibits advocates from revealing professional communications.

What did the SC state?

The top court's judgment is a concrete assertion that when the State intrudes into the lawyer-client relationship, it endangers the citizen's right to equitable representation and the justice system's structural integrity of a fair trial and rule of law. Section 132 of the BSA prohibits an advocate from disclosing any communication made to him in the course of professional engagement, even after employment has ceased, except in three circumstances: (1) if the client consents to it; (2) the communication pertains to illegal purposes; (3) the advocate observes criminal activity being carried out during the employment. Although, the privilege belongs to the client, an accused or litigant, its enforcement depends on the lawyer's silence. This silence has long shielded not just the powerful but also those with no power such as women reporting sexual violence, accident victims negotiating hostile insurers, and the families of those lost to custodial excesses. In a justice system where about 3.9 lakh citizens are undertrials, this privilege is what keeps the promise of a fair defence alive.

It's to safeguard this evidentiary privilege that the top court decided that an investigating/prosecuting agency or the police cannot directly summon a lawyer merely for appearing or advising in a case, unless there exists material showing that the summons falls within the exceptions of Section 132.

Moreover, by linking Section 132's protection to Article 20(3)'s guarantee against self-incrimination, the judgment constitutionalises the privilege, which is a key element of a lawyer's function. If a citizen cannot be compelled to confess, the State cannot achieve the same end indirectly by coercing the citizen's lawyer to disclose confidential communication.

What about a lawyer's role?

Through the verdict, the SC positions the advocate not as a private agent but as a 'constitutional actor', essential to the survival of the constitutional architecture of legal representation. This distinction matters because professional privilege is neither a perk for lawyers nor a shield that places them above the law. It is a safeguard for citizens. The SC makes that explicit: the privilege "ensures that no prejudice is caused to the accused whom the lawyer represents." When the State summons a lawyer to divulge information about his client, it converts the advocate into an involuntary witness — collapsing the distance between defence and prosecution. The verdict rightly calls such acts a "blatant breach of the rule against non-disclosure," one that undermines



both Article 21's guarantee of a fair defence and the constitutional promise of equality before law under Article 14.

Why is the verdict important?

This ruling indirectly strengthens the right to effective legal representation, a right the SC has long read into Article 21 and Article 22(1). The SC cited M.H. Hoskot versus State of Maharashtra (1978) and Hussainara Khatoon versus State of Bihar (1980), reminding that liberty without counsel is liberty in theory. At a time when investigating agencies routinely summon journalists, tax consultants, and even lawyers to "assist" investigations, the judgment restores institutional sobriety. It reminds the executive that investigative power is not unbounded. Section 179 of the BNS empowers the police to summon witnesses, but that power stops at the lawyer's door when 'professional confidence' is at stake.

CAN T.N.'S REFORMS CHANGE TRANSGENDER HEALTHCARE?

The story so far:

"Leave no one behind," a core principle of the United Nations Sustainable Development Goals and Universal Health Coverage, urges governments to prioritise healthcare for the most marginalised. Yet, transgender persons continue to face significant barriers to affordable, quality healthcare. Tamil Nadu has emerged as a pioneer in addressing these inequities through inclusive public health policies and welfare schemes that recognise the intersection of health, dignity, and social rights.

Why do transgender persons face healthcare barriers?

Transgender persons encounter multiple, overlapping barriers. First, few healthcare providers are trained in transgender health, and they are often restricted to managing sexually transmitted infections or gender-affirming surgeries, neglecting the comprehensive, lifelong health needs. Second, systemic exclusion from education, housing, employment, and social security leaves many without stable income or insurance. Third, stigma and discrimination in health settings, along with poor awareness among both providers and the public, create hostile healthcare environments that erode trust in the health system. As a result, many transgender persons either delay or avoid seeking medical attention altogether.

What has Tamil Nadu done?

Tamil Nadu stands as a pioneer in transgender-inclusive healthcare. Since 2008, the Rajiv Gandhi Government General Hospital in Chennai has offered gender-affirming surgeries, supported by India's first Transgender Welfare Board. This began many years before the 2019 Transgender Persons (Protection of Rights) Act mandated such services in at least one government hospital per State. Acting on sustained demands from the community, the National Health Mission (Tamil Nadu) established Gender Guidance Clinics (GGCs) in 2018 to provide multidisciplinary care under one roof. By 2025, eight districts in the State host GGCs, offering free gender-affirming procedures. Between April 2019 and March 2024, 7,644 transgender individuals accessed these clinics.

Tamil Nadu has made significant strides in expanding insurance coverage for transgender persons by integrating gender-affirming surgeries and hormonal therapy into the Chief Minister's Comprehensive Health Insurance Scheme (CMCHIS-PMJAY), removing income and



documentation barriers to enrolment. Over 5,200 transgender individuals have benefited from the scheme, with more than 600 receiving medical procedures. The State's approach is considered more advanced than national schemes, such as PMJAY-Ayushman Bharat TG Plus.

Legal and policy reforms, including the 2019 Transgender Act and progressive court rulings, have strengthened this inclusive model by mandating comprehensive healthcare, training providers, and affirming rights in areas such as marriage and education. However, challenges remain, such as expanding clinics, improving provider competence and accountability, regulating hospitals, and combating societal bias.

Continued commitment and engagement with transgender communities are essential to ensure lasting equity and transform Tamil Nadu's pioneering healthcare initiatives into a sustainable, inclusive model.

BURDEN OF PROOF

The Leader of Opposition in the Lok Sabha, Rahul Gandhi, has made serious accusations regarding the 2024 Haryana Assembly election, turning the spotlight, yet again, on election integrity in the world's largest democracy. At the very least, his analysis has proved that India's electoral rolls are in a mess, which the Election Commission of India (ECI) says can be fixed only by an ongoing Special Intensive Revision (SIR). Mr. Gandhi, who evidently had a professional team of analysts working on it, made a claim that 25 lakh votes in Haryana were "fake" — i.e., either non-existent or duplicate — or one in every eight voters in Haryana, where the Congress had lost the 2024 election. As per Mr. Gandhi's calculations, there were 5.21 lakh duplicate voters and 93,174 invalid voters in the State, and he claimed there were 1,24,177 voters with blurred or fake photographs on the electoral rolls. To prove this point, among other facts, he cited the example of a woman — a Brazilian model whose picture was available online — whose photograph appeared 22 times across different booths in Haryana. Earlier allegations of election manipulation included bulk deletion and addition of voters, which the Congress leader has said boosted the prospects of the Bharatiya Janata Party (BJP) and undermined the Opposition. In this, the ECI is accused of colluding with the BJP.

In its defence, the ECI has marshalled some technical arguments, but they do not clear the air, regardless of the merit of the Congress charges. The argument that complaints regarding electoral rolls should have been raised within stipulated timelines and that other complaints should have been litigated through election petitions may sound procedurally sound. But such a position does not mitigate the severe trust deficit that the ECI is facing. The Congress's charges are by themselves no conclusive proof of fraud, though they certainly demonstrate systemic failure. The ECI's defensive response and its overall tendency to raise veils of opaqueness in the electoral process add credence to the Congress's charges in public perception. The best way to prove that the people who seemingly appear multiple times on the list did not actually vote multiple times is to air the recording which is made at each booth. On the disingenuous ground of voter privacy and secrecy, the ECI has restricted access to the video footage, electoral rolls and other details of the electoral process in the recent past. The only thing secret about voting should be the vote itself. Who the voters are, and who actually voted, must be open public records. The best way to allay fears regarding the electoral process is to make all information publicly available, retaining secrecy only with regard to the choice of the voter.



DOUBLE ENGINE

The spectacular electoral victory of the National Democratic Alliance (NDA) in Bihar is one built on clever welfarism, astute social engineering, meticulous propaganda and the sustained popularity of Chief Minister Nitish Kumar and Prime Minister Narendra Modi in the State. The Opposition Mahagatbandhan of the Rashtriya Janata Dal (RJD), the Congress and other outfits suffered from the adverse popular memory of their reign, which ended 20 years ago. The NDA nurtured women as a horizontal voting bloc, even brazenly starting a new cash dole scheme on the eve of the election. Its caste alliance covered a larger spectrum, compared to the Mahagatbandhan, which, despite its best efforts, could not overcome the perception of being a narrow platform for Yadavs and Muslims. Mr. Kumar, who entered the campaign as a fading patriarch, turned around his fortunes, reinforced his centrality in Bihar politics, and became the fulcrum of the NDA victory. The BJP is ahead of the Janata Dal (United) in terms of vote and seat shares, but its route to Bihar's heart is still through Mr. Kumar. The NDA seems to have benefitted from a considerable increase in female voter turnout and from welfare schemes focused on women and Economically Backward Class (EBC) households through cash transfers and self-employment subsidies. Despite being in power since 2005, with only a short break, Mr. Kumar not only deflected anti-incumbency but also enhanced his standing. This worked in combination with the image of Mr. Modi, whose Hindutva-development claims have many takers in Bihar.

The Congress-RJD coalition failed to function as an organic platform, and its lack of cohesion and sense of purpose were all too evident. Its campaign was splintered, with its attention shifting between social justice and welfare slogans and a questioning of the integrity of the electoral process itself. India's electoral process requires serious refurbishment, but does not seem to have much traction as an election issue. Also missing among the opponents of the BJP is an appreciation of the hegemony of Hindutva in the Hindi belt. There are many questions regarding the impartiality of the electoral process, but the conclusion that the BJP and its allies are winning only because of a compromised process is a misplaced one. While the NDA could mitigate the pitfalls of anti-incumbency, the Mahagatbandhan ended up holding the can for the misdeeds and misgovernance of a previous generation of its leaders. That is a sobering message for the Congress and all parties opposed to the BJP. They need to get their house in order, craft an inspiring message, and face up to the popularity of the BJP's Hindutva politics while framing their opposition to it.

WHAT DO FORENSIC EXPERTS DO AFTER BLASTS?

The story so far:

On November 10, New Delhi witnessed a massive explosion near the Red Fort complex. An i20 car parked at the signal of the complex exploded, destroying several nearby cars, buses, and the people inside them. As of now, 13 people have been confirmed dead.

What do forensic experts do?

Experts of the Explosives Department of the Delhi Forensic Laboratory visited the scene within half an hour along with police personnel. The primary job of forensic experts in such situations is to observe and analyse the cause from a scientific perspective. They collect necessary samples and arrange for quick laboratory tests so that the cause of the accident can be found, or the identities of the people involved in the crime can be verified in a science-based manner.



It is worth noting that various media houses often report that forensic members collect samples from the site, which is partly accurate; the site does provide a wealth of information for any skilled forensic expert. However, an explosion is different from other crimes; here everything is shattered in an instant. Explosions generate intense pressure and heat, causing everything at the scene to burn to ashes, thereby complicating the work of experts. Despite the challenges, they persist in their efforts. Locard's principle states that a criminal will leave something at the scene and bring something when he arrives; both are equally important as evidence in forensics. Thus, there must be a sample linking the suspect to the scene, from which it could be possible to guess the intensity of the explosion, the source, and what kind of explosives were used.

Photographers are also present and take pictures of the site from different angles, and experts make a sketch of it, which serve as a guideline for various stages of analysis. Along with this, various burnt pieces (which experts call debris), broken parts of the car, carbon powder, etc. are collected from the scene. These samples are then analysed by explosives experts in the laboratory using spectroscopic and chromatographic techniques to determine the type of chemicals used.

During the on-site inspection, it is necessary to figure out if any piece of electronic gadget has been found, because in remote-controlled explosions, an auto-timer, the best activation technique, is usually used. However, no timer or electronic circuit has been found in the Delhi incident.

What kind of tests are done?

After gathering and analysing the initial data, experts then try to reconstruct the crime scene to better understand the explosion's timing. For this, experts use Fourier Transform Infrared Spectroscopy (FTIR) and Attenuated Total Reflectance-FTIR (ATR-FTIR). In these tests, forensic experts analyse the spectrum of the absorbed light to find out how the collected samples interact with infrared light.

The chemical composition of explosives is detected using field-specific Raman spectroscopy. Advanced Scanning Electron Microscopy (SEM) is used to analyse the morphology of the fragments found after the explosion, while Energy Dispersive X-ray (EDX) techniques are used for fundamental analysis of the residues. Scientists also use thermal analysis to determine information about explosives, such as chemical activity and stability.

Additionally, fire is an important factor in any explosion — how it spreads, how far it spreads, and the total loss caused by fire all depend on statistical data. That's why experts use laser-based scene mapping, flashpoint testing, etc. to try to determine the source of the fire and the presence of any combustible material that caused it to spread so much. Therein they decide whether it was an accident or an intentional explosion.

Are only explosives experts involved?

In the current incident, the role of the vehicle is crucial. Therefore, CCTV footage of the car needs to be thoroughly examined to find out whether anyone got in or got down in order to form an idea about the attacker. A cyber-forensic expert is necessary to achieve this.

Again, experience says that in any accident, especially in the case of organised heinous crimes like explosions, the engine number and the chassis (the metal frame of a vehicle onto which the other parts fit) number of the cars are changed before they are used for the crime purpose, so it is necessary to find out the actual engine number and chassis number of the car with the help of 'thermochemical examination,' which is popularly known as etching. Typically, the investigating



agency employs a forensic physicist for this. Moreover, DNA analysis of the body parts found at the crime scene is a must, as their families are waiting.

Therefore, in the event of an explosion, multiple divisions of a forensic science laboratory must collaborate to assist investigators in solving the crime and to ensure that the scientific analysis of various evidence is presented before a court of law.

FEATURES OF RICIN TOXIN, AT THE CENTRE OF ALLEGED TERROR PLOT

Earlier this week, the Gujarat Anti-Terrorist Squad arrested three men — including a doctor with a “Chinese medical degree” – for allegedly trying to produce a lethal chemical compound called Ricin.

— The accused were allegedly planning a terror attack, for which they had surveyed the Rashtriya Swayamsevak Sangh office in Lucknow, the Agriculture Produce Market Committee in Azadpur, Delhi and the fruit market in Naroda, Ahmedabad.

— The ease of producing the poison — coupled with very low doses needed to kill — makes it a challenge for law enforcement.

— Ricin is essentially a protein that can be extracted from the castor bean, largely grown industrially for the production of castor oil in countries such as India, Brazil, and China. The seeds typically contain 30 per cent to 60 per cent castor oil, with ricin accounting for 1 per cent to 5 per cent of the weight of the solid residue.

— Once the poison has been absorbed, it attaches itself to the ribosomes – tiny structures found in cells that are responsible for reading genetic code and synthesising proteins.

— “Once the poison binds with the ribosome, it stops protein synthesis in cells. And, depending on which cells absorb the poison, a person can suffer multi-organ failure and even death,” he said.

— While exposure to ricin is most likely to be a deliberate act, sometimes children may consume the seeds.

— Ingesting ricin can lead to severe vomiting and diarrhoea — which can become bloody – and low blood pressure. It could also lead to hallucinations and seizures, multi-organ failure, and death.

— If injected, it can cause several organ systems to stop working. If inhaled, people may experience difficulty breathing, cough, and tightness in the chest.

— One of the challenges with ricin poisoning is that it’s rare, so doctors don’t usually suspect it when a patient first arrives.

— Because of its high toxicity and ready availability, ricin has been a subject of military interest.

— It was studied as a chemical agent towards the end of World War I by the United States, but experts encountered problems related to keeping it stable at different temperatures and aerosolising – the process of converting a substance into a fine mist or aerosol that can be suspended in the air.



— Limited weaponisation was achieved during World War II. The next attempt at weaponising was made in 1980, when, according to a paper by the Organisation for the Prohibition of Chemical Weapons, Iraq attempted to develop it as an inhalable aerosol.

— Ricin is listed as a Schedule 1 toxin under the Chemical Weapons Convention — substances that pose the highest risk of being used as a chemical weapon. This list includes nerve agents such as sarin gas and blister agents such as mustard gas.

— The most widely known criminal use of the compound was to kill dissident Bulgarian journalist Gorgi Markov in London in 1978.

Do You Know:

— The CWC aims to eliminate an entire category of weapons of mass destruction by prohibiting the development, production, acquisition, stockpiling, retention, transfer or use of chemical weapons by States Parties.

MP: ROW AS MID-DAY MEAL SERVED ON SHEETS OF PAPER

A video showing schoolchildren being served midday meals (MDM) on paper sheets at the Middle School in Madhya Pradesh's Hullpur village, which emerged earlier this week, has led to red faces, administrative action, and a sharp attack from Congress's Rahul Gandhi.

— After taking cognisance of the incident, the Block Education Officer of Vijaypur inspected the school on November 6 and submitted a report detailing the circumstances that led to the lapse. — The report stated that both the Primary and Middle Schools in Hullpur operate on the same campus, and the responsibility for preparing and serving midday meals lies with the Jai Santoshi Maa Self Help Group (SHG).

— The SHG employs five cooks – three for cooking and two for cleaning utensils. On the day of the incident, both cleaners were absent, resulting in unwashed utensils. In their absence, the school staff reportedly resorted to serving food on sheets of paper, a video of which went viral on November 4.

— In light of the incident, the education department has moved to strengthen its monitoring mechanism. Cluster Academic Coordinators have been instructed to conduct monthly inspections of the midday meal programme with greater rigour, and detailed guidelines have been reissued.

— To improve transparency and accountability, all district and block-level officers will now be required to inspect at least five schools randomly each month.

— A Google Form-based monitoring system has been introduced to record inspection findings in real-time. Sub-Divisional Magistrates will review these reports weekly at the block level, while the Chief Executive Officer of the Zila Panchayat will oversee reviews at the district level.

Do You Know:

— The current version of the programme, renamed PM Poshan Shakti Nirman or PM Poshan in 2021, traces its roots to 1995; it was launched as a centrally sponsored scheme on August 15 that year across 2,408 blocks for students up to Class 5. In 2007, the UPA government expanded it to Class 8.



— However, the first initiative to provide meals to children had been taken by the erstwhile Madras Municipal Corporation around 1920. In post-Independence India, Tamil Nadu was again the pioneer, with Chief Minister K Kamaraj rolling out a school feeding scheme in 1956.

— It is not just a scheme, but a legal entitlement of all school-going children in primary and upper primary classes, through the National Food Security Act (NFSA), 2013, as well as the Supreme Court's ruling in People's Union of Civil Liberties vs Union of India and Others (2001).

— The menu varies from one state or Union Territory to another. But the authorities need to ensure that the nutritional component of the meal made up of rice, pulses, vegetables, oil and fat provide at least 450 calories and 12 gm protein to children in primary grades.

— For upper primary children, the requirements are 700 calories and 20 gm protein. The variations are in the cases of additional items such as milk, eggs, chikki, or fruits that the states provide as supplementary nutrition, the expenses for which are borne by the state government.

CENTRE NOTIFIES DATA PROTECTION RULES, PAVES WAY FOR INDIA'S FIRST PRIVACY LAW

The Ministry of Electronics and IT (MeitY) Friday notified the long awaited data protection rules, paving the way for India to have a functional privacy law, eight years after the Supreme Court ruled it as a fundamental right. The notification of the rules comes over two years after the Digital Personal Data Protection Act (DPDP Act) received the President's assent in August 2023.

— While the law is now operational, only parts of it are currently in force, as some of the most important protections available to citizens under the law will take longer — between 12 to 18 months — to be implemented.

— For instance, the requirement for entities to seek informed consent from users before processing their personal data, using their personal data only for specified legitimate uses, and for entities to notify data breaches to users, will all only be operationalised after 18 months.

— Effectively, the Data Protection Board of India (DPB), which will act as the key adjudicatory body to ensure entities comply with the law, has been implemented, along with a controversial provision which amends the Right to Information (RTI) Act to disallow disclosure of personal information about public officials even when it is justified in larger public interest.

— The government has separately notified that the DPB will have four members, and that its head office will be based in New Delhi. It had issued a draft of the data protection rules in January this year.

— The DPDP Rules, 2025, say that the Centre will specify the kind of personal data which can be processed by "significant data fiduciaries" subject to the restriction that such personal data and traffic data related to its flow is not transferred outside the territory of India.

— A committee, to be formed by the government, will determine it. This is effectively a data localisation requirement, which the industry has previously resisted. Big tech companies are expected to push back on this provision.

— A significant data fiduciary will be determined on the basis of the volume and sensitivity of personal data they process, and the risks they might have on sovereignty and integrity of India, electoral democracy, security, and public order.



- Tech majors including Meta, Google, Apple, Microsoft, and Amazon are expected to be classified as significant data fiduciaries.
- Under the rules, tech companies are required to implement a mechanism for collecting “verifiable” parental consent before processing personal data of children.
- Effectively, the government has refrained from proposing a mechanism from its side, and has left it to the companies to adopt a system of their choice, after social media companies complained that it could be a difficult provision to implement.
- In the event of a data breach, data fiduciaries will have to intimate impacted individuals “without delay” a description of the breach, including its nature, extent and the timing and location of its occurrence; the consequences relevant to the impacted user, that are likely to arise from the breach; and the measures implemented and being implemented to mitigate risk among other things.
- The penalty for failing to have adequate safeguards for preventing a data breach could go as high as Rs 250 crore.
- The Data Protection Act had come under scrutiny for granting wide-ranging exemptions to the government or its agencies while processing citizens’ personal data on grounds of ‘national security’, ‘friendly relations with other states’, and ‘public order’, among other things.
- Under the rules, a data fiduciary — an entity (either private or public) that collects and processes users’ data — will also have to implement reasonable security measures to protect personal data, including encryption, access control, monitoring for unauthorised access, and data backups.

Do You Know:

- In the year 2017, the central government established a Committee of Experts on Data Protection, which was led by Justice B. N. Srikrishna. The primary objective of this committee was to investigate and analyse matters pertaining to data protection within the country. The report was submitted by the Committee in July 2018.
- The DPDP Act propose to amend the Section 8(1)(j) of the RTI Act, 2005. This section prevents a public authority from sharing anyone’s personal information on two main grounds – that the disclosure will have no bearing on any public activity, and that revealing such information would cause unwarranted invasion of the privacy of an individual, unless such disclosure is justified in larger public interest.
- According to the proposed DPDP law, the two key grounds, that such information could be disclosed provided it serves a larger public interest, have been done away with.
- The RTI Act, which came into force in October 2005, was seen as a significant development towards freedom of information. It gave ordinary citizens the right to request information from government bodies, making authorities accountable for their actions and decisions.

AI MODELS ARE BEING ROLLED OUT, GUARDRAILS AND HYGIENE NORMS MUST FOLLOW

The last few years have witnessed a proliferation of AI models and their rapid adoption across the world. Private individuals, firms, and governments are experimenting with various AI tools. In



India, well known AI models are being rolled out either free or at minimal cost as tech firms scramble to acquire users and data to train their models. Many have partnered with telecom operators, giving them instant access to hundreds of millions of customers. Google, for instance, is offering its Gemini Pro free to select Jio users for 18 months. Similarly, Airtel subscribers can avail a free Perplexity Pro subscription. But the growing usage of these models comes with a set of concerns.

As per a report in this paper, questions are now being raised within the government on not only the data being uploaded but also the information being sought, and the inferences that can be drawn by the models. For instance, what are the implications of the data uploaded by millions, though anonymised, for the global firms and India — after all, data is the oil for the AI engine. Further, can the queries raised and the tasks being sought — by individuals such as bureaucrats, advisers, scientists, corporate leaders and others — be used for other purposes such as gauging their priorities, or determining their strengths or weaknesses? Worries over the implications of confidential information being uploaded have already led the finance ministry to reportedly ask its employees not to use tools like ChatGPT and DeepSeek on office devices.

These concerns come at a time of rising tech nationalism around the world. China, which has sought to build its own tech platforms, is already pushing its firms to adopt indigenous chips in AI data centres. In India, Union IT minister Ashwini Vaishnaw recently announced shifting to the Chennai-based Zoho's office suite. The Union government has also selected several firms to develop indigenous large language and small language models under its AI mission. While, over time, this could increase the choices available in the domestic market — foreign platforms currently dominate most product segments — users are likely to gravitate towards indigenous platforms only if they are more innovative and offer superior services/experiences. Either way, the guardrails need to be put in place, and norms of basic hygiene must be adhered to.

WHAT GOVT'S AI GUIDELINES MEAN FOR TECH REGULATION

The Ministry of Electronics and Information Technology (MeitY) has unveiled governance guidelines for Artificial Intelligence (AI), which could serve as a blueprint for how India regulates the technology, balancing innovation with accountability and growth with safety.

— The government had earlier signalled that it may not tighten the regulatory noose on AI just yet, as it believes the technology could help flourish an innovation economy in the country. As such, the guidelines recommend an India-specific risk assessment framework, a national AI incident database, and the use of voluntary frameworks and techno-legal measures, such as embedding privacy or fairness rules directly into system design.

— The guidelines do, however, flag the need to carry out effective “content authentication”, as synthetically generated images, videos and audio flood the Internet. Here, the government has already proposed legal amendments to a key legislation, which would require companies like YouTube and Instagram to add visible labels to AI-generated content.

— The launch of the guidelines comes ahead of the India–AI Impact Summit 2026, which will be the first-ever global AI summit hosted in the Global South.

— The report's key recommendations are organised around six pillars: infrastructure, capacity building, policy & regulation, risk mitigation, accountability, and institutions.



- Infrastructure: The report calls for expanding access to data and compute resources, including subsidised graphics processing units (GPUs) and India-specific datasets through platforms like AIKosh. It urges integration of AI with Digital Public Infrastructure (DPI) such as Aadhaar and Unified Payments Interface (UPI). It also urges the government to incentivise private investment and adoption by MSMEs, with tax rebates and AI-linked loans.
- Regulation: India’s approach will be agile and sector-specific, applying existing laws (like the IT Act and the Digital Personal Data Protection Act) while plugging gaps through targeted amendments.
- Risk mitigation: As stated earlier, the report proposes an India-specific risk assessment framework to reflect local realities, along with the use of voluntary frameworks and techno-legal measures.
- Accountability: A graded liability regime is proposed, with responsibility tied to function and risk level. Organisations must adopt grievance redressal systems, transparency reporting, and self-certification mechanisms.
- Institutions: The framework envisions a whole-of-government approach, led by an AI Governance Group (AIGG), supported by a Technology & Policy Expert Committee (TPEC), and technically backed by the AI Safety Institute (AISl).
- Capacity building: The guidelines emphasise AI literacy and training for citizens, public servants, and law enforcement. They recommend scaling up existing skilling programs to bridge gaps in smaller cities and enhance technical capacity across government institutions.
- Even as the government looks to encourage AI with little regulatory burden, there are internal red flags over data privacy and inference risks, especially when such systems are being used by key government officials.
- As per the draft amendments to the IT Rules, released last month, social media platforms would have to get users to declare whether the uploaded content is synthetically generated; deploy “reasonable and appropriate technical measures”, including automated tools or other suitable mechanisms, to verify the accuracy of such declaration; and, where such declaration or technical verification confirms that the content is synthetically generated, ensure that this information is clearly and prominently displayed with an appropriate label or notice.
- If they fail to comply, the platforms may lose the legal immunity they enjoy from third-party content, meaning that the responsibility of such platforms shall extend to taking reasonable and proportionate technical measures to verify the correctness of user declarations and to ensure that no synthetically generated information is published without such declaration or label.

Do You Know:

- Artificial intelligence (AI) refers to the field of computer science which aims to make computer systems think, reason, learn, and act to solve a complex system like humans.
- AI can be classified into two types: Artificial Narrow Intelligence (ANI) also known as weak AI and Artificial General Intelligence (AGI) also referred to as strong AI.



WHAT HAPPENS WHEN PUBLIC KNOWLEDGE IS CREATED ON PRIVATE INFRASTRUCTURE?

Over the past year, a considerable amount of recognition for Machine Learning (ML) has gone to researchers working in or alongside large technology firms, even as recent advances in Artificial Intelligence (AI) have been financed and built on corporate infrastructure.

In 2024, the Nobel Foundation awarded the physics prize to John Hopfield and Geoffrey Hinton for contributions that enabled learning with artificial neural networks, and the chemistry prize to Demis Hassabis and John Jumper for protein structure prediction (alongside David Baker's computational design). Mr. Hassabis and Mr. Jumper were employed at Google DeepMind at the time of the award; Mr. Hinton had spent a decade at Google before departing in 2023. These affiliations don't erase the laureates' academic histories but they do indicate where prize-level research is now being performed.

This change rests on material conditions as well as ideas. State-of-the-art models depend on large computing clusters, curated data, and engineering teams. Google's programme to develop Tensor-Processing Units (TPU) for its data centres shows how fixed capital can become a scientific input rather than only an information technology cost. Microsoft's multiyear financing and Azure supercomputers for OpenAI reflect the same political economy from a different angle.

Case for public access

Any research with public provenance should return to the public domain. In this context, public money has supported early theoretical work, academic posts, fellowships, shared datasets, publishing infrastructure, and often the researchers themselves. In parallel, the points at which the value became excludable lay increasingly downstream: with respect to computing resources (shortened as compute), this includes rights to data and code, the ability to deploy models at scale, and decisions to release or withhold weights. This helps explain why recent Nobel laureates have been situated in corporate laboratories and why frontier systems are predominantly trained on private cloud systems.

In the 20th century, firms such as Bell Labs and IBM hosted prize-winning basic research. However, much of the knowledge then moved through reproducible publications and open benchmarks. Today, reproducing the work of Mr. Jumper, for example, can require large compute budgets and specialised operations expertise. As a result the concern isn't only that corporations receive prizes but that the path from a public insight to a working system is infrastructure and contracts controlled by a few firms.

The involvement of public funds should thus create concrete obligations at points where technology becomes enclosed for private control. If an academic laboratory accepts a public grant, the deliverables should include the artefacts that make the work usable, including the training code, evaluation suites, and weights in the AI models to be released under open licences. If a public agency buys cloud credits or commissions model development, procurement should require that the benchmarks and improvements flow back to the commons rather than become locked into a vendor.

Remove bottlenecks

The argument isn't that corporate laboratories can't do fundamental science; they clearly can. The claim is that public policy should reduce the structural advantages of private control. Consider the release of Google DeepMind's AlphaFold 2, which, together with its code and public access to



predictions, allowed researchers beyond the originating lab to run the system on (reasonably) standard hardware, retrieve large numbers of precomputed structures, and integrate their results into routine workflows. All this work was supported by public institutions that were willing to host and maintain the resources.

Where the corporate stack is indispensable, such as when training frontier models (with billions or trillions of parameters), claims about ‘responsible release’ often ironically translate to a closed release. Instead, a more consistent position should be to link risk management to a structured model of openness — perhaps one that includes staged releases, access to weights, open penetration testing tools, and a clear separation between safety rationales and business models — rather than allow private entities to resort to blanket secrecy in the name of safety.

The same logic applies to compute: that is, if computing resources become a scientific bottleneck, they should be treated as a public utility. National and regional compute commons should allocate resources for free or at-cost to academic groups, nonprofits, and small firms, and qualify them on open deliverables and safety practices. The ultimate goal is to restore the ability of public institutions to reproduce, test, and extend leading ML work without having to seek corporate permission. Without such a commons, however, publicly funded ideas will continue to be turned into working systems on private clouds and returned to the public as expensive information products.

Indeed, while it’s tempting to treat the entities employing the laureates and funding pipelines as separate issues, one symbolic and the other structural, they’re connected by the computing resources. The fact that the Nobel laureates worked at Google DeepMind reflects where teams with ML scientists, domain experts, data, and compute now operate. Likewise, the fact that the most visible systems of the past two years were trained on Microsoft Azure under a financing agreement explains who could attempt such training. Both facts reflect underlying resource concentrations.

Beyond industry vs academia

Public agencies’ response should be direct — by, say, tying funding to openness in grants and procurement and requiring detailed funding disclosures and compute-cost accounting in research papers. Where full openness would create unacceptable risks, agencies can use equity or royalties to fund compute and data commons that support the wider ecosystem. For corporate laboratories, on the other hand, their credibility should rest on measurable contributions to the commons.

Journalists and the public should also move beyond an ‘industry versus academia’ framing.

The relevant questions are who sets the research agenda, who controls infrastructure, who can reproduce results, and who benefits from deploying the resulting AI models. Interpreting the 2024 Nobel Prizes as industry victories alone would miss the point that the knowledge base is cumulative and relies on public inputs, while the capacity to operationalise that knowledge is clustered. Articulating this pattern allows us to recognise scientific merit while demanding reforms that ensure public inputs produce public returns — in code, data, weights, benchmarks, and access to compute.

To be sure, the central conclusion isn’t resentment about corporate salaries but responding to the fact that breakthroughs are increasingly occurring at the intersection of public knowledge and private infrastructure. The policy programme should be to reunite the layers where public and



private enterprises diverge — artefacts, datasets, and compute — and to bake this expectation into contracts and norms that govern research.

In these conditions, future awards can be celebrated with corresponding public benefit because the outputs that make the science usable will be returned to the public.

ADITYA-L1 GETS A CLOSE LOOK AT ERUPTIONS FROM THE SUN

Using the Visible Emission Line Coronagraph (VELC) payload aboard India's first dedicated space-based solar mission, Aditya-L1, scientists at the Indian Institute of Astrophysics (IIA), along with NASA, have collaborated to estimate the crucial parameters of a coronal mass ejection (CME), very close to its lift-off from the sun.

Scientists associated with the project said that these are the very first spectroscopic observations of a CME in the visible wavelength range.

They said that the unique spectroscopic observations with the VELC has let them study the CMEs very close to the sun's visible surface itself, for the first time.

"In addition, it provides a sustained view of the sun for 24 hours every day because of being at the sun-earth Lagrangian L1 location where the sun never sets," they said.

Taking advantage of these factors, V. Muthupriyal, VELC project scientist, and her colleagues at the VELC payload operations centre at the IIA estimated the electron density, energy, mass, temperature and speed of a CME very close to the sun.

Vital statistics

R. Ramesh, senior Professor at the IIA and principal investigator of the VELC project, told The Hindu that the observations are by far the closest to the sun where spectroscopic observations of a CME in the visible wavelength range have been obtained with a space coronagraph.

His team calculated that there are about 370 million electrons per cubic centimetre in the CME observed with the VELC. The corresponding number for the non-CME corona near the sun is much less, in the range 10-100 million electrons per cubic centimetre.

"The CME energy in the present case is approximately 9.4×10^{21} joules. The mass in the CME is nearly 270 million tons. For comparison, the mass of the iceberg that sank the Titanic is estimated to be 1.5 million tons. The initial speed of the CME is 264 km/sec. The CME temperature is 1.8 million degrees on the Kelvin scale," Professor Ramesh said.

More eruptions

He added that though there are observations of CMEs at comparatively larger distances from the sun, with instruments other than the VELC, an understanding of the parameters of a CME in relation to how much is lost from the sun during a CME per se is crucial, and the unique near-sun spectroscopic observations with the VELC is precisely providing us the necessary data.

Professor Ramesh added that with the sun nearing the maximum activity phase of the current sunspot cycle 25 and with the VELC now stabilised in its operations, more energetic eruptions from the sun are expected to be observed.



ISRO FINISHES ANOTHER KEY TEST IN PREPARATION FOR GAGANYAAN

ISRO conducts ‘integrated main parachute airdrop test’ for the Gaganyaan mission at Babina Field Firing Range in Jhansi, Uttar Pradesh. The test, held on November 3, was designed to verify the crew module’s stability in the event of a delay in the deployment of one of its main parachutes.

— The experiment used an IL-76 aircraft from the Indian Air Force, which carried a 7.2-tonne (6.5-metric-tonne) capsule mass simulator. The aircraft took off from the Babina Field Firing Range in Uttar Pradesh and released the dummy capsule from an altitude of 2.5 kilometers, triggering the deployment sequence of the Gaganyaan parachute system.

— An air drop test recreates the final leg of a spacecraft’s journey back to Earth. An aircraft or helicopter drops the spacecraft from a height to test various systems under different circumstances. These include the deployment of the parachute system if the mission is aborted mid-flight, system performance when one parachute fails to open, and the spacecraft’s orientation and safety during splashdown.

— According to ISRO, the crew module employs a complex parachute system consisting of 10 chutes: two that detach the compartment’s protective cover, two drogue chutes that stabilise and slow the capsule, and three pilot chutes that deploy the three main parachutes responsible for the majority of deceleration.

— The test validated the parachute system in “asymmetric disreefing” — where one of the two main parachutes unfurls slightly later than the other one, using step-by-step reefed inflation and pyro device disreefing.

— The deployment sequence demonstrated structural integrity and load distribution even in this extreme scenario.

— Several major milestones remain before the first crewed Gaganyaan mission to low Earth orbit. ISRO plans three uncrewed test flights, each carrying Vyomitra—a data-gathering half-humanoid robot.

— If testing proceeds as scheduled, India’s first astronauts could embark on their historic mission in early 2027.

Do You Know:

— Announced in 2018, Gaganyaan is India’s maiden human spaceflight mission. Originally scheduled for 2022, it is now expected in early 2027. A successful execution would put India among US, Russia, and China.

— The short-term goal is human spaceflight to LEO, the long-term: a sustained Indian human space exploration programme.

— Group Captain Prasanth Balakrishnan Nair, Group Captain Ajit Krishnan, Group Captain Angad Pratap, and Wing Commander Shubhanshu Shukla are India’s astronauts-designate.

— Analog experiments, like Gyanex, inform astronaut protocols: participants live in a confined mock module and follow space routines, including isolation, stress handling, and teamwork.



WHY DOES INDIA'S ROAD SAFETY SYSTEM KEEP FAILING?

The story so far:

On November 10, the Supreme Court took cognisance of two mass-casualty road crashes in Phalodi, Rajasthan (14 killed) and NH 163, Telangana (19 killed). More than 1.7 lakh lives were lost in 2023 alone due to road crashes.

What are the problems in licensing?

Licensing and training need to be the first line of defence against crashes, not just an administrative formality. The driver licensing system is meant to be a filtration process, determining who is fit to operate a vehicle and who is not. But, across much of India, driving licences can be obtained without formal training. Driving tests are often reduced to perfunctory turns on small test tracks. For commercial drivers, whose vehicles can weigh more than 15 tonnes and carry dozens of passengers, there is no structured, standardised safety training. And once a licence is issued, few checks are carried out to assess a driver's continuing skill, physical fitness, or mental alertness. Heavily fatigued drivers — some with compromised vision or chronic illness — routinely operate heavy vehicles carrying unsuspecting passengers, with no mechanism to detect or restrict them.

What is the role of enforcement?

Speeding, overloading, lane violations, and driving under the influence remain among the top causes of fatal crashes. Enforcement against these, however, continue to rely heavily on resource-constrained and unskilled manual policing, making it inconsistent and susceptible to both human error and discretion. Even where technology exists — such as automated cameras and digital challan systems — coverage is limited, data integration is weak, and penalties are often not recovered. The Supreme Court has repeatedly emphasised the need for electronic enforcement standards and technology-based deterrence. But adoption remains patchy across States.

What about weak infrastructure?

From poorly banked curves and no crash barriers to inadequate illumination and missing rest areas that force heavy vehicles to park on the highways, the physical environment of India's highways and urban roads often turns minor mistakes into fatal outcomes. Many State and national highways were designed decades ago for speed and throughput, not safety. The result has given way to 'unforgiving roads' — corridors where a moment's lapse can mean disaster. Maintenance gaps such as broken dividers, exposed concrete structures, unmarked construction zones, and encroachments are common. In urban areas, pedestrian infrastructure remains minimal or absent, leaving those on foot to compete with heavy vehicles for space.

Evidence from pilot projects show that design-led interventions can reverse this trend. On the Mumbai-Pune Expressway, for instance, evidence-based engineering and enforcement changes under the Zero Fatality Corridor programme have cut crash deaths by more than half.

How can trauma care be improved?

For many victims of road crashes in India, survival depends not on the impact itself, but on what happens in the critical hour that follows. Ambulance networks vary widely in availability and efficiency across the country. In rural areas, delays in decisive care can stretch beyond an hour;



even in cities, victims are often extracted by bystanders or the police without proper equipment and little to no medical support. Facilities closest to crash sites often lack trauma specialists, blood banks, or basic resuscitation facilities. A proposed Right to Trauma Care law could mandate time-bound emergency response standards and a coordinated trauma network.

Moreover, licensing, infrastructure, and trauma care are treated as separate silos managed by different departments. Safety can only be achieved when they function as one, reinforced by accountability and coordination.

WHY HEPATITIS A DESERVES A PLACE IN INDIA'S UNIVERSAL IMMUNISATION PROGRAMME

As India debates the inclusion of the typhoid conjugate vaccine in its universal immunisation programme, it is time to ask whether Hepatitis A — a growing cause of acute liver failure — deserves even greater priority. A safe, effective, and long-lasting indigenous vaccine already exists; what is missing is the policy decision. India's Universal Immunisation Programme (UIP) has been one of the most successful public health initiatives in the developing world. It eradicated polio, curbed measles deaths, and saved millions of young lives. Yet as the country's health landscape changes, so too must its immunisation priorities.

A recent article in *The Hindu* made a strong case for introducing the typhoid conjugate vaccine (TCV) into the UIP. The argument is compelling: India bears half of the world's typhoid burden, manufactures multiple WHO-prequalified TCVs, and yet has not included them in its national schedule.

However, as we assess new vaccines for inclusion, scientific evidence and public-health impact must guide our choices. On these counts, Hepatitis A vaccination may deserve even higher priority.

On Hepatitis A

Hepatitis A, by contrast, is a silent but mounting threat. For decades, the virus infected most Indians in early childhood, causing mild illness and conferring lifelong immunity. With improved sanitation and hygiene, that pattern has changed. Fewer children are exposed early, leaving many adolescents and adults unprotected — groups in whom the disease is far more severe.

In recent years, multiple outbreaks in Kerala, Maharashtra, Uttar Pradesh, and Delhi have underscored this shift. Hospitals have reported clusters of acute liver failure and even deaths. Unlike typhoid, there is no specific treatment for severe Hepatitis A; recovery often depends on supportive care. Seroprevalence studies reveal a steady decline in protective antibodies — from over 90% two decades ago to less than 60% in many urban regions. The result is a growing pool of susceptible young people vulnerable to serious illness. Hepatitis A is no longer a benign childhood infection; it is an emerging public health concern.

The good news is that Hepatitis A is entirely preventable. Both live-attenuated and inactivated vaccines offer protection rates exceeding 90 to 95%, with immunity lasting for at least 15 to 20 years — often lifelong. India has its own indigenous success story here. Biological E's Biovac-A, a live-attenuated vaccine developed domestically, has been used in the private sector for more than two decades with excellent safety and efficacy records.

Unlike typhoid vaccines, Hepatitis A vaccines do not face issues of waning immunity, antibiotic resistance, or carrier states. A single dose of the live vaccine can confer durable, long-term



protection. From a public health perspective, it is a model vaccine: safe, effective, long-lasting, and already made in India.

Both typhoid and Hepatitis A cause significant illness, but their epidemiology and control prospects differ sharply. Typhoid mortality has declined with prompt antibiotic treatment and better sanitation, though antimicrobial resistance remains a concern. Hepatitis A, on the other hand, strikes indiscriminately across socio-economic groups, lacks specific treatment, and increasingly affects older children and young adults, where the disease is more severe.

Measurable criteria

When judged by measurable criteria — disease burden, vaccine efficacy, durability, cost-effectiveness, and programmatic simplicity — the balance tilts decisively toward Hepatitis A. It is the low-hanging fruit of vaccine-preventable diseases: a single-dose, long-lasting, with an indigenous product ready for universal use.

India could begin by introducing Hepatitis A vaccination in States that have experienced repeated outbreaks or show declining antibody prevalence. The vaccine can be co-administered with existing boosters such as DPT or MR, using the same infrastructure. Periodic serosurveys can track population immunity and guide expansion. This phased approach aligns with the UIP's proven model of gradual, evidence-based rollout.

This is not an argument against typhoid vaccination; it is a plea for rational sequencing. Typhoid control is important, but Hepatitis A control is both easier and more cost-effective at this stage. The disease burden is substantial, the vaccine is home-grown, and the science is clear.

India's immunisation programme has repeatedly shown foresight — from the early inclusion of Hepatitis B to the introduction of rotavirus and pneumococcal vaccines. Adding Hepatitis A would be a natural next step in that continuum of progress.

HOLDING UP GLASS TO INDIA; SECURING STEWARDSHIP TO TACKLE AMR

Around mid-October 2025, when the World Health Organisation (WHO) released its Global antibiotic resistance surveillance report 2025 (GLASS), there was hardly any surprise in the quarters in which antimicrobial resistance usually gets a rise. No one was surprised that antimicrobial resistance (AMR) in India "is a serious and escalating threat, with resistance rates among the highest in the world."

The report, which draws on data from over 100 countries, noted: In 2023, approximately one in three bacterial infections in India were resistant to commonly used antibiotics, mirroring severe trends across South-East Asia. Globally, the report said, one in six confirmed infections were resistant, with India disproportionately affected due to factors including high infectious disease burden, overuse and misuse of antibiotics, and gaps in surveillance and healthcare infrastructure.

For India, the report underlined the following aspects: High resistance rates to major antibiotics, especially in serious infections such as those caused by E.coli, Klebsiella pneumoniae, and Staphylococcus aureus, particularly in hospital ICUs; the challenging factors that aggravate AMR are widespread over-the-counter antibiotic access, self-medication, incomplete courses, environmental contamination (from pharmaceutical manufacturing and hospital waste), and uneven enforcement of regulations.



The report also provided a hat tip to national initiatives such as the National Programme on AMR Containment and the growing lab network in India, in trying to stem the tide, but concluded that several significant issues remain to be addressed, including insufficient funding and limited coordination between human, animal, and environmental health.

While India participates actively in GLASS, most surveillance data comes from tertiary hospitals, not fully representing the community or rural areas. Notably, India enrolled in the WHO's GLASS in 2017.

Incomplete data

Abdul Ghafur, senior consultant, infectious diseases, says: "The AMR levels in India are among the highest globally, particularly for gram-negative pathogens. This is entirely consistent with the national surveillance data from ICMR's AMRSN / i-AMRSS and NCDC's NARS-Net." These are two complementary surveillance networks for AMR in India.

Dr. Ghafur says, these datasets have a fundamental limitation in that they largely originate from top tertiary care hospitals (medical colleges or referral centres) where severe, complicated infections and high antibiotic pressure are common. "This does not incorporate bacterial susceptibility data from the vast network of secondary or primary care hospitals, which see very different patient populations, antibiotic usage patterns, and microbiological ecologies. The result is that the national "resistance rates" we cite are likely a biased overestimate of the country-wide average — reflecting the more extreme end of the spectrum rather than the full distribution of resistance."

V. Ramasubramanian, senior infectious diseases specialist, also touches upon the issue of inconsistent representation. "This is a vast nation with huge diversity, we need to have [AMR surveillance] centres spread across the country. Unless we correctly interpret susceptibility patterns, we may be drawing erroneous conclusions."

The WHO too urges for more complete nationwide surveillance, rational antibiotic use, and stronger regulation, warning that without urgent improvements, routine infections in India may increasingly become untreatable, leading to higher mortality and pressure on the healthcare system.

Kerala model

A key factor for the worsening situation is attributed to snail's pace progress on implementation of India's National Action Plan on Antimicrobial Resistance (NAP-AMR). "While the national framework set a strong vision in 2017, only a few States have formally launched or operationalised their State Action Plans on AMR; even among these, most remain in the very early stages of execution," Dr. Ghafur explains.

Apart from Kerala, no other State has done anything significant in terms of AMR, adds Dr. Ramasubramanian. The Kerala Antimicrobial Resistance Strategic Action Plan was rolled out in 2018 and took the path of inter-sectoral collaborations and One Health to handle AMR. The State went on to launch "AMRITH" (Antimicrobial Resistance Intervention for Total Health) in January 2024 to stop the over-the-counter (OTC) sale of antibiotics. In the latest antibiogram released by the State government, a slight dip has been noticed in AMR levels.



AMR literacy

Kerala also aims to become antibiotic-literate by December 2025 through awareness programmes and proper antibiotic use initiatives. Yewande Alimi, One Health Unit Lead, Africa CDC, says the key now is for the world to have a basic understanding of the role of bacteria. “We need to spread information very early about the importance of the bacterial world in our life,” she said during a recent webinar on Antimicrobial Resistance — A Global Health Security Crisis organised by the AIDS Healthcare Foundation (AHF), in collaboration with the University of Miami Public Health Policy Lab.

Ella Balasa, patient advocate and consultant, also fleshed out the same theme. “Awareness is really valuable. I would suggest we bring together large non profit groups, bring a face to the crisis and problem. That is the way by which we can get the general population to relate to the issue more easily. That is currently where we have the disconnect: AMR to the general population is abstract. We must humanise it, and bring it into their lives, that’s how we are going to bring solutions.”

Colistin ban

One significant intervention that has benefitted the country is the 2019 ban on colistin — being widely used as a growth agent in animal husbandry in India until then. Dr. Ramasubramanian says: “Intuitively, we know it will help, but quantification of how much it has helped will only be possible after long-term studies”. Simply and consistently implementing State and national policies on AMR will go a long way in ameliorating the situation, he adds.

There is little doubt that but for pockets of progress, India’s antibiotics stewardship is all but flailing and needs resuscitation. The thing is we do know what to do, experts say. For a first, it is essential to bring in more centres reporting resistance, Dr. Ghafur insists: “To obtain truly representative national estimates, India must adopt a full-network model: draw in the 500+ NABL labs that already exist, and invest in building microbiology capacity in peripheral and primary care tiers.”

Newer antibiotics

Tackling the problem from the other side would be to develop newer antibiotic models. Vasam Sambandamurthy, Senior Vice President at Bugworks Research Inc, a clinical stage biopharmaceutical company that is developing novel class of broad-spectrum antibacterial agents and immunotherapies, points out that several antibiotics have been launched in the last two years. In India, the approval of the CDSCO has been granted to four new antibiotic candidates while six other candidates have received approval for use globally.

He adds: “What is encouraging is that the 2024 WHO report on the antibiotic development pipeline shows a modest increase in antibacterial agents, with 97 candidates in clinical and preclinical stages in 2023 versus just 80 in 2021. Unfortunately, the pipeline remains thin in terms of truly innovative antibiotics. Only 12 of the 32 traditional antibiotics in development meet WHO innovation criteria (new class, new mode of action, no cross-resistance), and just four target WHO’s highest priority critical pathogens, particularly MDR Gram-negative bacteria.”

Dr. Sambandamurthy says the availability of newer antibiotics in India does have the potential to significantly alter the AMR landscape. But, despite this sliver of hope, the current clinical pipeline and recently-approved antibiotics are insufficient to tackle the global AMR challenge given the



significant gaps in their spectrum, and availability across Low and Middle Income Countries (LMIC).

He says “new antibiotics should possess novel mechanisms of action or belong to new classes that bypass existing resistance pathways. They must target WHO’s highest priority MDR pathogens, including carbapenem-resistant Enterobacterales and Acinetobacter baumannii. In addition, demonstrating broad efficacy against MDR strains, offering both oral and intravenous formulations, and having a strong safety profile are essential. Furthermore, these antibiotics should suppress further resistance development, be accessible and affordable globally, especially in LMICs, and align with antimicrobial stewardship principles.”

Global efforts and funding

It’s important to understand the role of the AMR Industry Alliance in countering AMR globally. Dr. Sambandamurthy who sits on the board of this alliance says the organisation aims at accelerating discovery and development of new antibiotics and diagnostic tools and strengthening equitable access to antibiotics, especially in LMICs, and implementing responsible antibiotic manufacturing standards.

Ultimately, funding shortages need to be tackled head on, Dr. Ghafur stresses: “Beyond the modest surveillance funding and a few innovation grants, there has been very little sustained financial or policy investment. Industry engagement, public awareness, and innovation funding are sporadic and small in scale.” This needs to change.

Just around the corner, this year’s World AMR Awareness Week (18–24 November) urges the world to “Act Now: Protect Our Present, Secure Our Future.” For India, it means embracing the staggering breadth of the problem and employing multi-pronged strategies that will improve its stewardship, resulting in reducing the rates of AMR in the community. If one State has managed to do that, then it is proof that what seems like a tide can indeed be stemmed.

RS 30 LAKH FINE, JAIL IN DRAFT BILL TO CURB SALE OF LOW-QUALITY SEEDS

The Centre Thursday unveiled the draft of a new Seeds Bill, proposing mandatory registration of seed varieties, and fines and imprisonment for major offences such as sale of “spurious” and non-registered seeds

— The draft of the Seeds Bill, 2025, was released by the Ministry of Agriculture and Farmers Welfare. Once enacted into a law, it will replace the current Seeds Act of 1966. The Bill proposes mandatory registration of seed varieties.

— The draft proposes stringent penal provisions and has offences in three categories — trivial, minor and major. Among the major offences are supply of “any spurious seeds”; supply of seeds of non-registered kind or varieties; and “doing the Business without registration as dealer or distributor or producer or seed processing or plant nursery”.

— For these major offences, the draft Bill proposes a maximum penalty of Rs 30 lakh and imprisonment for a term, which may extend up to three years. The Bill seeks to regulate the quality of seeds for sale and import, to facilitate production, and supply of quality seeds.

— The Ministry has invited comments on the draft till December 11. The government had brought Seeds Bills in 2004 and 2019, but they couldn’t become law.



Do You Know:

- The Indian seed industry was built on a strong foundation in the 1960s with the establishment of the National Seeds Corporation and further boosted with several enabling policies and regulatory support from the late '80s.
- The introduction of the Protection of Plant Varieties & Farmers Rights Act, 2001, and the release of Bt cotton hybrids for commercial cultivation in 2002 were important milestones towards the era of a technology-driven seed sector, which boosted the industry and helped Indian farmers with better productivity.
- The 1966 legislation was enacted at the time of the Green Revolution, when the country hardly had any private seed industry. The high-yielding wheat and paddy varieties, which made India self-reliant in cereals by the 1980s, were developed by the various ICAR institutes and SAUs.
- These public sector institutions have retained their dominance in breeding of wheat, paddy (including basmati), sugarcane, pulses, soyabean, groundnut, mustard, potato, onion and other crops, where farmers largely grow open-pollinated varieties (OPV) whose grain can be saved as seed for re-planting.
- Over the last three decades or more, however, private companies and multinationals have made significant inroads, particularly into crops that are amenable to hybridisation.
- The current Seeds Act, as already noted, applies only to notified varieties. Also, unless a variety or hybrid is notified, its seeds cannot be certified. Most of the private hybrids marketed in India, by virtue of not being officially “released”, are neither “notified” nor “certified”.
- Instead, they are “truthful labeled”. The companies selling them simply state that the seeds inside the packets have a minimum germination (if 100 are sown, at least 75-80, say, will produce plants), genetic purity (percentage of “true-to-type” plants and non-contamination by genetic material of other varieties/species), and physical purity (proportion of non-contamination by other crop/weed seeds or inert matter).

DOES INDIA NEED NUTRITIONAL TRANSFORMATION?

The story so far:

Society's relationship with food and nutrition is constantly evolving. The next transformation involves functional foods and smart proteins.

What are functional foods?

Functional foods are enriched foods that promote health or prevent disease, such as vitamin-enriched rice or omega-3-fortified milk. Functional foods leverage several technologies such as nutrigenomics (the study of how nutrition interacts with genes), bio-fortification, 3D food printing, and bioprocessing.

Smart proteins refer to proteins sourced using biotechnology that aim to reduce reliance on conventional production. These include plant-based proteins (restructured extracts from legumes, cereals, or oilseeds to mimic animal meat and dairy); fermentation-derived proteins (produced by microbial systems); and cultivated meat (animal cells grown in bioreactors without slaughter).



Why does India need them?

India's nutritional landscape remains highly uneven. More than one-third of Indian children are stunted, and although adult protein intake has improved, an urban-rural divide remains. As the economy grows and household incomes increase, societal expectations from food will change from being simply filling to being genuinely nourishing. This shift demands a reorientation of India's policy from ensuring food security to nutritional security, providing food rich in proteins, antioxidants, and vitamins to meet health and developmental goals.

The challenge lies in achieving this nutritional transformation while balancing sustainability. India must scale food production systems without worsening environmental degradation or deepening climate change impacts.

Where does India stand today?

Functional foods and smart proteins are a thematic area recognised under India's Biotechnology for Economy, Environment, and Employment (BioE3) policy. The Department of Biotechnology (DBT) and its public-sector partner Biotechnology Industry Research Assistance Council (BIRAC) have initiated funding programmes in these areas.

On the functional food front, scientists are developing bio-fortified crops such as zinc-enriched rice (developed at IIRR, Hyderabad) and iron-rich pearl millet (from ICRISAT). Several private players — Tata Consumer Products, ITC, and Marico — are investing in fortified staples and health-focused food lines. The smart protein ecosystem is also growing. In 2023, there were an estimated 377 products (meat, eggs, or dairy) sold by over 70 smart protein brands across India. Startups such as GoodDot, Blue Tribe Foods, and Evo Foods are pioneering plant-based meat and egg alternatives. The Centre for Cellular and Molecular Biology has received a substantial ₹4.5 crore grant from the DBT for research on cultivated meat.

While both segments are developing in India, there are several gaps, most notably in regulatory clarity. The Food Safety and Standards Authority of India (FSSAI) is yet to issue definitive guidance on novel foods such as cultivated meat or precision-fermented proteins.

How are other countries faring?

In the 1980s, Japan was the first country to put forth the concept of functional foods and devise a framework for its regulation. Smart proteins on the other hand, are a more novel category of food. Singapore became the first country to approve the commercial sale of cultivated chicken in 2020. China has prioritised alternative proteins as part of its food-security and innovation agenda. The European Union is investing heavily in sustainable protein production through its "Farm to Fork" strategy.

What should be the way forward?

On the health front, functional foods and smart proteins will be vital contributors to India's nutritional security. On the economic front, the global plant-based foods market is estimated to be anywhere between \$85 billion (as per UBS) and \$240 billion (as per Credit Suisse) by 2030. India, with its strong agricultural base and expanding biotech industry, could play a major supplier. If that happens, these industries could generate thousands of agriculture, manufacturing, and logistics jobs within India. However, India risks either lagging in innovation or facing a flood of unverified, mislabelled products. The transition to biomanufacturing will demand major workforce upskilling to enable employment of agricultural workforce, and poor implementation



could concentrate market power among a few large corporations. Public perception poses another challenge, and scepticism of “lab-made” food can only be overcome through transparent communication and public trust.

Therefore, a national regulatory framework for novel foods under FSSAI should provide clarity on definitions, safety evaluation, and labelling for functional and alternative protein products. Inter-ministerial coordination is also needed to ensure coherent policy support. Public-private partnerships can help scale biomanufacturing infrastructure and indigenise critical technologies such as precision fermentation. And finally, public education and inclusion of farmers in new value chains will be essential to ensure that biotechnology’s benefits extend across society.

SC TO EXAMINE IF FARMERS ARE EVADING SATELLITE SURVEILLANCE

The Supreme Court has decided to examine whether farmers are burning crop stubble when satellites are not overhead to evade surveillance. A Bench led by Chief Justice D.Y. Chandrachud expressed scepticism about claims that farmers were intentionally timing burns to avoid satellite detection.

Senior advocate Aparajita Singh presented photographs and data from a NASA scientist suggesting farmers in Punjab and Haryana monitor satellite schedules to burn stubble when not being observed. However, Chief Justice Chandrachud questioned the plausibility of farmers coordinating such activities.

The amicus curiae raised concerns about the reliability of this information and noted that uploaded photographs showed extensive stubble burning across Punjab, contradicting claims of limited incidents.

The court has issued notices to Punjab and Haryana to submit their latest reports on stubble-burning incidents. This follows an earlier September suggestion by the top court to return to criminal prosecution of offending farmers, though the Centre maintained it was a policy matter to take farmers along rather than punish them.

The debate intensified after Singh pointed out that despite “humongous” efforts and government funds to curb stubble burning, farmers continued the practice. She argued that the situation worsens at the beginning of every winter season despite Supreme Court orders to curb the practice.

EXPRESS VIEW ON INDIA GATE PROTEST: CLEAN AIR IS NOT CHARITY, IT IS EVERY CITIZEN’S RIGHT

On Sunday, the national capital awoke to a sepia cityscape, its skyline erased under a pall of toxic air. The Air Quality Index (AQI) breached 400 in several areas — “severe” yet unfortunately routine for this time of the year. Later in the evening, however, something unusual happened. Hundreds of citizens braved the smog to show up at India Gate — parents clutching their children, students with handmade banners, elderly citizens, masked and resolute, demanding clean air. In a city where the acrid smog has smothered what was once a beloved season, the gathering was a much-needed act of affirmation — that people will no longer be passive sufferers and that clean air is not charity from the state but a right of the citizen.



For years, India's political class has treated air pollution as a seasonal inconvenience at best and fodder for a partisan and polarising politics at worst. Blame has floated from the city-state to the Centre, farmers to industries, from motorists to Opposition governments in adjoining states, a fog of evasion thicker than the smog itself. Citizens, too, have been complicit in their inertia and resignation. The India Gate protest indicates a possible and potential rupture in that paralysis. It reframes pollution not just as an administrative lapse but also as a political betrayal, and clean air as a non-negotiable right. This new civic grammar starts with the recognition that clean air cannot remain the privilege of the wealthy with access to air purifiers or the means to escape Delhi's winter haze for mountain retreats, that the National Clean Air Programme (NCAP) must commit to sustainable, workable solutions, that it is the most fundamental of equalities — the breath that unites the rich and the poor, the young and the old.

Other nations have shown what sustained public pressure can achieve. Beijing faced a similar crisis a decade ago. Yet pressure from citizens, relentless monitoring, and political will turned the tide. There are, of course, differences between China and India — in this country, policy must navigate diverse and often conflicting interests. But other countries have also shown the way — like North Macedonia, a year ago, where huge popular protests against air pollution led to a clean-up plan that is being implemented. Here, if the India Gate protest is to be more than a symbolic moment, it must ensure that pollution is afforded the same urgency, and put to the same accountability test, at least in the political framing, that is reserved for inflation, corruption or unemployment. The battle for clean air cannot be left to policy papers and court orders alone. Only when citizens refuse to inhale institutional apathy will Delhi, and India, reclaim the air they deserve to breathe.

WHILE PROTESTING AGAINST AIR POLLUTION AT INDIA GATE, IT BECAME CLEAR TO ME: FOR THE STATE, CITIZENS ARE NOT THE PRIORITY

On November 9, a citizens' protest was called at India Gate against the increasing pollution and high AQI levels in Delhi. I responded to the call and participated in the protest along with over 500 other people. Several people were detained in buses by Delhi Police shortly after the protest commenced, and police asked the rest to protest at Jantar Mantar within the barricades. Most people didn't move.

While public officials in the state government can protect themselves with air purifiers, like the 15 worth Rs 5.45 lakh of public money recently purchased for the Delhi Secretariat, it is the masses who suffer the health consequences. The imperialist model of development causes destruction and displacement. The effects of this model of development can be seen in the floods and cloudbursts that ravage the Himalaya every year. It can be seen in the pollution in Delhi. In 2023 alone, according to global research organisations, in just Delhi, more than 17,000 people died from the pollution. It can be seen in the floods that devastated Punjab and Jammu and Kashmir earlier this year. It can be seen in the large-scale deforestation of Hasdeo Aranya — “the lungs of India”.

This “development” is not just ravaging India. Its effect can be seen in the burning of the Amazon, in the destruction of the Great Barrier Reef, in the loss of the Congo basin, which used to be the world's second-largest rainforest, and in numerous other examples. As students who are studying about society and how society functions, and why and how the things around us happen, I feel it is important to study the root causes of this destruction of the Earth, and challenge this model of development.



We must study the alternative people-centric models of development put forward by Adivasis of Bastar in their Janatana Sarkars and indigenous models from around the world.

Often, the state ends up protecting corporate interests. Yesterday, too, the state's actions did not protect citizens. The police detained women and men after sundown; they dragged people away. There were no female constables in our bus; they only arrived after this was pointed out to the police. These are not the actions of a state that prioritises the rights and health of its citizens.

DEADLINE COMING, GOVT MOVES TO CLEAR 214 LANDFILLS BY OCT NEXT YEAR

With less than a year left to the deadline of September 2026, Housing and Urban Affairs Minister Manohar Lal on Saturday launched a programme to completely clear 214 legacy landfills, which have a total of 8.8 crore metric tonnes of garbage piled up, in 202 cities.

— The Dumpsite Remediation Accelerator Programme comes at a time when just one year is left in the five-year Swachh Bharat Mission-Urban 2.0, which was launched in 2021 with the goal of clearing all legacy landfills in cities. As per the SBM-U website, as on Saturday, 49% of the area of legacy landfills was yet to be reclaimed and 41% of the waste was yet to be remediated.

— Launched at the National Urban Conclave here, the programme will focus on the 214 sites, which account for about 80% of the waste at the 1,428 legacy landfills that are yet to be remediated.

— Under the programme, the Housing and Urban Affairs Ministry said cities would be offered additional financial support for remediation and waste processing projects; corporate and public sector undertakings would be roped in for supporting the projects...

— The Minister also announced a new programme for enabling local bodies to raise private funds. The Urban Invest Window, a project of HUDCO, will help cities identify projects, mobilise capital and implement the project, as per the Ministry. HUDCO will repurpose its regional offices for this, it said.

Do You Know:

— Launched in 2021, the SBM Urban 2.0 has the target of clearing around 2,400 legacy landfill sites in the country by 2025-2026.

— To get funding from SBM Urban 2.0, cities are supposed to submit action plans to the Ministry of Housing and Urban Affairs for bioremediation of their legacy landfills and then reuse of the land cleared.

— The process involves sifting of the waste into different categories, leading to the creation of refuse derived fuel (RDF) for waste-to-energy plants, recycling of construction and demolition waste and bio-soil that can be used for road construction.

— While waste remediation involves processes that clean up and rehabilitate contaminated land, waste-to-energy technologies convert non-recyclable waste materials into usable forms of energy, such as electricity or heat.

— Several waste-to-energy systems have been developed to cater to different kinds of waste. Waste-to-energy technologies align with the United Nations Sustainable Development Goals,



particularly SDG 7 (Affordable and Clean Energy) and SDG 11 (Sustainable Cities and Communities).

— They also have the potential to reduce waste generation, minimise the adverse impacts of non-recyclable and toxic waste on the environment, and support the adoption of a circular economy.

GREENPEACE URGES MSC TO COMPLY WITH KERALA HC ORDER

The Greenpeace South Asia on Thursday released its new investigative report on the sinking of MSC Elsa 3 along the coast of Kerala.

The report exposes how MSC, the world's largest container carrier company, has systematically expanded its operations using ageing vessels and exploiting regulatory loopholes and flag-of-convenience practices that have caused environmental disasters in South Asia.

The report titled 'Below Deck: The Truth Beneath What You Sea (Mediterranean Shipping Company — MSC)' throws light on a corporate model that limits incident liability and externalises environmental and social costs onto weaker jurisdictions in the Global South.

Urging the MSC to comply with a Kerala High Court's order directing it to pay ₹1,227 crore as compensation, over 8,000 petitions and postcard signatures are being delivered to the MSC headquarters by volunteers.

The report notes that despite commitments to sustainable recycling, the MSC continues to systematically dispose of ageing ships in South Asian beaching yards, notably in India, Bangladesh, and Pakistan, where conditions are notoriously hazardous for both workers and the environment.

Environmental norms

The MSC announced plans to reflag 12 vessels under the Indian registry followed by discussions between MSC CEO Søren Toft and Prime Minister Narendra Modi during India Maritime Week 2025.

However, the report says such expansion should come with strict compliance with environmental and safety norms.

The MSC Elsa 3, a Liberia-flagged vessel with a known history of safety deficiencies, sank off the Kerala coast in May 2025, spilling oil, chemicals, and massive amounts of plastic nurdles that devastated marine ecosystems and coastal livelihoods.

The Greenpeace emphasised that the company should promptly comply with the High Court order and the Kerala government should ensure that compensation can reach affected communities as soon as possible, through a transparent mechanism.

INDIA 9TH AMONG COUNTRIES WORST HIT BY CLIMATE DISASTERS IN LAST 30 YEARS: REPORT

India has been ranked 9th in the list of countries worst affected by climate-related disasters in the last 30 years, according to the latest Climate Risk Index (CRI) report released by Germanwatch, a Bonn-based non-governmental organisation.



- The last time this index was prepared, in 2023, India was ranked eighth. India's rank has also improved in the list of countries worst affected by disasters in the previous year, from 10 in 2023 to 15 now. This could be due to a fewer number of disasters happening in India, but could also mean that the country has been steadily improving its resilience.

- Human Toll of Climate Disasters in India

- Deaths from Extreme Weather Events (1995-2024)

- 80,000 Lives Lost in India
- 9.6% of Global Climate Fatalities
- 832,000 Global Deaths Worldwide
- 430 Extreme Events in India

Deadly Climate Events Category

- Floods & Landslides
- Devastating Cyclones
- Extreme Heatwaves
- Severe Droughts

Notable deadly events include 1998 Gujarat cyclone, 1999 Odisha cyclone, 2013 Uttarakhand floods, Cyclones Hudhud and Amphan, and recurring heatwaves with temperatures above 50°C

- The report was prepared by analysing the present and historical climate data that are available in a public forum and was presented on the second day of the ongoing COP30 climate conference being held at Belém, Brazil.

- According to the report, globally 8.32 lakh lives were lost between 1995 and 2024 due to extreme weather events, out of which India has recorded 80,000 fatalities, or nearly 9.6% of the global number.

- The report states that in the past three decades as many as 430 extreme weather events like droughts, cyclones, heatwaves, and floods were reported in various parts of India, accounting for losses worth 170 billion USD.

Do You Know:

- Climate change has been “wreaking havoc” on Earth's water cycle by disrupting how water circulates between the ground, oceans and atmosphere, according to a new report. This has led to extreme precipitation, ferocious floods and droughts, which affected billions of people across the world in 2024.

- The report, '2024 Global Water Monitor Report', was produced in January 2025 by an international team of researchers from universities in Australia, Saudi Arabia, China, Germany, and elsewhere. For their analysis, the researchers used data from ground stations and satellites to access water variables such as soil moisture, rainfall etc.



- According to the WMO, 2025 is most likely to be among the top three warmest years ever recorded, following the near-surface temperature recorded between January and August this year, which was 1.42 degree Celsius (a deviation of 0.12 degree Celsius) above the pre-industrial era.
- The WMO stated that the concentrations of heat-trapping greenhouse gases and ocean heat content in 2025 continued the rising trend observed last year. The report also stated that the period between 2015 and 2025 would have individually been the 11 warmest years in the 176-year observational record.

GROWTH OF INDIA'S CO₂ EMISSIONS EXPECTED TO SLOW DOWN SIGNIFICANTLY IN 2025: STUDY

India's carbon dioxide emissions from fossil fuel sources are expected to increase by just about 1.4% in 2025, significantly lower than the 4% growth registered the previous year, new data released by Global Carbon Project (GCP) shows.

— India's fossil fuel-related emissions in 2024 were 3.19 billion tonnes of CO₂ equivalent and they are estimated to increase to 3.22 billion tonnes this year, according to the annual Global Carbon Budget study carried out by this project.

— The relatively modest growth in India's emissions this year was lower than even the United States whose emissions are expected to increase by 1.9%, possibly attributable to the climate-denialist policies of the Donald Trump administration.

— Fossil-related CO₂ emissions cover a wide range of sectors, including electricity generation, transportation, industrial processes, buildings and heating. These account for about 90% of all CO₂ emissions globally. The remaining 10% come primarily from land-use changes like deforestation and degradation of natural ecosystems.

— CO₂ emissions account for about 75% of global greenhouse gas emissions. Other significant greenhouse gases are methane, nitrous oxide and some fluorinated compounds.

— The latest GCP study shows that the growth of India's CO₂ emissions has slowed down not just this year. It has gone down even on the decadal scale. The average annual growth of India's emissions in the current decade (2015-2024) was 3.6% compared to 6.4% in the 2005-2014 period, the study shows. This could be a result of an expanding base effect as well as continuous improvements in carbon intensity of India's economy.

Do You Know:

— The GCP is an international collaborative programme that tracks global carbon cycles and emissions. It carries out the Global Carbon Budget study every year, which is published in the Nature journal and is timed to coincide with the annual climate conference COP30 currently being held in Brazil.

— GHGs are those gases in the Earth's atmosphere that trap heat. The Sun emits shortwave radiation or sunlight that passes through the atmosphere and is absorbed by the planet's surface to warm it. However, some of this sunlight is reflected back by the surface as infrared radiation (heat) which has a longer wavelength.



— GHGs such as CO₂ and methane (CH₄), which cannot absorb shortwave radiation, trap infrared radiation. That is because unlike oxygen or nitrogen molecules, CO₂ and methane are made up of three or more atoms, which gives them a larger variety of ways to stretch and bend and twist. This means that they can absorb a wider range of wavelengths, including infrared radiation.

— Simply put, GHGs act like a blanket that envelopes Earth and insulates it from the cold of space. This process of maintaining a warmer temperature is called the greenhouse effect. GHGs like CO₂, CH₄, and water vapour occur naturally and are a boon for the planet as in their absence there would not be the greenhouse effect without which there would not be liquid water and any form of life.

WHAT'S THE PLAN TO RELOCATE FOREST TRIBES?

The story so far:

The Union Ministry of Tribal Affairs has prepared a new policy framework that outlines the procedures to be followed when implementing existing laws governing the relocation of forest-dwelling communities from tiger reserves.

What is the brief?

This policy brief reiterates that relocations be considered a last resort and that if they are carried out, the rights of forest-dwelling Scheduled Tribes and others must be settled under the Forest Rights Act (FRA), 2006, first. Notably, the policy brief spells out mechanisms that allow these communities to continue residing within tiger reserves and also provides for measures that include them in the conservation and management of the biodiversity within the reserves.

What is the framework?

This policy brief titled “Reconciling Conservation and Community Rights: A Policy Framework for Relocation and Co-existence in India’s Tiger Reserves” was prepared by the Tribal Affairs Ministry in October this year. It calls for a National Framework for Community-Centred Conservation and Relocation, through which the Environment Ministry and Tribal Affairs Ministry can jointly set procedural standards, timelines, and accountability. It also suggests a National Database on Conservation-Community Interface (NDCCI) to record and track relocations, compensation, and status post-relocation. It recommends annual independent audits of relocation projects by empanelled agencies that assess compliance with the FRA, the Wildlife Protection Act (WPA), 1972 and human rights standards. The policy document also spells out consent procedures, specifying that consent for relocation must be obtained before any administrative notification declares an area as part of a tiger reserve. It adds that the consent must be verifiable, not just at the Gram Sabhas’ level, but also at the level of each household.

It further stresses that forest-dwelling communities residing within tiger reserves must have the option to exercise their rights under the FRA to continue living in their traditional forest habitats. In the framework, the Tribal Affairs Ministry has said that, “The State bears an affirmative constitutional duty to safeguard these rights (FRA rights of forest-dwellers) and may not curtail them except upon demonstrable ecological necessity.” The Ministry has stated that this policy framework is intended to develop a collaborative approach between the Ministries of Environment, Forests, and Climate Change, and Tribal Affairs so that “relocation, if undertaken, be voluntary, scientifically justified, rights-compliant, and grounded in equity and dignity”.



Why this policy brief now?

According to a letter to the Secretary of the Environment Ministry sent by the Tribal Affairs Ministry on October 22, this policy brief was prepared in the wake of several representations to the government over “serious concerns” about the “overall non-implementation” of the FRA in areas declared as tiger reserves and other protected areas. The letter communicating the policy brief to the Environment Ministry noted that these representations had come from State governments and Gram Sabhas that are within the boundaries of tiger reserves.

In June 2024, a directive from the National Tiger Conservation Authority (NTCA), calling for States to prioritise relocations from tiger reserves, had led to widespread protests from Gram Sabhas. This also led to representations to the National Commission for Scheduled Tribes (NCST) and the Union government, seeking the rollback of this directive.

Village relocations have been a feature of India’s efforts for tiger conservation from as early as 1973, and these have come to be governed by the twin operation of the WPA and the FRA. While the WPA empowered forest departments to create the spaces required to sustain tiger populations, the FRA mandated them to settle forest-dwellers’ rights to land, forest produce, and other forest activities, allowing them to either continue living in their habitats or to relocate them with a monetary package. In case the villagers choose to stay on, the administration is mandated to provide them with basic services and infrastructure. For relocation, guidelines provide an option for a monetary package, which currently stands at ₹15 lakh per family. But the process of relocating villages from forested areas being identified for tiger conservation has been controversial, with many forest-dwelling communities, often Scheduled Tribes, alleging that they were being pushed to opt for relocation when the FRA allowed them to continue living there, or accusing administrations of depriving them of basic facilities for choosing to stay on.

For instance, in the Nagarhole National Park in Karnataka, one such conflict is playing out in the State’s High Court, where the Jenu Kuruba community, a Scheduled Tribe Group, has argued that their rights to ancestral lands within the tiger reserves were not being recognised under the FRA.

According to a reply in Parliament this August, the Environment Ministry said that since January 2022, a total of 5,166 families from 56 villages were relocated from tiger reserves in as many as seven States across the country, such as Madhya Pradesh, Karnataka, Jharkhand, Maharashtra, Odisha, West Bengal, and Rajasthan. There were 591 villages and 64,801 families within the core areas of tiger reserves as of June last year, according to the NTCA.

Why does it matter?

While existing laws, rules, and guidelines for the relocation of villages from tiger reserves already mandate that village relocation must be voluntary and only carried out once it has been scientifically determined that no form of cohabitation with human settlements is possible, the gaps in the way these rules are implemented has necessitated their reiteration in the new policy brief from the Tribal Affairs Ministry. The current guidelines governing the relocation of villages from tiger reserve areas come from the NTCA, which operates under the aegis of the Union Ministry of Environment, Forests, and Climate Change.

The new policy brief from the Ministry of Tribal Affairs notes the need for monitoring the relocations being carried out under these guidelines, and suggests mechanisms for this that require more involvement and oversight from the Tribal Affairs Ministry’s representatives and outside experts.



What next?

The Tribal Affairs Ministry's letter to the Environment Ministry noted the "critical importance" of the points raised in the policy brief and has sought the latter's cooperation in this regard. The Tribal Affairs Ministry has said that this policy document should be circulated across Tribal Welfare and Forest Departments in the States, down to the district level.

THE GREAT NICOBAR PROJECT AND A MINISTRY IN KNOTS

In an important submission made before the National Green Tribunal (NGT) on October 30, 2025, the Union Environment Ministry admitted that the Great Nicobar mega infrastructure project will have a significant impact on this biodiversity and forest-rich island located at the extreme south of the Andaman and Nicobar chain.

The project that envisages an investment of ₹92,000 crore (₹72,000 crore in 2021) includes a transshipment port, an airport, a power plant and a greenfield tourism project and township. It has seen intense scrutiny and challenges before both the NGT and the Calcutta High Court.

Defending the environmental clearance granted to the project in November 2022, Additional Solicitor General Aishwarya Bhati, admitted before the NGT, in the latest hearing on October 30, that Galathea Bay, the site of the port and also the centre-piece of the project, had over 20,000 live coral colonies, over 50 nesting mounds of the endemic Nicobar Megapode (also a Schedule 1 species as per the Wildlife (Protection) Act 1972) and also an active nesting site of the Giant Leatherback turtle. Ms. Bhati noted that the Ministry was fully aware of the impact of the project and of its duty to undertake mitigation measures, given that it had prescribed conservation measures till 2052.

A finger points to the Environment Ministry

The fundamental questions that arise and which the Ministry would rather side-step is the need in the first place for the conservation and mitigation measures. Presenting the project as fait accompli and mitigation measures as a solution conceals, first, the Ministry's own complicity in allowing the project and second, the failure of its primary mandate of conservation and protection.

There are at least two important recent developments that underline this fundamental contradiction. First in 2021, the National Board for Wildlife (NBWL) denotified the Galathea Bay Wildlife Sanctuary that had been proposed in 1997 precisely for the protection of leatherback turtles, coral colonies, nesting populations of the megapode and important elements of biodiversity such as mangroves and salt water crocodiles. It can only be considered ingenious for the institution that created the wildlife sanctuary and has the statutory responsibility for its protection to first remove this protection, and then say that conservation and mitigation plans are being put in place.

Coastal regulation applies

The second issue is a category of land labelled by Indian law as coastal regulation zone (CRZ)-1A. Coastal areas which have mangroves, corals, turtle nesting beaches, sea grass beds and nesting grounds of birds and/or which are notified as protected areas (wildlife sanctuary and national park) are all included in CRZ-1A. These are areas with maximum protection and are, by implication, out of bounds for large construction projects such as the port in Great Nicobar.



Galathea Bay qualifies as CRZ 1A on all counts. This is where the Environment Ministry has tied itself up in multiple knots of its own making.

This became explicit and inescapable when an NGT order of April 2023 noted that the port site had 20,668 coral colonies and “that part of the project is in CRZ-1A area where Port is prohibited”. The NGT then appointed a high-powered committee to look into the matter, which in turn asked the Chennai-based National Centre for Sustainable Coastal Management (NCSCM), Ministry of Environment, Forest and Climate Change, to conduct a ground truthing survey.

Based on the survey, the layout provided by the project proponent, the Andaman and Nicobar Islands Integrated Development Corporation (ANIIDCO), and the clarification received from the Andaman and Nicobar Forest Department, the NCSCM concluded that no part of the project area fell under CRZ-1A. A confidential report that the NCSCM then submitted to the high-powered committee became the basis for its claim that the port site was not CRZ-1A. ANIIDCO’s affidavit in the NGT in September 2024 makes this explicit: “The HPC came to the conclusion that in the Report submitted by the NCSCM, it has been determined that construction of [a] port is permissible in CRZ-IB area but not permissible in CRZ-1A. The NCSCM, hence, concluded that no part of the project area is falling under CRZ-1A.”

Not only is the logic absurdly circular, but it is also important to note that neither the NCSCM’s report nor the high-powered committee’s submission to the NGT are in the public domain. The Ministry has repeatedly refused to release these, arguing that parts of the project are defence related even though denotification of the sanctuary and the downgrading to CRZ 1B were done entirely for commercial projects.

Galathea Bay is ecologically important

Importantly, Ms. Bhati’s most recent submission, that Galathea Bay has corals, megapode nests and the beach is used for nesting by leatherback turtles and in fact that the Ministry was well aware of this reality, confirms the continued importance of this location. The Andaman and Nicobar Islands Forest Department’s own data shows in fact that the beach at Galathea Bay saw over 600 leatherback nestings in the nesting season of 2024 — one of the highest ever recorded in Great Nicobar.

This being the case, it is not possible that Ms. Bhati and the high-powered committee/NCSCM report are both telling the truth. If Ms. Bhati’s submission and admissions before the NGT are indeed correct, Galathea Bay is still very much CRZ-1A and deserves the highest protection. This raises a serious question about the reports submitted before the NGT that argue otherwise. It is then not just a matter of the Ministry tying itself up in knots (which it surely has). It also raises fundamental issues of scientific rigour and procedural propriety and honesty.

INDIA, BOTSWANA ANNOUNCE CHEETAH TRANSLOCATION PACT

Botswana Wednesday formally announced the translocation of eight cheetahs to India amid President Droupadi Murmu’s state visit.

- On Thursday, the two heads of state will preside over an event where five of the eight captured cheetahs will be released into a quarantine facility at the Mokolodi nature reserve, marking the symbolic handover to India. The eight cheetahs are expected to reach India in a few months after undertaking quarantine procedures.



- President Murmu earlier visited Angola as part of her cumulative six-day state visit to both African nations — the first by any Indian head of state.
- During one-on-one meetings on Wednesday and delegation-level talks, the leaders of India and Botswana agreed to expand cooperation in sectors such as trade and investment, agriculture, renewable energy, health, education, skill development, defence and digital technology.
- The two leaders also witnessed the signing of a pact giving Botswana access to affordable Indian medicines.
- The President said her visit — the first of its kind from India to Botswana— marks an important milestone for bilateral relations. It comes ahead of the 60th anniversary of the establishment of diplomatic ties between the two countries in 2026.
- Noting that Indian entities were already “active” in Botswana’s diamond, energy, and infrastructure sectors, the president said there was a “scope” for collaboration in renewable energy, digital innovation, pharmaceuticals, and mining.
- This is the first-ever Presidential visit from India to Botswana. The President has been accompanied by Minister of State for Jal Shakti and Railways V Somanna and MPs Parbhubhai Nagarbhai Vasava and DK Aruna.

Do You Know:

- Africa is the world’s second-largest continent, covering about 30.3 million square kilometers, including adjacent islands. This constitutes about 20 per cent of Earth’s land area and 6 per cent of its total surface area. As the second-most-populous continent, Africa’s population of approximately 1.52 billion accounts for about 18 per cent of the world’s population. Algeria is Africa’s largest country by area, and Nigeria is its largest by population.
- The continent currently faces multiple challenges like poverty, deprivation, epidemics, control of natural resources, conflict, civil strife and insurgencies. It is also becoming a battleground for global power struggle.
- Almost every global and emerging power has established institutional mechanisms to regularly engage the continent, like FOCOC (Forum on China-Africa Cooperation) by China, TICAD (Tokyo International Conference on African Development) by Japan and IAFS (India-Africa Forum Summit) by India.
- Project Cheetah was launched in September 2022 and introduced African cheetahs into India from Namibia and South Africa. Initially, 20 cheetahs were imported from the two countries.
- The ambitious project has two overarching objectives. First, to establish a stable, breeding population of cheetahs in central India. Two, to use cheetahs as an umbrella species to restore open natural ecosystems such as scrubs, savannahs, grasslands, and degraded forests.

SHORT NEWS**HC: RIGHT TO MARRY PERSON OF CHOICE INTEGRAL TO ARTICLE 21**

Stating that the right to marry a person of one’s choice is integral to Article 21 of the Constitution, the Gujarat High Court recently dismissed a man’s petition seeking directions to the Anand police

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to lodge an FIR against officials who registered the marriage of his daughter immediately after an interfaith conversion in Rajasthan earlier this year.

The court said, “Prima facie interfaith marriage between two consenting adults by operation of the provisions of Section 3 (prohibition of forcible conversion) of the Act, 2003 interferes with the intricacies of marriage, including the right to the choice of an individual, thereby infringing Article 21 (Right to Life and Liberty) of the Constitution of India...”

RBI TRADE RELIEF MEASURES:

From loan moratorium to credit tenor extension, central bank offers support to exporters amid global trade disruptions

In a move aimed at providing relief to exporters facing debt servicing issues caused by global trade disruptions, the Reserve Bank of India (RBI) on Friday rolled out a set of trade relief measures, including debt moratorium, effective immediately, the central bank said on Friday.

The measures — including moratorium to eligible borrowers, extension of export credit tenor and relaxation in asset classification — are applicable to RBI’s regulated entities, including commercial banks, non-banking financial companies (NBFCs), primary co-operative banks, all-India Financial Institutions.

The announcement comes days after US President Donald Trump said the US will bring down tariffs on India, and that Washington is “pretty close” to reaching a “fair trade deal” with New Delhi. India currently faces 50 per cent tariffs, the highest on any country globally, primarily due to the ‘penalty’ duty of 25 per cent for purchasing Russian oil.

WHY 8TH CENTRAL PAY COMMISSION NEEDS BETTER INFLATION MEASUREMENT

Late last month, two key decisions were announced by the government. First, on October 28, the terms of reference of the 8th Central Pay Commission (CPC) were approved by the Union Cabinet, with the Commission given 18 months to submit its recommendations. Two days later, the Statistics Ministry released a discussion paper seeking feedback on the changes it wants to make in how housing inflation is calculated as part of the exercise to revamp the Consumer Price Index (CPI).

To measure inflation for housing — which has a weight of 10.07 per cent in the current CPI basket — the Statistics Ministry surveys more than 13,000 homes across over 300 towns. Of these, more than an eighth are homes given by the Central and state governments and public sector undertakings (PSUs) to their employees.

And this is where the problem starts, for MoSPI uses the House Rent Allowance (HRA) foregone by those living in these homes — along with a small licence fee that is paid — as a substitute for the rent that they pay to calculate housing inflation.

HRA does not depend on demand and supply but the person occupying the house. If one government or PSU staffer leaves the house surveyed by MoSPI and is replaced by a somewhat junior employee, the HRA reduces, leading to a fall in inflation — even though nothing has changed, apart from the occupant.



'MANY STATES ARE IN DIFFICULTY DUE TO FREEBIES, HIGH COMMITTED EXPENDITURE'

Stating that there is a thin line between investing money in productive assets and giving freebies, Finance Minister Nirmala Sitharaman on Tuesday said many states are “in difficulty” as such giveaways are piling up. Posing questions about states’ finances, she asked if there is no way to rationalise committed expenditure of states, especially if they are beyond affordable limits. The Centre has set a fiscal deficit target of 4.4 per cent of the GDP for the financial year 2025-26. After the Covid-19 pandemic, global debt levels of major emerging economies have worsened. The government has been working towards reducing its debt-to-GDP ratio, which refers to the share of a country’s national debt to its gross domestic product. In 2017, the NK Singh Committee had recommended a ceiling for general government debt of 60 per cent — 40 per cent for the Centre and 20 per cent for states. The general government debt level in India is currently over 80 per cent with the Centre’s share at about 57 per cent. In February, marking a significant shift from having fiscal deficit as the only operational target for fiscal consolidation, the government had outlined its intent to move to the debt-to-GDP ratio as the fiscal anchor from FY27 onwards. It has targeted a declining debt-GDP ratio to 50±1 per cent by March 31, 2031.

CHOUHAN ASKS OFFICIALS TO PROBE 'PALTRY PAYMENTS' UNDER PM FASAL BIMA YOJANA

Union Agriculture Minister Shivraj Singh Chouhan has ordered “thorough on-field investigations” into paltry payments, as low as Re 1, to farmers under the Pradhan Mantri Fasal Bima Yojana, saying it’s a “mockery”.

Chairing a high-level meeting in Delhi on Monday to discuss issues being faced by farmers regarding the insurance scheme, Chouhan said farmers shouldn’t feel troubled under any circumstances, a statement from the ministry said.

ARMED FORCES CARRY OUT MEGA DRILLS ALONG WESTERN BORDER TO TEST COMBAT READINESS

A mega tri-service military exercise kicked off earlier this week along the western border with Pakistan, the first joint drills at such a large scale since Operation Sindoor in May.

Additionally, a NOTAM (notice to airmen) was also issued Friday for a large-scale Indian Air Force (IAF) exercise in the North East in areas bordering China, Bhutan, Myanmar and Bangladesh.

The tri-service drills, Exercise Trishul, will go on till November 13 and will focus on the Western border, including the desert and the Sir Creek areas.

Sources said the three services will operationally test the entire spectrum of resources for efficacy and capability — T-90 and Arjun tanks, attack helicopters, missile systems, Rafale and Sukhoi-30MKI fighters, drones and a range of warships. Also taking part in the drills will be indigenous platforms and equipment that have been inducted or recently upgraded.

MALABAR NAVAL EXERCISE 2025

— The annual Malabar naval exercise between the navies of India, the US, Australia and Japan kicked off on November 12 in the Northern Pacific.



- The Indian Navy has deployed its guided missile frigate INS Sahyadri for the mega exercise being hosted by the US.
- Exercise Malabar was established as an annual bilateral training activity between India and the United States in 1992.
- Japan and Australia first participated in 2007, and Japan joined the naval exercise in 2015 as a permanent member, and Malabar became a trilateral exercise. In 2020, for the first time in over a decade, the exercise saw the participation of all four Quad members.

SAHAKAR DIGI PAY AND SAHAKAR DIGI LOAN

- Union Home and Cooperation Minister Amit Shah has launched two mobile applications—Sahakar Digi Pay and Sahakar Digi Loan—which will enable even the smallest urban cooperative banks to offer digital payment facilities.
- In July 2025, the government unveiled the new National Cooperative Policy 2025, replacing one in place for the past 23 years. It will be effective from 2025 to 2045, i.e., approximately until the centenary of India’s independence.
- The vision of the new cooperation policy is to build a Viksit Bharat by 2047 through ‘Sahkar Se Samridhhi’.
- Notably, the United Nations has declared 2025 the International Year of Cooperatives with the theme “Cooperatives Build a Better World”.

EXPORT PROMOTION MISSION

- The Union Cabinet has approved a six-year Export Promotion Mission (EPM) with an outlay of Rs 25,060 crore.
- Under EPM, priority support will be extended to sectors impacted by recent global tariff escalations, such as textiles, leather, gems & jewellery, engineering goods, and marine products.
- The Mission will operate through two integrated sub-schemes:
 - * Niryat Protsahan: Focuses on improving access to affordable trade finance for MSMEs.
 - * Niryat Disha: Focuses on non-financial enablers that enhance market readiness and competitiveness, including export quality and compliance support, assistance for international branding, and packaging.

NEW ROYALTY RATES FOR CRITICAL MINERALS

- The Union Cabinet has approved rationalisation of royalty rates for four critical minerals — graphite, caesium, rubidium, and zirconium.
- The decision aims to facilitate indigenous production and reduce imports of these minerals to avoid supply chain vulnerabilities.



Delving Deeper

Last year, a nine-judge constitutional bench in *Mineral Area Development Authority v M/s Steel Authority of India* ruled that Royalty is not a tax.

The majority held that a royalty is not a tax because there is a “conceptual difference” between royalties and taxes. Royalties are based on specific contracts or agreements between the mining leaseholder and the lessor (the person who leases the property) who can even be a private party.

Also, taxes are meant for public purposes such as welfare schemes and creating public infrastructure, whereas the payment of royalties is to a lessor in exchange “for parting with their exclusive privileges in the minerals”.

GOVT TO RELEASE NH BLACK SPOT DATA BASED ON REAL-TIME E-DAR

To prevent road accidents and fatalities, the Ministry of Road Transport and Highways (MoRTH) will soon release black spot data for 2023 and 2024 based on its ambitious Electronic Detailed Accident Report (e-DAR)/Integrated Road Accident Database (iRAD) system, which was developed to collect real-time data entered by state police.

Black spots on National Highways (NHs) are critical stretches where high rates of accidents are recorded. Under the existing system, a 500-m stretch is categorised as a black spot if there have been either five or more accidents involving fatalities or grievous injuries, or 10 deaths within a 3-year period.

WILDLIFE BOARD PANEL CLEARS 12 KEY DEFENCE PROJECTS IN LADAKH

THE STANDING committee of the National Board for Wildlife (SC-NBWL) has recommended approval for 12 key defence projects in Ladakh, of which, Defence Ministry has said, some are necessary for “high level of operational preparedness” in the context of “increasing assertiveness of People’s Liberation Army (PLA)”.

The latest round of approvals are in line with a push to ramp up infrastructure near the LAC in the aftermath of the 2020 Galwan clash with China that claimed the lives of 20 Indian Army personnel.

PANEL SEEKS HIGHER PROTECTION FOR RHESUS MACAQUE UNDER WILDLIFE ACT

The standing committee of the National Board for Wildlife (SC-NBWL), chaired by Union Environment Minister Bhupender Yadav, has recommended reinstating Rhesus Macaque species of monkeys under Schedule II of the Wildlife (Protection) Act, 1972, to restore statutory protection, enforcement against illegal capture, cruelty and to regulate its scientific management.

The matter of reinstating protection for the species was placed in the previous 85th meeting of the SC-NBWL for advice on policy framing. Subsequently, the ministry circulated a detailed questionnaire to Chief Wildlife Wardens of all states and Union Territories seeking reasoned statements.



DRISHTI SYSTEM

- Indian Railways is planning to install Artificial Intelligence (AI)-based technology-DRISHTI- to enhance the safety of freight trains. It is expected to bring greater transparency, visibility and technological assurance to freight security system.
- This new AI-based Locking Monitoring System 'DRISHTI' will reduce the traditionally manual checks which are not only time-consuming but also impractical for long-haul rakes under dynamic conditions.
- This new technology is being developed through a collaborative initiative between the Northeast Frontier Railway (NFR) and the Indian Institute of Technology Guwahati Technology Innovation and Development Foundation (IITG TIDF).

CBSE DRAFT: COMPUTATIONAL-THINKING SKILLS IN ALL SUBJECTS, FOUNDATIONAL CONCEPTS OF ARTIFICIAL INTELLIGENCE

Next academic year onwards, CBSE students, as young as those studying in Class 3, will likely find computational-thinking skills integrated in all subjects as the Board prepares to implement an AI-focused curriculum.

A draft artificial intelligence (AI) and computational thinking curriculum developed by the Central Board of Secondary Education (CBSE) for classes 3 to 12 also focuses on introducing foundational concepts of AI in the lower classes, along with advanced computational thinking and AI as compulsory subjects in classes 9 and 10, official sources said.

The curriculum is in line with the National Education Policy (NEP) 2020, which calls for the introduction of “contemporary” subjects like AI, design thinking, and holistic health in the curriculum.

IIT'S SLIP BUT INDIA ENTRIES AT RECORD HIGH; CHINA SURGES

Global higher education analysts QS Quacquarelli Symonds released the 2026 rankings for Asian universities on Tuesday. All but one of the top 10 Indian institutions in the QS rankings of Asian universities for 2026, including seven IITs, have seen their ranks fall sharply this year, with institutions in China, Malaysia, South Korea, and Singapore outperforming them. In the 2026 edition of the QS World University Rankings: Asia, five IITs among the top 10 Indian institutions—Delhi, Madras, Bombay, Kanpur, and Kharagpur – recorded their lowest rank in recent years. IIT Delhi, which is the country's top ranked institution for the second year in a row, stood in the 59th position this year, a steep fall of 15 ranks from last year's 44. From 2021 to 2025, the institute's rank has ranged from 44 to 47.

WHATSAPP, META GET NCLAT GO-AHEAD ON DATA SHARING

The National Company Law Appellate Tribunal (NCLAT) on Tuesday granted partial relief to Meta Platforms and its messaging arm WhatsApp in the long-running competition case arising from the platform's 2021 privacy policy update. While the appellate body upheld the Rs 213.14 crore penalty imposed by the Competition Commission of India (CCI), it set aside key findings related to dominance and overturned the five-year prohibition on user-data sharing with Meta group companies for advertising purposes.

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ON BIRSA MUNDA'S BIRTH ANNIVERSARY, LET'S CELEBRATE HIS FIGHT FOR DIGNITY

From the Ulgulan movement led by Birsa Munda to the fierce resistance of Alluri Sitarama Raju, Tantia Bhil, Veer Gundadhur, Rani Gaidinliu, Ramji Gond, Shaheed Veer Narayan Singh, Sidhu-Kanhu, and others, it demonstrated that tribal movements were not isolated revolts; they were sustained, powerful counter-narratives to colonial oppression. Their struggles have not only safeguarded tribal rights but also strengthened the broader fight for the nation's freedom and equality.

A historic decision was taken in 2021 by Prime Minister Narendra Modi to commemorate the birth anniversary of Birsa Munda (November 15) as Janjatiya Gaurav Diwas to recognise these Janjatiya leaders and their struggle. This monumental decision is a significant milestone, as it instils pride and knowledge about the rich heritage and struggles of tribal freedom fighters across generations.

HIMACHAL PRADESH HUMAN DEVELOPMENT REPORT 2025: CLIMATE-ADJUSTED HDI

- According to the Himachal HDI report released on 10th November, remote and sparsely populated districts — Kinnaur, Lahaul and Spiti, and Chamba — have emerged as the most resilient regions to climate-related risks in Himachal Pradesh.
- The report has been prepared jointly by the Department of Environment, Science, Technology, and Climate Change, Government of Himachal Pradesh, and the United Nations Development Programme (UNDP), India, under the theme “Building the Future in a Climate-Impacted World”.
- These districts recorded low Hazard Index or HI values compared to others. The values indicated a lower vulnerability to climate change and natural disasters.
- Districts like Solan, Bilaspur and Shimla, despite having higher Human Development Index (HDI) scores, were at the bottom of the CAHDI, due to their high exposure to climate risks.
- The HDR report computes the Climate-Adjusted HDI to illustrate the impact of climate hazards on human development in the state. This is calculated by discounting the human development index of a district by the district's Hazard Index that quantifies its exposure to climate-related hazards.
- According to the report, “Districts with a high risk of hazards are ranked lower in terms of overall climate-adjusted development, regardless of their original HDI score”.
- The Climate-adjusted HDI discounts a region's human development progress with its climate vulnerability, providing a more cautious measure of long-term development.

WILD POLIO VIRUS

- Germany has found the wild polio virus in a sewage sample in Hamburg, the first such detection in Europe since 2010.
- Polio, short for poliomyelitis, is an infectious disease that terrified parents worldwide for much of the first half of the 20th century. Affecting mainly children under five, it is often asymptomatic but can also cause symptoms like fever and vomiting.



— There are two forms of polio: wild polio and vaccine-derived or variant polio. Both can cause paralysis and death, but wild polio is rarer and now only endemic to Afghanistan and Pakistan, causing tens of cases annually. The strain found in German wastewater is linked to the strain circulating in Afghanistan.

— India was declared polio-free in January 2014, after three years of zero cases, an achievement that is widely believed to have been spurred by the successful Pulse Polio campaign.

RARE RODENT-BORNE VIRUS KILLED AFRICAN ELEPHANT AT DELHI ZOO: AUTOPSY

In what officials described as the first such case reported from any Indian zoo, Shankar, the lone African elephant at the National Zoological Park in Delhi, died in September due to the rare rodent-borne virus — encephalomyocarditis virus (EMCV). The findings have been revealed in an autopsy report from the Indian Veterinary Research Institute (IVRI), based out of Bareilly in Uttar Pradesh. The 29-year-old bull elephant — brought from Zimbabwe in November 1998 — was a diplomatic gift to former President of India Shankar Dayal Sharma. After spending 13 years in solitary confinement, the elephant died on September 17 in its enclosure.

GLOBAL TUBERCULOSIS REPORT 2025

— The World Health Organisation released the Global TB Report 2025 as a comprehensive and up-to-date assessment of the TB epidemic, and of progress in prevention, diagnosis, and treatment of the disease, at global, regional, and country levels.

— The Global TB Report 2025 shows that India has achieved only a 21% reduction in new cases and a 28% reduction in deaths between 2015 and 2024. This does not even come close to the End TB milestones for 2025 — a 50% reduction in TB incidence and 75% reduction in TB deaths.

— According to the report, in 2024, India recorded around 27.1 lakh cases and more than three lakh deaths, making it one of the top contributors to the number of TB cases across the world.

— India diagnosed the highest ever 26.18 lakh cases in 2024, further closing the gap between the estimated number of cases and the ones actually diagnosed.

— There is a significant improvement in India's treatment coverage, which stood at 92% in 2024, increasing from 85% in 2023.

— TB is caused by an organism called mycobacterium tuberculosis, which mainly affects the lungs, but can also impact other parts of the body. TB spreads through the air when an infected individual coughs, sneezes, or speaks.

World Tuberculosis Day

World Tuberculosis Day, observed on March 24 every year, aims to increase public awareness about the global epidemic of tuberculosis (TB) and the numerous efforts being taken to eliminate the disease. The date marks the day in 1882 when Dr. Robert Koch announced that he had discovered the bacterium that causes TB, which opened the way towards diagnosing and curing this disease. The theme of this year is "Yes! We Can End TB: Commit, Invest, Deliver", highlights the importance of stronger commitments and action, especially against rising drug-resistant TB.



2025 LANCET COUNTDOWN REPORT ON HEALTH AND CLIMATE CHANGE

According to the report, the number of climate change-related deaths was in the millions, and millions more were affected by extreme heat, extreme rainfall and flooding, ever more vicious storms and creeping desertification.

* The rate of heat-related mortality has increased 23% since the 1990s, pushing total heat-related deaths to an average 546 000 deaths per year.

* The average person was exposed to 16 days of dangerous heat in 2024 that would not have been expected without climate change, with infants and older adults facing a total of over 20 heatwave days per person, a fourfold increase over the last twenty years.

* Heat exposure caused 640 billion potential labour hours to be lost in 2024, with productivity losses equivalent to US\$ 1.09 trillion.

* Climate action benefits, as highlighted in the report, state that there were an estimated 160,000 premature deaths avoided every year between 2010 and 2022, from reduced coal-derived outdoor air pollution alone.

BELEM HEALTH ACTION PLAN

— The Belem Health Action Plan, a flagship outcome of Brazil's COP 30 Presidency, was unveiled on the dedicated Health Day of COP30 – 13 November 2025.

— It is aimed at strengthening global health systems to cope better with the impacts of climate change. It is structured around two cross-cutting principles and concepts: health equity and 'climate justice' and leadership and governance on climate and health with social participation.

— Under the ambit of 'The Climate and Health Funders Coalition', over 35 leading philanthropies united to address the escalating public health crisis driven by climate change. They committed an initial \$300 million to tackle both the causes of climate change and its consequences for health.

— This money would also support the implementation of the Belem Health Action Plan and be used for accelerating health solutions where they are needed the most, a statement said.

— The 2025 Lancet Countdown Report on Health and Climate Change, which has documented the global health impact of climate change, is the basis for the Belem Action Plan on Health.

COP32

— Ethiopia has been confirmed as the host of the 32nd edition of the annual climate change conference (COP32) in 2027, even as the choice of next year's host remains uncertain.

— Ethiopia will organize COP32 in its capital city, Addis Ababa, the country announced in Belem, Brazil where the COP30 meeting is currently happening.

— The host country of COP31 next year is still undecided, with both Australia and Turkiye persisting with their candidature.

— The COP meetings are held by rotation in five UN-designated geographical regions – Africa, Asia-Pacific, Eastern Europe, Latin America and Caribbean, and Western Europe and Others.



Countries volunteer to host the event. But if there are more than one candidate, the respective geographical region selects one by consensus.

— Meanwhile, India has expressed its intention to host the COP33 event in 2028, when the conference returns to the Asia region. If allocated, it would be the second time that India will host a COP. New Delhi had hosted COP8 in 2002.

What is COP?

COP is the governing body of the United Nations Framework Convention on Climate Change (UNFCCC), an international treaty signed in 1992 that provides a basis for climate negotiations.

Each year, the COP brings together representatives of the Parties (countries that have ratified the UNFCCC) to assess progress, negotiate further agreements, and refine commitments.

COP is the world's only multilateral decision-making forum that brings together almost every country on the planet to formulate and implement policy responses to climate change collectively. Currently, there are 198 parties (197 countries plus the European Union) to the UNFCCC.

NATIONAL PRESS DAY

— November 16 is observed as the National Press Day to celebrate the role of a free and responsible press in India. The day commemorates the establishment of the Press Council of India, which began its operations on this day in 1966.

— This year's theme focuses on safeguarding press credibility amidst rising misinformation, highlighting the growing importance of accurate and ethical reporting.

BOOKER PRIZE 2025

— David Szalay has been named the winner of the 2025 Booker Prize for his novel *Flesh*.

— *Flesh*, Szalay's sixth work of fiction, is a taut, time-spanning novel that moves from a Hungarian housing estate to London's gilded enclaves. Written in his trademark spare prose, it dissects detachment and longing with surgical precision. *Flesh* focusses on an emotionally detached man who is unravelled by a series of events beyond his grasp.

— Six authors were shortlisted for the Booker Prize 2025: Kiran Desai (*The Loneliness of Sonia and Sunny*), Andrew Miller (*The Land in Winter*), David Szalay (*Flesh*), Susan Choi (*Flashlight*), Katie Kitamura (*Audition*), and Benjamin Markovits (*The Rest of Our Lives*).

— Indians who have won the Booker Prize: V.S. Naipaul (*In a Free State*, 1971), Salman Rushdie (*Midnight's Children*, 1981), Arundhati Roy (*The God of Small Things*, 1997), Kiran Desai (*The Inheritance of Loss*, 2006), and Aravind Adiga (*The White Tiger*, 2008).

SAALUMARADA THIMMAKKA

— Noted environmentalist and Padma awardee Salumarada Thimmakka passed away at the age of 114 on 14th November.



— Thimmakka, renowned as the ‘Tree Woman of India’ who planted thousands of trees around her village in south Karnataka, is set to have a funeral with full state honours on Saturday afternoon at her village.

— She was the recipient of many awards, including the Padma Shri award in 2019 for her afforestation efforts, the Nadoja Award, the Karnataka Kalpavalli Award, and the Godfrey Phillip Award.

ANISH BHANWALA

— Anish Bhanwala became the first Indian shooter to ever win a medal in the men’s 25m rapid fire event at the World Championships with a silver in the final at Cairo, Egypt.

— India has sent a 40-member squad to Cairo for the ongoing World Championships. The contingent includes Paris 2024 Olympic medallists Manu Bhaker and Swapnil Kusale.

REMEMBERING V. RAJARAMAN

The software programming and services sector in India has done remarkably well. Computer programming that started in a small way in academic institutions in the 1960s developed into a formidable industry in a few decades. This was possible due to the rapid spread of programming skills even before full-fledged graduate and postgraduate courses.

These efforts were pioneered at the IIT-Kanpur under Vaidyeswaran Rajaraman, who was awarded the Padma Bhushan in 1998. He passed away on November 8.



DreamIAS



BUSINESS AND ECONOMY

TOKYO TUTORIAL: COUNTERING CHINA'S RARE EARTHS CHOKE

China may have agreed to pause for one year its sweeping export controls on rare earths, but this hiatus offers only partial relief to global rare-earths users after a tumultuous few months. It is being seen more as a window of opportunity to re-strategise, till China weaponises trade in these elements again.

- For countries looking for solutions, Japan offers a replicable template. Long before China's wolf warrior approach to multiple rare earth elements and magnets widely used in the automotive, robotics and industrial sectors, Japan tweaked its approach to supply chain resilience after unwittingly emerging as the canary in the coal mine for China's mineral dominance.
- On September 7, 2010, a Chinese fishing boat collided with two Japanese coast guard vessels off the islands of Senkaku in the East China Sea, following which the coast guard arrested the boat's captain. Among the Chinese government's responses was stopping the export of rare earth minerals to Japan, which sent the Japanese industry into complete panic.
- At the time of the ban, Japan was dependent on China for nearly 90 per cent of its imports of these minerals. While the kerfuffle was eventually resolved after the release of the boat captain, the prices of rare earths surged 10 times in a year following the incident.
- Alongside stockpiling, recycling and pushing alternative technologies, Japan has, after the 2010 incident, invested heavily into non-China rare-earth projects. This includes Australia's Lynas Rare Earths, the world's largest rare earth producer outside of China.
- Japanese companies also invested in the facilities needed to process and refine the materials into inputs that can then be used by its industries. As a result, Japan's overall dependence on Chinese rare earths has now dropped to below 60 per cent, according to data provided by London-based Argus Media.
- The consumption of rare earths in Japan now is well under half the level of what it was in 2010, offering proof of how effective these steps have been.
- The fishing boat incident was a wake-up call for Japan, as the sudden blockade ostensibly caught policymakers by surprise even though the vulnerability in the supply of rare earths was evident to most people. At some point, for policy makers across geographies, it makes sense to analyse the vulnerability of the country's supply chains.
- A proactive assessment across all critical supply chains could help, especially entailing overdependence on one or a small group of suppliers from one country, even one that has not actively weaponised trade.
- The Japanese response also shows the need for a comprehensive, multi-pronged policy approach. Rather than relying on a single measure, Japan diversified its sources, allocated money for technology and alternative materials, and spent years building strategic reserves, all while maintaining a long-term vision through recycling initiatives.
- The other lesson is that like-minded countries need to get together to tide over vulnerabilities, including possible stockpiling of the kind that Japan pursued for REs after 2010.



- India is, however, hoping to ramp up its exposure to rare earths. In November last year, the country launched an auction for seven seabed blocks in the Andaman Sea for exploration and eventual mining. These blocks are estimated to hold polymetallic nodules and crusts, which can contain heavy rare earth metals.
- The Union Cabinet on Wednesday approved rationalisation of royalty rates for four critical minerals — graphite, caesium, rubidium, and zirconium — considered critical for green energy. The decision aims to facilitate indigenous production and reduce imports of these minerals to avoid supply chain vulnerabilities, the Cabinet said.
- The Cabinet approved changing of royalty rate calculation mechanism for graphite from per tonne basis to ad valorem basis.
- While graphite is a crucial component in electric vehicle (EV) batteries, zirconium is used in nuclear energy due to its exceptional corrosion resistance. Caesium is mainly used in the high-tech electronic sector, particularly in atomic clocks, GPS systems and rubidium is used in making specialty glasses used in fibre optics, telecommunication systems, and night vision devices.

Do You Know:

- Rare earths are a subset of the critical minerals grouping that includes 17 metallic elements nestled lower down in the periodic table, from lanthanum (atomic number 57) to lutetium (71), as well as plus scandium (21) and yttrium (39).
- These elements are characterised by their high density, high melting point, high conductivity and high thermal conductance. They are classified as heavy or light, based on atomic weight.
- Rare earths form crucial inputs, although often in trace volumes, across a range of products, from weapons platforms and electronics, including flat screen TVs and smartphones, to wind turbines, robotics, electric vehicles, MRI scanners and cancer treatment devices.
- India imported 2,270 tonnes of rare earth elements in 2023-24, up 23% from 1,848 tonnes in 2019-20, according to the Ministry of Mines. Imports from China accounted for 65% of this amount, and another 10% came from Hong Kong. The two sectors that have been badly affected by the Chinese supply curbs in April are the auto industry, especially EV makers, and the electronics sector.

HOUSEHOLD CONSUMPTION RECOVERS, BUT PRIVATE INVESTMENT STILL HOLDS THE KEY

The Indian economy seems to have weathered the impact of US President Donald Trump's tariffs — at least so far. The enabling factors have been GST, the festival season and monsoon. This time, both Dussehra and Diwali came about 10 days earlier compared to last year. The Narendra Modi government timed the Goods and Services Tax rate cuts to take effect from September 22 with the start of the Navratri celebrations. The boost to consumption sentiment from the convergence of the GST rationalisation with the 42-day festival period was reflected in vehicle sales. According to the Federation of Automobile Dealers Associations, retail sales of two-wheelers, passenger vehicles, three-wheelers and commercial vehicles were 21.8, 23.4, 8.9 and 15 per cent respectively higher this year vis-à-vis that for the corresponding 42-day season in 2024. A bountiful monsoon added to the cheer, with tractor sales also posting 14.2 per cent growth.



Simply put, household consumption, which was in slowdown mode for several quarters due to a weak job market, persistent inflation and debt overhang, has staged a recovery of sorts. Annual consumer price inflation falling to a 99-month low of 1.5 per cent in September has definitely helped. There are expectations of improved rural cash flows from a bumper kharif as well as the upcoming rabi harvest, plus the marriage season from November to March, sustaining the current retail momentum. The private consumption revival, if maintained, can potentially offset the drag on growth from the Trump tariffs and global slowdown. The effects of the latter are beginning to be felt, with exports of services falling 5.5 per cent in September 2025 over September 2024. Merchandise exports rose 6.8 per cent, but were 11.9 per cent lower year-on-year to the US. As the tariffs bite and ongoing geopolitical disruptions show no major movement towards resolution, the growth drivers are likely to be more domestic than external. And there, it is private investment that holds the key.

Private corporates aren't investing not because they, or banks, have no money. On the contrary, both corporate and bank balance sheets haven't been as healthy as they are today. They will put up new or expand existing capacities only when they "see" demand and consumers loosening purse strings. And that will happen on a sustained basis only when there are jobs and incomes, setting off a virtuous cycle. The Bihar elections have seen voters flag concerns over berozgari and palayan, primarily about lack of gainful employment opportunities. Economic activity and growth are ultimately about the unleashing of animal spirits of both entrepreneurs and consumers. And that has to manifest well beyond the festival and wedding season.

URGENT UPDATE

The retail inflation data for October once again underscore the fact that the update of the Consumer Price Index (CPI) cannot happen fast enough. The data show that the rate of overall inflation fell to just 0.25%, the lowest it has been since at least January 2012. On the face of it, this would be cause for celebration, but a deeper look reveals this drastic fall to be a statistical anomaly rather than an actual fall in price levels. The food and beverages category saw prices falling 3.7% in October, the largest in the history of the CPI's current series. However, the main reason for this contraction was not so much that food prices have fallen, but because food inflation in October last year was a blistering 9.7%. This high base ensured that food inflation in October 2025 was negative, even though vegetable prices in markets have been on the rise recently. With the food and beverages category enjoying a weightage of nearly 46% in the overall CPI basket, this statistical anomaly in food inflation was responsible for pulling the entire index down. Indeed, inflation in nearly every other major sub-group — fuel and light, housing, tobacco, and the miscellaneous category — was higher this October than last. The impact of the GST rate cuts has, so far, been seen only in the clothing and footwear category — the only one apart from food to see inflation lower than last year. All of this shows just how skewed the inflation measure is. Not only is it outdated, with the base year set as 2012, but the weightages are no longer accurate and more often obscure rather than clarify. The disconnect between the CPI and reality can perhaps best be shown by the fact that people the Reserve Bank of India (RBI) had surveyed in September had said that their perceived inflation rate was 7.4% — a far cry from what the CPI reported.

The urgency behind the update is not just because of the vast gap between measured and perceived inflation. It is also because the RBI's Monetary Policy Committee uses the CPI as its benchmark when deciding what to do with interest rates. Its next meeting is in December and it will have to decide whether to keep rates unchanged or to cut them. It will have to contend with growth data clouded by the temporary impact of the GST rate cut-related demand boost. Having



to also parse through inflation data beset by statistical anomalies will only make accurate policymaking that much harder. The Ministry of Statistics and Programme Implementation has said that the new series of the CPI will be ready by the first quarter of the next financial year. The sooner it happens, the better.

SEBI WARNS AGAINST DIGITAL GOLD: WHAT IS IT AND THE RISKS INVOLVED

The Securities and Exchange Board of India (Sebi) has cautioned the general public against investing in digital gold and e-gold products. While these investment avenues have existed for several years, a steep rise in gold prices, combined with the convenience, and ease of owning gold digitally through online platforms, have led to a surge in their popularity over the last one year.

— The regulator said digital gold products are often promoted as investment alternatives to physical gold. However, they remain unregulated and do not fall under any regulatory ambit, exposing investors to heightened risks.

— Digital gold refers to buying gold without physically possessing the precious metal. The price of digital gold is linked to that of physical gold. Digital gold is created using blockchain technology. It allows investors to buy, sell and store gold electronically.

— Digital gold is easy to access and allows one to sell it quickly in case of an emergency. Unlike traditional gold purchases which require large investments, digital gold or e-gold products allow investors to start owning the precious metal with smaller amounts.

— It also eliminates the storage hassle, which is the biggest challenge associated with physical gold. Digital gold allows investors to convert their investment into physical gold whenever required. It can be converted into coins, bars, or jewellery.

— The markets regulator said it has observed that several digital and online platforms are offering investors the facility to invest in digital gold or e-gold products. These offerings are often marketed as convenient and alternatives to holding physical gold.

Counterparty Risk

Digital gold platforms operate outside regulatory oversight. Risk of default from service providers with no clearing corporation guarantees.

Operational Risk

Platform failures, technical glitches, or business closures can lead to loss of investments with no recourse mechanisms.

No Investor Protection

None of the investor protection mechanisms under securities market purview are available for digital gold investments.

Default Risk

OTC ETF-like structure without regulatory backing makes digital gold vulnerable to provider defaults and business failures.

Unregulated vs Regulated Gold Investments

4TH FLOOR SHATABDI TOWER, SAKCHI, JAMSHEDPUR



Digital Gold

- No regulation
- No demat required
- High counterparty risk
- No protection

Gold ETFs/SGBs

- Sebi regulated
- Clearing corporation backed
- Transparent pricing
- Investor protection

— Sebi said digital gold products are different from gold-related products regulated by it. These products are neither notified as securities nor regulated as commodity derivatives.

— According to the Sebi, digital gold operates entirely outside the regulatory purview. These gold products may entail significant risks for investors and may expose investors to counterparty and operational risks, it said.

— Experts said investors should look at investing in gold products which are regulated by the Sebi to avoid any kind of risk.

— The markets regulator has enabled investments in gold and gold related instruments through various Sebi-regulated gold products such as exchange traded commodity derivative contracts, gold ETFs offered by mutual funds and electronic gold receipts (EGRs) tradeable on stock exchanges.

— Investments in these products can be made through Sebi-registered intermediaries and are governed by the regulatory framework prescribed by the markets regulator.

— Commodity derivatives traded on regulated exchanges such as MCX and NSE are governed by stringent risk management systems, margin frameworks, and daily mark-to-market settlements.

Do You Know:

— Sovereign gold bond (SGBs) are debt securities issued by the Reserve Bank of India (RBI) on behalf of the government, with each unit denoting a gram of gold. These bonds offer the flexibility of trading in the secondary market, providing investors with the opportunity to accrue capital gains.

— The Securities and Exchange Board of India was constituted as a non-statutory body on April 12, 1988 through a resolution of the Government of India. It was established as a statutory body in the year 1992 and the provisions of the Securities and Exchange Board of India Act, 1992 (15 of 1992) came into force on January 30, 1992.



— The commodities traded on commodity exchanges in India can be classified into hard and soft commodities. Hard commodities include metals and energy while soft commodities consist of agriculture and agricultural-processed commodities.

WHAT IS THE ROLE OF A PAY COMMISSION?

The story so far:

The Central government has constituted the 8th Central Pay Commission (CPC) with retired Justice Ranjana Prakash Desai as the Chairperson. It also consists of Professor Pulak Ghosh, faculty at IIM Bangalore, as a part-time member and Pankaj Jain IAS, Secretary to the government of India, as member-secretary. It will submit its report within 18 months.

What is a pay commission?

Pay commissions are set up in India by an executive order based on a Cabinet decision. The role of the CPC is to go into various issues of salary structures, retirement benefits and other service conditions of Central government employees, including defence personnel, and make suitable recommendations on the changes required. The first CPC was set up in 1946.

What are its terms of reference?

The Terms of Reference (TOR) of the pay commissions are finalised by the Union Cabinet. The TOR of the 8th CPC requires it to consider certain factors while making its recommendations. They include economic conditions of the country and the need for fiscal prudence; need to ensure adequate resources for developmental expenditure and welfare measures; unfunded cost of non-contributory pension schemes; impact of recommendations on State government finances that usually adopt the recommendations of the CPC; and the prevailing emolument structure and working conditions available for central public sector undertakings and private sector employees.

What are the international practices?

Globally, till the 1970s, the compensation system for the public sector was aimed at achieving equity by benchmarking them with similar roles in the private employment market. In the 1980s, efficiency replaced equity as the key principle in determining compensation. Starting with the 1990s, performance and incentives became the key principle while balancing them with affordability. At present, public sector compensation systems are evolving to recruit and retain individuals with appropriate competencies and skills, while attempting to contain the total cost to the public exchequer.

As per global standards the key characteristics of fair compensation in the public sector are clear philosophy, ability to attract talent, internal equity, external competitiveness and clarity. In India while internal equity is given adequate weightage, external competitiveness lags behind when it comes to compensation for top positions.

While the general perception in our country is that public sector employment and wages are gargantuan with limited efficiency, it is lesser in almost all parameters when compared to other major democracies.



What next?

There are certain key aspects of the TOR that require attention. First, the TOR requires the CPC to compare the pay structure of the public sector with the private sector. This has been addressed even in earlier pay commissions. Entry level posts in the public sector have significantly higher salaries than their private counterparts while it is the opposite for higher posts and specialist roles. The compression ratio, that is, the ratio of lowest to highest salaries in the Central government has been fixed at 1:12.5 in the seventh CPC. Privileges and perks coupled with job security is a significant intangible that makes up for lower salary packages in top government posts. However, this needs to be revisited with respect to certain top posts and specialist roles in order to attract and retain talent. Second, intangibles like learning and development, training, and work environment including flexible working and health promotion are not part of the TOR. It may be expected that the Commission will address these issues in its final report.

Finally, the 8th CPC has been mandated to consider economic conditions, need to ensure adequate resources for welfare, and unfunded cost of non-contributory pension schemes. The pension bill for the year 2025-26 is estimated at ₹2.76 lakh crore out of the total revenue expenditure of ₹39.44 lakh crore of the central government. The impact of non-contributory pension schemes on the government exchequer needs to be borne in mind while making recommendations. However, welfare measures are political decisions that keep evolving. New schemes are announced by the Centre from time to time. Considering these factors, a commission with members from the judiciary, academia and bureaucracy may not be equipped to assess the impact. There may also be a case for broad basing the commission with finance and human resource professionals to bring in diverse opinions.

AT 72.16%, KERALA STANDS FOURTH IN EMPLOYABILITY RATE

Kerala has reaffirmed its strong position in the country's employability landscape by emerging fourth among the top-performing States in the India Skills Report 2026. The State recorded an employability rate of 72.16% — only Uttar Pradesh, Maharashtra, and Karnataka have better rates.

The State also figures among the top-10 preferred States for women professionals, with the report underlining Kerala's gender-inclusive labour ecosystem.

The report has been published by global education and talent solutions organisation ETS in association with various agencies, including the All-India Council for Technical Education, Confederation of Indian Industry, and the Association of Indian Universities.

Job readiness

Nationally, overall employability has risen to 56.35%, up from 54.81% last year, with more than half of India's graduates scoring above 60% in the Global Employability Test (GET) conducted to compile the report. Kerala figures prominently in both State and city-level rankings, reflecting a consistent rise in job readiness and sector-specific skill alignment.

Among the top performing cities, Kochi ranks fourth, ahead of major metros such as Delhi and Hyderabad, with an average employability score of 76.56%. The report identifies Tier-2 cities such as Kochi and Lucknow to be emerging as strong talent hubs, narrowing the urban-rural skill gap.



Women's employability in the country has seen a remarkable rise to 54%, surpassing men (51.5%) for the first time. Kerala, along with Uttar Pradesh and Telangana, leads this shift by reporting strong female participation in banking, financial services and insurance sector (BFSI), health care and education sectors.

GOVT REVOKES 14 QCOS ON INTERMEDIATE GOODS AFFECTING TEXTILE VALUE CHAIN, INDUSTRY EXPECTS MORE ROLLBACKS

The Ministry of Chemicals and Fertilisers on Monday revoked quality control orders (QCOs) on 14 items consisting of chemical intermediates, synthetic fibres and polymer resins that play a key role in the textile manufacturing value chain, as the sector has come under stress due to cancellation of US-bound export orders in the backdrop of steep 50 per cent US tariffs.

— The QCOs that have been rolled back include primary input materials such as Terephthalic Acid, Ethylene Glycol, and intermediates such as Polyester Industrial Yarn (IDY), Polyester Staple Fibres (PSF), where India has significant import dependency.

— The rollback of QCOs comes after an internal Niti Aayog report pointed out that the mandatory enforcement of standards on intermediaries and raw materials instead of finished goods has contributed to “operational complexities” for the industry.

— Industry representatives said that they expect other ministries to also soon revoke quality standards, such as those on viscose fibre and machinery used in the textile manufacturing units, soon.

— The Confederation of Indian Textile Industry (CITI) said that the imposition of a 50 per cent US tariff on Indian goods, effective August 27, had taken a heavy toll on India's textile and apparel exports in September. The US is the single largest market for India's textile and apparel exports, contributing almost 28 per cent to the total revenue of India's textile and apparel exporters.

— Although India has significant installed capacity in polyester, supply gaps persist in specialised grades and blends required for export markets. In viscose, production is concentrated among a handful of firms, creating dependence on limited players, the report said, adding that the resulting shortages and higher prices have forced several downstream units to operate below capacity.

— Niti Aayog said that over the past decade, India's quality regulatory framework has evolved significantly with the expansion of QCOs issued under the Bureau of Indian Standards (BIS) framework and while QCOs are introduced to enhance consumer safety and promote high-quality manufacturing, their scope has extended beyond finished goods to encompass raw materials, intermediates, and capital goods that are critical for downstream industries.

— Between 2016 and 2025, the number of products brought under mandatory QCO coverage has grown from less than 70 to nearly 790 products, including one Omnibus Technical Requirement (OTR) that covers 20 products, the Niti Aayog report said.

Do You Know:

— In India, BIS formulates Indian Standards for different products. While the BIS certification scheme is voluntary in nature, for a number of products, compliance to Indian Standards is made compulsory by the Central Government under various considerations viz. public interest,



protection of human, animal or plant health, safety of environment, prevention of unfair trade practices and national security.

— The Bureau of Indian Standards (BIS) Act, 2016, empowers the government to mandate standardisation through compulsory certification.

— The aim of QCOs is to uplift the national quality ecosystem and curb substandard cheap imports of goods in the country, said the sources.

E-COM SITES MAY HAVE TO DISCLOSE COUNTRY OF ORIGIN OF GOODS SOLD

A set of draft rules released on Monday by the Union Department of Consumer Affairs has proposed to make it mandatory for e-commerce platforms to provide 'searchable and sortable filters' based on the 'country of origin' for packaged commodities sold online.

"This will enhance consumer empowerment and transparency in online shopping," the government said in a release.

The Draft Legal Metrology (Packaged Commodities) (Second) Amendment Rules, 2025, proposes to add in rule 6, in sub-rule (10) of the existing rules that: "Provided that every e-commerce entity selling imported products shall provide a searchable and sortable filter for the country of origin, with their product listings."

The release added that the amendment seeks to empower consumers to make informed purchasing decisions by allowing them to easily identify the origin of products while shopping online. "The proposed feature will enable consumers to search and sort products by their country of origin, thereby enhancing transparency and reducing the time required to locate such information across vast product listings," it said.

Stakeholders can submit their observations and comment on the draft rules to the government till November 22, 2025. "The amendment directly supports the 'Atmanirbhar Bharat' and 'Vocal for Local' initiatives by making 'Made in India' products easily discoverable," the Centre added.

DreamIAS



LIFE AND SCIENCE

WHY DO ASTRONAUTS WEAR PRESSURISED SUITS?

Why is it mandatory to wear IVA suits during ascent and descent of the spacecraft?

Space is the vast area beyond the earth's atmosphere, filled with stars, planets, and galaxies. In this airless environment, one of the most critical differences from life here is the absence of atmospheric pressure.

Why is pressure important?

The atmosphere is a thick layer of gases held around the earth by its gravity. It protects us from harmful solar radiation, keeps temperatures stable, and provides gases to respire. The atmospheric pressure presses down on our bodies with about 20 tonnes of force, but we don't feel it because our bodies have evolved to push back with equal force, balancing it out. As we go higher, the atmosphere gets thinner and its pressure drops.

When a human body is suddenly exposed to vacuum, a sequence of sudden lethal effects occur, including ebullism (boiling of bodily fluids at low pressure), decompression (rapid loss of atmospheric pressure in a spacecraft), and lack of oxygen (hypoxia). The absence of atmospheric pressure causes gases to expand rapidly in the lungs and tissues, leading to loss of consciousness in seconds and death in a few minutes.

How are astronauts protected?

Astronauts wear special suits during space travel for their safety. Extra-vehicular activity (EVA) suits or spacesuits are for walks and work outside the spacecraft, like fixing external components and conducting maintenance. They have 12-14 layers and serve as a personal spacecraft, protecting its wearer against the vacuum of space, extreme temperatures, radiation, and space debris. Each EVA suit weighs 100-130 kg. Likewise, intra-vehicular activity (IVA) suits are worn inside the spacecraft and include a flight suit and a pressure suit. A flight suit is a general-purpose garment worn by pilots and astronauts, primarily for fire resistance, and protection against environmental conditions like temperature extremes or low pressure at high altitudes. A pressure suit is a specialised garment designed to protect against the extremely low pressure environment of high altitudes or space. It provides full-body pressurisation, oxygen supply, and thermal regulation, making it more robust than a standard flight suit. The pressure suit weighs about 8-10 kg and has two or three major layers, depending on the model.

In 1961, Yuri Gagarin, the first human to go to space, wore a specialised IVA suit called SK-1. The U.S. and Russia have developed eight to 10 IVA suit designs.

Is wearing an IVA suit mandatory?

In the tragic Soyuz 11 mission in 1971, three cosmonauts died when returning to the earth. When the crew's descent module separated from the orbiting module, a vent valve meant to balance cabin pressure opened too early at about 168 km altitude. It didn't close properly, causing the air to rush out quickly, suffocating the cosmonauts. The disaster led to major safety changes in the Soviet space program, including bringing in a mandate to wear IVA suits during ascent and descent. These phases are dynamic and under exigency may involve high G-forces, sudden loss of cabin pressure, extreme heat, and vibrations, all of which pose serious risks.



Which IVA suit does Gaganyaan use?

In Gaganyaan, India's first human spaceflight mission, the 'gaganyatris' will be using the Russian Sokol KV2 suit manufactured by Zvezda. The suit consists of two layers: an inner pressure bladder made of rubberised polycaprolactam to remain airtight, and an outer restraint layer of white nylon canvas for structural support and protection. Many astronauts have worn the Sokol suit and it has been involved in more than 128 Soyuz crewed missions. While the Sokol suit provides vital assurance, it also underscores a key phase in India's space journey: leveraging global expertise while pursuing the goal of indigenous human spaceflight capability.

WHAT'S THE STATUS OF THE RARE EARTH HYPOTHESIS?

The rare earth hypothesis was proposed in a 2000 book by palaeontologist Peter Ward and astronomer Donald Brownlee. It argues that while simple, microbial life may be common in the universe, complex, multicellular life is likely uncommon. The idea is rooted in a particular place in the universe meeting a chain of successive conditions.

While we often talk about life as ranging from simple (e.g. bacteria and yeast) to complex (e.g. humans and octopuses), life itself is a complex phenomenon and the product of many factors falling in place. Studying these factors on the earth itself has been an arduous and even now an unfinished task; and looking for them on planets located several light years away remains extraordinarily fraught. Scientists studying the possibility of life on other planets have busied themselves with particular aspects over time. Some focus on planetary ingredients such as a rocky world with surface water in the habitable zone of the host star. Other scientists have been concerned with system-level architectures such as giant planets in particular places in the universe. Still others have been looking into long-term climate regulation and a persistent atmosphere. And so on.

Since 2000, we have accumulated significantly more data about exoplanets and planetary science. And the big picture that has emerged is mixed: several conditions required for life look less restrictive than scientists once feared whereas many others look harder to meet than scientists had hoped.

Understanding a planet

Let's consider how often potentially habitable earth-sized planets occur. Studies based on early data from the NASA Kepler telescope (2009-2018) suggested that a significant fraction of sun-like stars in the Milky Way galaxy hosts small planets receiving starlight comparable to what the earth receives. One study even found that roughly a fifth of sun-like stars may harbour earth-sized planets in their habitable zones, although the data had many uncertainties.

More recent work has concluded, based on Kepler data, that there's a non-negligible rate at which rocky planets occur in the habitable zones of stars called GK dwarfs. These and similar findings have concluded that worlds of roughly the right size at roughly the right distance from a suitable star are not rare, thus weakening the most sweeping claim in the hypothesis. The question has thus shifted from 'where a planet is' to 'what a planet is like'. In the solar system, Mercury is too close to the sun to host earth-like life whereas Pluto is too far away. But while both the earth and Venus are in the sun's habitable zone, Venus's atmosphere renders it deadly for earth-like life.

One important open issue is whether small planets around cool, active M-dwarf stars can retain their atmospheres and surface water over billions of years. Modelling studies have indicated that



planets that spend millions of years exposed to intense stellar radiation — like that M-dwarf stars are known to emit — tend to lose water and build up false-positive oxygen atmospheres.

Say intense ultraviolet radiation from an M-dwarf star breaks up water molecules on the planet: $H_2O \rightarrow H+ + OH-$. Further breakdown leads to O and H atoms accumulating in the atmosphere. Over time, the H escapes to space more easily than O, and the O atoms left behind pair up to form O₂. If there aren't enough surface 'sinks' that can absorb this oxygen fast enough — the way rocks and oceans do on the earth — the O₂ will accumulate. When a telescope looks at this planet and finds an excess of oxygen in its atmosphere, scientists may think the planet's surface has photosynthesis, which is how the earth's atmosphere has lots of oxygen. But it's actually due to the M-dwarf star's radiation.

On the other hand, some planets around M-dwarf stars can keep their air for a long time, even if most can't. If the star's magnetic outflows — streams of charged particles blown off the star by its magnetic field — are weak or shaped in such a way that they don't hit the planet hard, and if the planet is farther out and cooler, its atmosphere will be eroded more slowly. A strong planetary magnetic field can also deflect a part of the stellar wind, while a massive planet with ongoing volcanic activity can replace some of the lost gases.

These are all system-specific conditions that require a specific mix of star activity, magnetic fields, orbit, planet mass, rotation, and internal heat. When they line up well, a planet can retain its atmosphere for billions of years. However, such planets are in the minority because M-dwarf stars often produce strong flares and many close-in planets lack strong magnetic shields.

Scientists can directly test these observations today. Using NASA's James Webb Space Telescope (JWST), astronomers have started measuring the heat emitted from nearby rocky exoplanets. In TRAPPIST-1c, which is located near the inner edge of its system's habitable zone 40.7 lightyears away, the JWST has ruled out a thick atmosphere rich in carbon dioxide. Previously, scientists using JWST data had also found that the innermost planet, TRAPPIST-1b, likely lacked a substantial atmosphere.

These are only two worlds in one system, yet they show that earth-sized isn't synonymous with earth-like. Scientists still need more measurements of cooler, more temperate planets to understand how often atmospheres survive where earth-like life could plausibly persist.

Climate stabilisation

Another pillar of the rare earth hypothesis is long-term climate stabilisation. On the earth, the weathering of continental rocks and the recycling of carbon between the earth's interior and the atmosphere have buffered the climate over geologic time. Many researchers have linked this buffering to plate tectonics, which subduct a carbonated crust and build new surface rocks. This said, the interiors of planets behave in different ways. Rocky planets can have one stiff shell that barely moves, long quiet times broken by short bursts of crust movement or plate-like tectonics (as on the earth). A planet can even switch between these modes over time. Some models also show that without modern plate tectonics, a planet might still keep a habitable climate by balancing volcanism (which adds gases), weathering (removes gases), burial (traps materials), and crustal foundering (sinks the crust). Scientists don't have consensus either: while plate tectonics could help maintain a stable climate that in turn can support complex life, it may not be strictly required for life to begin.



The role of giants

A third line of debate is the role of giant planets like Jupiter. The old intuition was that Jupiter 'shields' the earth by deflecting comets and asteroids. Subsequent studies have complicated this story, however. Depending on a giant planet's mass and orbit, scientists have found that it can reduce or increase the flux of impactors to the inner system and it can also deliver water-rich bodies early on. In other words, there seems to be no universal 'filter' on this front; it all depends on the system's architecture. This conclusion has weakened the claim that a Jupiter-like planet is a necessary precondition for complex life on a rocky planet in the same system.

Thus, on the question of finding small, temperate planets, many scientists today argue that the occurrence rate of earth-sized planets in the habitable zones of sun-like stars is non-zero and may be a few tens of percent, per Kepler data, depending on the definitions and extrapolations. That undermines the notion that the earth's basic orbital and size configuration is vanishingly uncommon. On the other hand, on the question of planets' ability to retain atmospheres, have long climate cycles, be able to avoid catastrophic events, and so on, the data has become more sobering. The results keep open the possibility that truly earth-like surface environments supporting complex biospheres are less common than the count of earth-sized planets in the habitable zone would suggest.

Not definitive

Two more threads bear on the rare versus common debate. First, a recent effort to place an upper limit on the number of earth-like planets emphasised that a lot hinges on atmospheric processes that scientists can't yet survey at scale. Second, searches for technosignatures — signs of technology made by extra-terrestrial life, especially things nature is unlikely to produce on its own — have sharpened the limits on the prevalence of civilisations whose activities emit radio waves (such 'radio-loud' activities on the earth include broadcasting for TV and radio and air traffic control). Multi-year surveys of thousands of stars by the Breakthrough Listen project haven't found any convincing signals so far. While not detecting something doesn't prove that it's absent, it sets upper limits on how common it could be in the cosmos.

Taken together, the rare earth hypothesis remains plausible for complex life but it can't be said to be demonstrably true. At this juncture, three developments could change the picture: (i) if scientists detect atmospheres on rocky, temperate planets, preferably around sun-like stars, showing gases consistent with active surface water cycles; (ii) if scientists place stronger better constraints on tectonic regimes on exoplanets (even indirectly), indicating whether long-term climate stabilisers are widespread or rare; and (iii) scientists detect biosignatures or technosignatures. The first steps are already underway. Extremely large ground telescopes currently under construction as well as future space missions are aimed squarely at planets with temperate atmospheres.

Until their observations mature, however, a fair summary seems to be: while microbial life could be common, long-lived ecosystems straddling land and ocean and capable of producing complex life may still be scarce. This seems to be as far as the data can take us today.

ARTIFICIAL INTELLIGENCE CANNOT LIVE OFF FREE ART FOREVER

Australia isn't known for building world-leading artificial intelligence systems. But the island nation might just become the moral compass for how the rest of the democratic world approaches



them. Last week, Australia took a stand on what may become the defining issue of the AI age: how machines learn, and at whose expense.

The story begins with a think tank most people barely know: Australia's Productivity Commission. In August, it released a dense report titled 'Harnessing Data and Digital Technology'. Buried in it was a radical idea to give AI companies a free pass to mine copyrighted content.

The commission called it a "text and data mining exception," which simply means that books, journalism, songs, and art could be scraped to train AI models without asking permission or paying for it.

The commission's reasoning sounded pragmatic: AI needs tomes of data to improve, and removing copyright barriers was aimed at helping the island nation catch up in the global tech race. But that logic misses a moral and an economic truth that AI can't live off free art forever.

Every dataset that powers machine intelligence is built on human creativity. To treat that work as free fuel is to erode the very culture that makes intelligence, artificial or otherwise, worth having.

Predictably, the reaction was fierce. Authors, artists, and news organisations accused the government of handing their life's work to Big Tech for nothing. The outrage reached Canberra, and Attorney General Michelle Rowland drew a line in the sand. "Australian creatives are not only world-class — they are the lifeblood of Australian culture," she said. "Technology's advance must not come at their expense." With that, the government scrapped the proposal and set up the Copyright and AI Reference Group (CAIRG), tasked with designing new licensing models to ensure creators are paid when their work trains AI. A technical tweak on paper, but a seismic shift on the ground.

Australia has become the first major democracy to say, unequivocally, that human creativity is not public property just because it's online. It's a stance that will reverberate far beyond its borders. World democracies must take a stance on how AI companies can train their models using "text and data" from copyrighted material.

If AI systems depend on human-generated content, who controls that input, and how are the profits shared between parties?

Data is critical to AI, and restricting access can slow innovation. And today's AI models have already consumed most of the internet's text, art, and music. What's left are the works of art and literature that are yet to be produced. It is high time that governments around the world wake up and put up a working mechanism in place where human creativity is fairly compensated by AI companies that unethically scrape the web to train their AI models.

By rejecting unrestricted scraping, Australia forces AI companies to grow up. If they want high-quality, up-to-date data, they'll have to negotiate, license, and pay. That's not a roadblock, but the next stage of evolution: a shift from extraction to cooperation. The AI industry stands at a crossroads. It can keep hoovering up culture in a legal grey zone, inviting lawsuits and public distrust, or it can build something sustainable through an ecosystem where innovation is built on consent and compensation.

Australia's move offers a blueprint for other democracies to follow. It shows that protecting creators isn't anti-innovation. It's how innovation earns legitimacy. Ultimately, the future of AI depends on not just processing power, but human creative input that enables machines to learn. And no matter how clever the machines get, they can't live off free art forever.



'HUMAN BIOMASS MOVEMENT EXCEEDS ALL LAND ANIMALS COMBINED'

A medium-sized, grey bird that weighs just 100 g travels from pole to pole each year, covering 90,000 km back and forth. Thus, the Arctic tern undertakes the longest journey of any of the planet's wild animals. Every year, two million of these birds travel from the Arctic to Antarctica. But being so light, their total biomass is only 0.016 gigatonnes (Gt) per km per year.

The biomass movement of a species is its total biomass times the distance it actively travels. For instance, African elephants, which migrate miles in search of new territory or food, travel about 7 Gt/km/yr.

This is "similar to the biomass movement associated with international human gatherings such as ... the FIFA World Cup," a paper published recently in *Nature Ecology & Evolution* said. This study has now reported that the biomass movement of humans is 4,000 Gt/km/yr, "over 40-times greater than our best estimate for all wild land mammals, arthropods, and birds combined, and over six-times greater than the upper estimate for the biomass movement of all land animals combined."

"As animals and humans move, they shape ecosystems in myriad ways, from transporting nutrients and organisms to trophic effects and physical ecosystem engineering," according to the paper. "It exemplifies how our species is a planetary scale force that is stronger than other species," Ron Milo, a co-author of the paper and a professor at the Weizmann Institute of Science, Israel, told *The Hindu*. "This can help people understand how we are indeed also affecting our climate. It also shows we have the power and responsibility to take care of the terrestrial and oceanic environment."

Humans move longer average distances of around 30 km per day, the study estimated, most of it using "motorised vehicles, with ~65% in cars and motorcycles, ~10% in airplanes and ~5% in trains and subways. Two-thirds of all motorised mobility occurs in high-income and upper-middle-income countries."

Even as humans' movement has exploded, that of marine animals, which the study estimated to be "the living world's largest," has halved since 1850 thanks to industrial fishing and whaling in the Anthropocene epoch.

Curiously, the biomass movement of domesticated animals was found to be of the same order of magnitude as humans and the locomotion of non-dairy cattle corresponds to most of this biomass movement, the authors added.

HOW JAMES WATSON HELPED UNRAVEL THE DOUBLE HELIX

Few biologists have acquired the kind of celebrity status that James Watson and Francis Crick did. Their discovery of the double helical structure of the DNA molecule in 1953 is considered one of the biggest breakthroughs in Science, which not only enhanced understanding of how life replicates itself, but also profoundly impacted fields ranging from health to agriculture. So much so that the figure of the twisted ladder structure of the DNA has become a shorthand to represent Science itself. Last week, Watson died at 97.

— Born in the US, Watson was less than 25 years old when he partnered with Crick to unveil the structure of the DNA (deoxyribonucleic acid). The Nobel Prize-winning discovery revealed how individual traits are passed on from one generation to another, and is often placed alongside the

4TH FLOOR SHATABDI TOWER, SAKCHI, JAMSHEDPUR



development of quantum theory and the theory of gravitation as the greatest scientific accomplishments of the 20th century.

— DNA is a large molecule containing the genetic information of an individual. This information, encoded in the genes, determines all the individual characteristics of the organism — from physical appearance to internal biology. During reproduction, these genes are replicated and transmitted to the offspring, sometimes with small changes that lead to genetic diversity and drive evolution.

— The chemical existence of DNA was discovered in 1869 by the Swiss chemist Friedrich Miescher. Decades later, it was learnt that chromosomes, made of DNA and some proteins, were associated with inheritance.

— By the 1940s, scientists figured out that it was DNA, and not the proteins inside the chromosomes that carried genetic information. But scientists still did not know how DNA was able to store genetic information or how it was passed on. Thus, its structure had to be deciphered.

— In 1952, Watson and Crick experimented with three-dimensional wooden models to fit into a structure that matched the information provided by other scientists. Clues came through chemical analysis and images obtained from X-ray crystallography methods. Under British chemist Rosalind Franklin's supervision, her student Raymond Gosling took a historic X-ray photograph (called Photo 51), which showed the double-helix structure of DNA. Watson and Crick saw this photo and some of her unpublished data, which served as the basis of their DNA model.

— The final Watson-Crick wooden model had two long strands, each with a series of four nitrogen-containing compounds — Adenine (A), Thymine (T), Cytosine (C) and Guanine (G) — held in a chain by some sugar and phosphate compounds.

— The Adenine on one strand is always opposite the Thymine on the other, while the Cytosine is paired opposite Guanine. The two parallel strands were shaped in a twisted ladder of sorts, to account for stability, compactness and other features revealed in earlier experiments.

— The discovery of the DNA structure sparked a flurry of new research, birthing fields like molecular biology, biotechnology, gene modification and editing.

WAICO: THE WORLD ANTI-ILLICIT COOPERATION ORGANISATION

The first World Anti-Illicit Cooperation Organisation (WAICO) conference convened to enhance global collaboration in combating illicit trade in goods and services. The event included senior representatives from customs authorities and enforcement agencies globally. India highlighted its efforts to curb illicit trading under schemes like Operation Sesha.

— WAICO's primary aim is to facilitate cooperation among member states to fight against all forms of illicit trade, including counterfeit products, smuggling, and tax evasion. India, a founding member, emphasized the impact of illicit trade on legitimate businesses, consumers, and government revenue.

— WAICO will function as a platform for sharing best practices, intelligence, and developing joint enforcement strategies.

— The organization will also focus on skills-building and capacity enhancement for member law enforcement agencies.



— The conference outcome included a declaration to strengthen legal frameworks and cross-border cooperation among participating nations.

Do You Know:

— According to the World Economic Forum, illicit trade is among the fastest growing global risks, impacting sectors such as tobacco, pharmaceuticals, luxury goods, and the environment.

— Operation Sesha is an Indian initiative targeting organized smuggling syndicates and the illegal trade of tobacco products and narcotics, with significant success in recent years.

PATTERNS IN THE SKY

Why do clouds have different shapes?

Cloud shapes arise from how air moves and mixes at different heights. When air rises, it cools. If it cools to its dew point, water vapour condenses into droplets or ice, forming a cloud.

If the rising is gentle and spread out, such as when warm air slides over cooler air, flat and layered stratus clouds form. If the rising is strong and localised, e.g., when wind pushes air up a hill, the result is the puffy cumulus cloud. If the same process happens harder and at higher altitudes, towering cumulonimbus clouds take shape.

The atmosphere's stability controls vertical growth. In stable air, a lifted parcel tends to sink back down, but in unstable air, a lifted parcel keeps rising and so clouds build upward. Wind shear can stretch or flatten clouds. Steady, smooth winds over mountains can form smooth lenticular lenses. Layers of air sliding over each other can create wavy Kelvin-Helmholtz curls.

High humidity favours thicker, darker clouds and drier air frays the edges. Small droplets make smooth, milky layers. Mixed droplets and ice create more structure.

ALL PLASTICS ARE NOT THE SAME

Q. Why can we recycle only some kinds of plastics?

A: 'Plastics' is an umbrella term for various materials with some similar properties. Each type of plastic has a different polymer structure and set of additives. These differences decide how a piece of plastic behaves when it is heated, ground down, and remade, which is why only some kinds can be recycled in practice.

Thermoplastics like the PET in water bottles and HDPE in milk jugs soften when heated and harden when cooled. This property allows them to be melted, filtered, and reshaped with limited damage, so they are widely collected. Thermosets like the many epoxy resins and some rubber parts form permanent chemical bonds when they're first made. They crack rather than melt when heated, so they can't be recycled by normal heat-based methods. Even among thermoplastics, recycling depends on purity. Labels, food residues, dyes, fillers, flame retardants, and plasticisers change how the melt flows and weakens the final product. Multilayer packaging combines different polymers (for example, PET, polyethylene, and aluminium) to keep food fresh, but these layers are hard to separate, so the item is often not recyclable.

Collecting, sorting, washing, and remelting also cost money, so recycling happens only when there is a steady demand for the recycled pellets. Bottles and jugs have large and cleaner waste streams



and established buyers whereas many films, foams, and mixed plastics don't. Newer chemical recycling methods can in principle break polymers to simpler molecules, but they are energy-intensive and not yet broadly deployed.

WHAT'S THE LATEST IN CLIMATE SCIENCE?

With the pace of climate change speeding up, extreme weather and other impacts are taking an increasing toll on populations and environments across the globe. Here are some of the developments this year.

Warmer, faster: Global temperatures are not just climbing, they are now climbing faster than before, with new records logged for 2023 and 2024, and at points in 2025. That finding was part of a study in June that updated baseline data used in the science reports done every few years by the UN Intergovernmental Panel on Climate Change. The new research shows the average global temperature rising at a rate of 0.27 C each decade, almost 50% faster than in the 1990s and 2000s when the warming rate was around 0.2 C per decade.

Sea levels are rising faster, at about 4.5 mm/year over the last decade compared to 1.85 mm/year measured across the decades since 1900. The world is now on track to cross the 1.5 C warming threshold around 2030, after which scientists have warned we will likely trigger irreversible consequences. Already, the world has warmed by 1.3-1.4 C since the pre-industrial era, according to the World Meteorological Organisation.

Tipping points: Warm-water corals are in an almost irreversible die-off from successive marine heatwaves, marking what would be the first so-called climate tipping point, when an environmental system begins to shift into a different state. Researchers in October also warned that the Amazon rainforest could begin to "die back" and transform into a different ecosystem, such as savannah, if rapid deforestation continues as global warming crosses 1.5 C.

They also said meltwater from the thawing ice sheet atop Greenland could help cause an earlier collapse in the ocean current called the Atlantic Meridional Overturning Circulation, which keeps winters mild in Europe. In Antarctica, where ice sheets are also under threat, scientists are worried about declining sea ice surrounding the southernmost continent. Similar to what is happening in the Arctic, ice loss exposes dark water that can absorb more solar radiation, which amplifies the overall warming trend. It also jeopardises the growth of phytoplankton that consume much of the world's CO₂.

Along with heatwaves and drought, wildfires still threaten to be frequent and severe. This year's State of Wildfires report, led by a group of weather agencies and universities, counted some 3.7 million sq. km as having burned between March 2024 and February 2025, an area about the size of India and Norway combined.

That was slightly less than the annual average burned for the last two decades. But the fires produced higher CO₂ emissions than before.

Deadly heat: Researchers are working on ways to assess heat-related health risks and tolls, as U.N. health and weather agencies estimate about half the world's population is already struggling. The agencies also estimate worker productivity dropping 2-3% for every degree above 20 C, while another study in The Lancet in October estimated global losses of more than \$1 trillion from that lost productivity for last year alone.



GLOBAL CARBON PROJECT UNDERLINES NEED FOR INVESTMENTS IN CLEAN ENERGY, BUILDING PEOPLE'S RESILIENCE

Global carbon emissions are estimated to touch a record high by the end of 2025, according to a study whose release was timed to coincide with the COP 30 underway in Brazil. The US registered the greatest increase over 2024 at 1.9 per cent, followed by India at 1.4 per cent and China and the EU at 0.4 per cent. However, the report, produced by a team of 130 scientists working with the Global Carbon Project, points out that emissions from India and China increased much more slowly compared to 2024, largely because of the large-scale deployment of renewable energy. A relatively cooler summer and an early monsoon also meant that India's electricity-sector emissions in the first half of this year declined compared to the same period in 2024. The slowdown should also be seen as a part of a longer trend of reduction in the carbon intensity of the country's economy — the average growth of GHG emissions came down to 3.6 per cent in 2015-2024 from 6.4 per cent in 2004-2015. In contrast, the US figures indicate a reversal of a nearly two-decade-long downward trend in the country's emissions.

Beyond providing a report card of the emissions trajectory of the major economies, the Global Carbon Project has a sobering message — the decarbonisation drive is not strong enough to mitigate the dangerous impacts of global warming. Renewables have edged out coal as the major source of electricity. Even then, the increasing appetite for energy means there's no let-up in fossil-fuel deployment. Global emissions might well flatten and then decline by about 2030. But that will not be enough to keep the temperature rise to the Paris Climate Pact's target of 1.5 degrees. The new report warns that at the current emission rate, the world will be perilously close to exhausting the carbon budget for the Paris Pact's threshold. As another report — also released to coincide with COP 30 — underlines, the world is on track for a 2.6-degree temperature rise.

The message should not be lost on the negotiators who have assembled in Brazil. COP 30 needs to provide a roadmap for the use of clean energy. At the same time, it's also time that more investments are made in securing lives and livelihoods against floods, droughts, cyclones, the ravages of global warming.

INDIA RECORDED THE HIGHEST GREENHOUSE GAS EMISSIONS FOR 2024

In 2024, India registered the largest absolute increase in greenhouse gas (GHG) emissions among all countries compared to the previous year. India was the third largest overall emitter of GHGs in 2024, behind only China and the United States, in absolute terms. However, its per capita GHG emissions remained less than half the global average, highlighting the country's relatively low emissions intensity despite rapid absolute growth.

Worldwide, GHG emissions are on an increasing trend. In 2024, 57,700 metric tonnes of CO₂ (MtCO₂e) of anthropogenic GHG was emitted, the highest on record.

Fossil CO₂ emissions from burning coal, oil, and natural gas accounted for 69% of GHG emissions in 2024. Emissions from power generation were the largest single source for fossil CO₂. This was followed by emissions from industrial combustion, transportation, and fuel production. Anthropogenic CH₄ (methane) emissions — emitted majorly during agricultural and waste management procedures — accounted for 16% of GHG emissions, the second largest share. Deforestation and land-use change also amounted significantly to this year's rise in emissions.



In 2024, India's per capita GHG emissions was 3 tCO₂e, less than half of the global average of 6.4 tCO₂e. However, India's per capita GHG emissions grew at 3.7% between 2023 and 2024, much higher than the global average of 0.04% increase.

The 57,700 MtCO₂e worth of GHG emitted globally in 2024 was 1,500 MtCO₂e higher than 2023. India contributed 165 MtCO₂e to this rise, the highest among all nations. China stood second, contributing 126 MtCO₂e.

NEW HORIZONS

The 30th edition of the Conference of Parties (COP) has begun in Brazil's Belém. Coming 10 years after the historic Paris Agreement, when all signatory members of the United Nations Framework Convention on Climate Change (UNFCCC) committed to a common goal of keeping temperatures below 2°C and "as far as possible below 1.5°C", this would have been an ideal platform to take stock of the achievements so far and ramp up ambition. Instead, there is a visible sense of disarray. The United States has, yet again, withdrawn from the Paris Agreement (though not the UNFCCC) and from 2017, this break seems decisively more hostile. Wielding threats on tariffs and brinkmanship, the U.S. Administration seems actively committed to derail steps toward emission cuts, newer ways to fund adaptation and adopting clean technology. For instance, it has played a major role in recent months in scuttling a resolution by members of the International Maritime Organization (IMO) into transitioning the shipping industry away from fossil fuel use. Following Bill Gates's shift from being a vocal advocate of curbing emissions to one who no longer sees climate change as an existential threat, Mr. Trump announced it as a "vindication" of his position. There is a case that the U.S.'s isolationist policy is of diminishing relevance in an era when global investments in clean energy outpace fossil fuel investment and that businesses globally have seen the writing on the wall. But as the IMO example states, the U.S.'s abilities as a destabilising force remain formidable. That must be at the back of negotiators' minds when they began the 12-day deliberative sprint.

This COP is one of 'implementation', as the Brazil Presidency has emphasised. While the world's collective action is far short of what the Paris goals require, there is palpable optimism that the tenor of discussions from now on will visibly shift toward ironing out financial mechanisms for adaptation, preserving forests and strengthening carbon credit markets. It is likely that there will be a renewed discussion on how to make the United Nations' multilateral process more effective at delivering decisive outcomes and, perhaps, a debate on the creation of a 'climate council', as Brazil proposed earlier this year. All of this promises fresh energy and verve to a process that has come to be seen as ineffective in addressing the climate crisis. However, this is also an opportunity for the large developing economies — India, China, Brazil, and South Africa in particular — to stake claim to leadership. This might require a greater display of ambition and recalibration of past positions, particularly on financial contributions. Sans fireworks, India must begin an internal dialogue to place itself favourably for this nebulous future.

COP30: BEGINNER'S GUIDE ON WHAT TO EXPECT FROM THE CLIMATE SUMMIT

A decade has passed since the member countries of the United Nations Framework Convention on Climate Change (UNFCCC) adopted the Paris Agreement — a milestone global pact that committed them to keeping the world's average surface temperature from rising well under 2°C and striving to limit it to 1.5°C above pre-industrial levels.



However, climate finance has lagged, global emissions continue to rise, and the gap between pledges and practice has only widened since.

Against the backdrop of record-breaking heat, intensifying climate impacts, and mounting public frustration with global inaction, the 30th Conference of the Parties (COP30) to the UNFCCC begins in Belém, Brazil, today.

It is both symbolic and strategic that COP30 is being hosted in Belém, which is a point of entry to the Amazon rainforest. The Amazon is one of the world's largest and most important carbon sinks (estimated at 150-200 billion tonnes) and biodiversity reserves on the planet — and it is threatened by deforestation and land conversion to non-forest use. As a result, it is tipping towards irreversible decline.

Equity and inclusion are central to climate negotiations. But paradoxically, even before the negotiations began, COP30 faced an unexpected test: inclusion. This is because Belém has limited logistical options, leaving hotel room rates to skyrocket and rendering it difficult for representatives from low-income nations and civil society organisations to participate. Such logistical exclusions have, in some ways, undercut the moral weight of the process.

'Implementation COP'

For starters, COP30 is being called the 'Implementation COP' because it is expected to be a watershed event where commitments are expected to be translated into concrete action. Guided by the Global Stocktake (GST) — which is a mandatory review that countries have to undertake every five years to assess their progress on addressing climate change, identify gaps, and draft plans — COP30 is expected to advance mitigation, adaptation, and means of implementation.

Its programme will thus focus on six key areas, including energy, industry, and transport transitions; stewardship of forests, oceans, and biodiversity; transformation of food systems; resilience in cities, infrastructure, and water; and human and social development.

The Baku-to-Belém Roadmap on Climate Finance is a plan led by the COP presidency, developed by Azerbaijan and Brazil under the UNFCCC's guidance, to show how countries and institutions could scale finance for developing nations to at least \$1.3 trillion a year by 2035.

It's less a binding pledge and more a menu of actions to inform negotiations after the \$300-billion New Collective Quantified Goal (NCQG) decision at COP29. Now, as the first major stocktake after the Roadmap, participants are looking at COP30 to set a new collective goal for 2035. In addition to revisiting emission reduction and climate finance goals, it's also expected to reaffirm the fact that protecting forests and indigenous communities is central to global climate resilience.

Ultimately, COP30 will seek to mobilise all actors to accelerate climate action.

Adaptation in negotiations

Climate adaptation is imperative for the survival of millions of people in the Global South. But because adaptation is context-specific, what works in a coastal delta is unlikely to work in a mountain village. As a result, negotiations surrounding the Global Goal on Adaptation (GGA) have been difficult. The GGA aims to establish quantifiable goals and metrics for resilience, organise funding that matches the need, and create a system for accounting and quantifying adaptation outcomes. This long-delayed framework is expected to be established at COP30.



As discussions progress, experts around the world emphasise the need to consider local and indigenous knowledge systems in this process. Across India, for example, traditional seed varieties, water-harvesting structures, and community-based ecosystem restoration efforts offer proven models of resilience.

Finance: the missing piece

Under the Paris Agreement, economically developed countries pledged \$100 billion per year to finance climate action in developing nations. At COP29, a breakthrough agreement called the NCQG on Climate Finance was reached. This target is expected to triple climate finance from \$100 billion to \$300 billion annually by 2035 and scale up finance from all actors, both public and private, to \$1.3 trillion per year by 2035.

However, it should be noted that the \$300 billion is significantly less than the estimated trillions of dollars needed by economically developing countries, with the latter arguing that the use of “all actors” to scale up finance has diluted the common but differentiated responsibilities principle, which also includes historical emissions. “All actors” means every potential source of climate finance, not just developed-country governments. It lumps together public treasuries, multilateral development banks, private investors, philanthropies, sub-national authorities, and even developing countries’ own private sectors.

The Loss and Damage Fund, set up in COP28, is also grossly underfunded, receiving less than a billion dollars against an annual need running into hundreds of billions of dollars. For developing countries, this finance is an enabler of ambition, enhancing preparedness for extreme climate events, expanding climate-resilient agriculture, and accelerating the adoption of renewable energy.

COP30 is expected to finalise the reporting requirements and financing arrangements under the NCQG. One looming question at Belém is: will a credible pathway emerge for moving from the \$300 billion to the \$1.3 trillion target and build confidence in developing countries? And will Belém also finalise the modalities of finance: who will pay, who will gain, and how it will be accounted for?

Transition and ambition

Transitions must be fair as economies move towards net zero (i.e. that humans add no net greenhouse gases to the atmosphere over a period; emissions are reduced almost to zero, and any residual sources are balanced by removals, e.g. restoring forests and carbon capture) — and transformation can’t be fuelled solely by finance. Access to reasonably priced technology and capacity building are equally important for many developing countries, be it efficient water systems, resilient crops, or clean energy, which are frequently hindered by high costs or intellectual property issues.

Beyond promises, COP30 should lead to North-South collaborations for training, innovation, and technology sharing. Otherwise, climate transition runs the risk of becoming yet another area of inequality. In countries like India, investments in low-carbon manufacturing, renewable energy, ecosystem restoration, green skills development, small businesses, and alternative livelihoods must all be part of a “just transition.”

Countries were expected to update their Nationally Determined Contributions (NDCs) through 2035 and submit them by February 2025. However, according to Climate Action Tracker, many



countries are yet to submit their reports. The ones submitted so far account for only 19% of global emissions.

Negotiations at COP30 are expected to address the insufficient ambition of climate targets and reveal whether countries are prepared to put aside rhetoric and match science and ambition, a significant challenge in the absence of climate finance.

Climate-nature nexus

A key spotlight of Belém is the long-overdue integration of climate and biodiversity agendas. Brazil is pushing for an innovative financing model for conservation, known as the ‘Tropical Forest Forever Facility’. The proposal aims to compensate more than 70 developing countries with tropical forests for their efforts to preserve them.

This growing recognition that climate and biodiversity crises are interlinked could make climate finance more effective, directing funds to ecosystem restoration, agroforestry, and community-led conservation.

India at COP30

At Belém, India will be championing climate justice and the principle of common but differentiated responsibilities, urging developed nations to take the lead in emission cuts and financial support. In fact, at the mid-year climate talks in Bonn, India played a pivotal role in coordinating the G77+China bloc of developing countries to advocate for a fair and predictable finance goal under the NCQG framework.

This positioning reinforces India’s role as both a responsible power and a representative of broader southern concerns while serving as a bridge between the Global North and South.

However, while India’s domestic targets are ambitious, efforts in the institutional landscape remain a work in progress, as reflected in initiatives such as green budgeting, sovereign green bonds, and the proposed national carbon market expected by 2026.

This gap must be viewed in the context of India’s developmental realities, which continue to shape its climate choices and actions.

The stakes could not be higher at COP30. The Amazon setting underscores the urgency of protecting the world’s ecosystems while tackling emissions. For India, it is a moment to shape the conversation, striking a balance between domestic imperatives and global responsibilities. What unfolds in Belém will go a long way towards determining whether the international community can still bend the curve of emissions and whether emerging economies, such as India, can secure the space and support they need for economic growth that is resilient to climate change.

FINANCE, TRADE KEY AGENDA ITEMS, CLIMATE MEET LIKELY TO BE STORMY

With a key demand of the developing countries on international finance getting included in the provisional agenda of the conference, the COP30 climate meeting in Belem, Brazil, which began Monday, is set to witness a fresh stand-off between the developed and developing nations on the issue of finance which seemed to have been settled last year.

— The list of items on the provisional agenda of the two-week conference includes a discussion on Article 9, paragraph 1 of the Paris Agreement, which says that developed countries “shall



provide financial resources” to assist developing country parties with respect to mitigation and adaptation.

— The developing countries, including India, have been arguing that this particular provision had not been addressed in the agreement on finance that was finalised at last year’s climate meeting, COP29, in Baku, Azerbaijan. That agreement only dealt with the obligation of developed countries to “mobilise” financial resources for developing countries. The agreement finalised in Baku asked the developed countries to mobilise at least US\$ 300 billion every year from 2035, tripling their current obligation.

— The Paris Agreement obligates the developed nations to both “provide” finance (Article 9.1) as well as “take the lead in mobilising climate finance” (Article 9.3) for developing countries. These two are related but independent obligations. One does not negate or take precedence over the other.

— Article 9.1 can imply the provision of public or government funds by the developed countries, while Article 9.3 allows them to mobilise financial resources from private or any other source. — The developing countries have been demanding that international climate finance should have a greater component of public funds, should be new, additional and predictable, and should mostly be in the form of grants or soft loans. They have maintained that last year’s finance agreement only addressed the mandate in Article 9.3. The obligation under Article 9.1 still remains outstanding.

— They have been using this argument to push back, after their demand for raising the amount of climate finance from the current US\$ 100 billion a year to US\$ 1.3 trillion a year had been ignored in last year’s agreement. The US \$300 billion a year amount had come as a big disappointment for the developing countries, with India making an uncharacteristically angry statement in reaction.

— At the annual mid-year conference in Bonn in June this year, the developing countries had disrupted the talks for almost two days on this issue of Article 9.1 obligation. It was then decided that this issue be proposed to be included as a formal agenda item in COP30.

— Accordingly, the provisional agenda has listed this issue at the request of Bolivia, which moved the proposal on behalf of the Like-Minded Developing Countries (LMDC) group, which includes India.

— The agenda also has an item on “trade-restrictive unilateral measures”, a reference to Carbon Border Adjustment Mechanism (CBAM), a form of carbon tax imposed by the European Union on the import of certain goods. CBAM seeks to impose a tariff on imported goods like steel or aluminum if their production had a greater carbon footprint than the standards prescribed for EU manufacturers.

— The developing countries have objected to CBAM, saying this was a restrictive trade practice in the garb of climate regulation, and violative of international trade rules. This issue had come up at last year’s meeting in Baku as well, and held up negotiations for two days. The matter has remained unsettled. The provisional agenda has to be approved by consensus at the COP meetings.

Do You Know:

— In 1992, at the Rio Earth Summit, 154 countries signed a multilateral treaty called the United Nations Framework Convention on Climate Change (UNFCCC). It aimed to stabilise greenhouse



gas concentrations “at a level that would prevent dangerous anthropogenic (human-induced) interference with the climate system.”

— The treaty came into force two years later, and since then, countries which are part of the UNFCCC, meet every year at different venues.

REACH NET-ZERO EMISSIONS SOONER, AIM FOR NET-NEGATIVE: INDIA TO DEVELOPED NATIONS

With current levels of global climate action unable to make any significant dent in rising temperatures, India has called on developed countries not just to achieve net-zero emissions status earlier than scheduled but to begin targeting net-negative emissions.

— Speaking at the Leaders’ Summit in Belem, Brazil, a two-day meeting of heads of states or governments, ministers and country representatives ahead of the COP30 climate conference next week, India’s ambassador to Brazil Dinesh Bhatia said global ambition to fight climate change continued to remain inadequate, mainly because the developed countries had not been making proportionate contributions.

— Net-zero emissions is a situation in which a country’s total greenhouse gas emissions being released in the atmosphere are balanced with absorption or capture of these gases either in natural sinks like forests or through technological interventions like carbon capture and sequestration. A net-negative situation will arise when the absorptions or capture exceed emissions.

— The world as a whole has set 2050 as its target year to achieve net-zero status, while individual developed countries have set varying deadlines between 2040 and 2050.

— China, the world’s largest emitter, has announced that it aims to become net-zero by 2060, while India plans to achieve net-zero by 2070. No country has a declared plan to achieve a net-negative emission status as of now.

— As of now, the world is nowhere near achieving the temperature targets outlined in the 2015 Paris Agreement, or in preventing further global warming. According to one assessment, global annual emissions needed to be reduced by at least 43 per cent below 2019 levels by the year 2030 to keep alive any hopes for achieving the 1.5 degree Celsius target. However, at the current pace of climate action, it is estimated that even a 2 per cent reduction by 2030 would be difficult to achieve.

— Over the last couple of years, particularly in the wake of the United States’ withdrawal from the Paris Agreement earlier this year, doubts have arisen about the UN-mandated climate negotiation process’s ability to deliver results that effectively tackle climate change.

Do You Know:

— The Paris Agreement is an international accord that was adopted by nearly every country in 2015 to address climate change and its adverse effects.

— Its primary goal is to substantially reduce greenhouse gas (GHG) emissions in a bid to limit global warming in this century to “well below” 2 degrees Celsius above pre-industrial levels while pursuing the means to curb warming to 1.5 degrees.



- The agreement mentions the safer limit of 1.5 degrees based on a fact-finding report which found that breaching the threshold could lead to “some regions and vulnerable ecosystems” facing high risks, over an extended, decades-long period.
- The treaty also requires all Parties (countries which have joined the agreement) to state every five years what they are doing to tackle climate change — what is known as their nationally determined contribution (NDC).
- The UNFCCC laid down ambitious objectives for addressing climate change, but the framework itself was not sufficient and there was a need for establishing further processes to build the convention and strengthen its objectives.
- Over time, the Framework Convention paved the way for the development of institutions, processes and structures, aimed at enhancing global cooperation, such as the establishment of the Conference of the Parties (COP), which serves as the convention’s governing body.
- Each year, the COP brings together representatives of the Parties (countries that have ratified the UNFCCC) to assess progress, negotiate further agreements, and refine commitments.
- Conference of the Parties or COP is the world’s only multilateral decision-making forum that brings together almost every country on the planet to formulate and implement policy responses to climate change collectively. Currently, there are 198 parties (197 countries plus the European Union) to the UNFCCC.

NEW FUND TO PROTECT TROPICAL FORESTS & WHY IT’S BEING CRITICISED

In a bid to conserve the world’s tropical forests, a new fund was launched at a high-level event last week on the sidelines of the COP30 climate summit in Belém, Brazil. Known as the Tropical Forest Forever Facility (TFFF), the fund aims to raise and invest \$125 billion, channeling returns to developing countries that conserve their forests.

— Speaking at the fund’s launch event on November 6, Brazil’s President Luiz Inácio Lula da Silva described the TFFF as “an unprecedented initiative”. He also said that “for the first time, Global South countries will have protagonism in the forest agenda”.

— While Brazil expects the TFFF to transform the world’s approach to environmental conservation, several experts have raised concerns about how it will work in practice.

— The TFFF is an investment fund designed as a permanent, self-financing vehicle through which net returns will be awarded to up to 74 developing tropical forest countries for keeping their existing old-growth forests intact.

— The fund will look to raise \$25 billion from wealthy governments and philanthropists, and an additional \$100 billion in private investment. Then, the amount will be invested into a mixed portfolio of investments, including public and corporate market bonds, with annual returns used as a reward to tropical forest nations for conserving their forests. Note that payments to countries will be based on satellite remote sensing data that track forest canopy cover annually in a low-cost and transparent manner.

— One of the primary reasons for the launch of TFFF is deforestation. There is more global market value for dead forests than when they are alive. For instance, the benefits of standing forests, such



as temperature reduction and wildlife habitat, are taken for granted. Meanwhile, clearing the land for monocultures of crops like soy is financially incentivised.

— The TFFF is designed to change this and pay for the conservation of the world's major tropical forests, which provide a range of ecosystem services, including carbon storage. Put simply, the fund will help landowners to conserve forests by ensuring that the value they bring as standing forests is more than from cutting them down.

— One of the biggest criticisms of the TFFF is that it is too vulnerable to the volatility of financial markets, as it plans to invest in bonds in developing nations that have historically been prone to fluctuations. For instance, the TFFF may not be able to pay returns to countries if markets crash like they did during the COVID-19 pandemic, or the 2008-09 financial crisis.

— Another concern is that the fund dilutes the legal obligation of developed countries to pay their fair share of nature finance. That is because the TFFF is not officially part of the UN Framework Convention on Climate Change (UNFCCC), and is not subject to the same responsibilities that govern the UN climate negotiations, where the onus falls on developed countries.

Do You Know:

— Delivering India's statement at the Leaders' Summit of COP30 in Belem, Brazil, Indian Ambassador to Brazil Dinesh Bhatia said, "India welcomes and supports Brazil's initiative in establishing the Tropical Forests Forever Facility (TFFF), representing a significant step towards collective and sustained global action for the preservation of tropical forests. India is pleased to join the Facility as an observer."

— The TFFF could support over 70 Tropical Forest Countries (TFCs) that currently host over 1 billion hectares of moist broadleaf tropical and subtropical forests.

— Eligible participants include tropical countries with broadleaf rainforests that meet the following criteria:

- (i) Annual deforestation rate below 0.5%; the annual rate cannot increase above the rate at entry;
- (ii) Reliable, auditable, and transparent monitoring systems;
- (iii) Mechanisms ensuring fair resource allocation to Indigenous Peoples and Local Communities;
- (iv) Sign up to the initiative's charter – compliance with transparency and accountability standards.

— Notably, high-income countries and areas with monoculture forests are not eligible for the program.

\$300 MN COMMITTED FOR HEALTH IMPACTS OF CLIMATE AT COP30

About 80 countries and organisations came together at COP30 in Belem, Brazil to launch the Belem Action Plan for Health and Climate Adaptation, aimed at strengthening global health systems to cope better with impacts of climate change.



— Meanwhile, about 35 philanthropies, under the banner of Climate and Health Funders Coalition, announced an initial commitment of US \$300 million for integrated action to deal with both the causes of climate change as well as its consequences on human health. This money would also support the implementation of the Belem Health Action Plan and be used for accelerating health solutions where they are needed the most, a statement said.

— At an event organised by the COP30 organisers, Global Climate and Health Alliance and Carbon Copy, speakers highlighted the acute finance gap for adaptation and even lesser for health-focused adaptation plans.

— The 2025 Lancet Countdown Report on Health and Climate Change, which has documented the global health impact of climate change, is the basis for the Belem Action Plan on Health.

— This report, published last month, had revealed that the number of climate change-related deaths was in the millions, and millions more were affected by extreme heat, extreme rainfall and flooding, ever more vicious storms and creeping desertification.

— The discussion at the Belem event highlighted that the health finance gap was a critical component of the overall adaptation finance gap, and the world's inaction was further compounding the situation and the cost.

— The latest Adaptation Gap Report had estimated that developing countries' requirements would be in the range of US \$310-365 billion a year by 2035. The international community is struggling to mobilise the US \$40 billion annual flows that was promised in Glasgow in 2021.

Do You Know:

— The year 2024 was the hottest on record, with catastrophic consequences for the health, lives, and livelihoods of people across the globe, says a new report of The Lancet Countdown on Health and Climate Change.

— Worldwide, the average person was exposed to a record extra 16 health-threatening hot days owing directly to climate change, with the most vulnerable (those aged under 1 year and over 65 years) experiencing, on average, an all-time high of 20 heatwave days—a 389% and 304% increase, respectively, from the 1986–2005 yearly average. In 2024, people in India were exposed to 19.8 heatwave days each, on average. Of these, 6.6 days of exposure would not have been expected to occur without climate change.

— The UNEP's Adaptation Gap Report 2025 released in the run-up to COP 30, shows that developing countries will need \$310 billion annually between now and 2035 to protect people from searing heat, rising seas, rivers in spate and deadly storms — this is nearly 12 times the finances currently allocated for adaptation.

DON'T USE COP30 TO CHANGE PARIS DEAL 'ARCHITECTURE': INDIA

India made its opening statement at COP30 in Belem, Brazil, underlining that the climate conference ought to be stressing “adaptation”, and the 10th anniversary of the Paris Agreement, signed in 2015, should not be used to “change the architecture” of that consensus.

This “architecture” refers to the agreed-upon principle of “common but differentiated responsibilities (CBDR)”, which means that all countries must do their bit to curb fossil fuel emissions but without compromising on national economic-development priorities.



Dwindling finance

With the withdrawal of the United States from the Paris Agreement and developed countries agreeing to mobilise only \$300 billion — and not the demanded \$1.35 trillion annually — by 2035 as “climate finance” (to cope with unfolding climate disasters as well as move away from fossil fuels), developing countries, including India, saw this as a reneging on agreed commitments.

“We must remain committed to and guided by equity and common but differentiated responsibilities. The cornerstone principles of the Convention and its Paris Agreement signed all of us to the CBD in Brazil back in 1992. We must reaffirm our strongest commitment to the principles here, not attempt to sideline and ignore them,” India delegation member Suman Chandra said as part of a collective of Like-Minded Developing Countries (LMDC) on Tuesday.

“Over the next two weeks, we must stay true to the cause and advance adaptation, which is among the most important issues for us. The [Brazil COP] Presidency must make a special call to the Parties to submit their National Adaptation Plan in line with national priorities and progress,” she added.

The LMDC is a large collective that represents nearly half of the world’s population, and consists of China, India, Pakistan, Indonesia, Bangladesh, Cuba, Egypt and several others.

India is yet to submit its National Adaptation Plan and the updated Nationally Determined Contribution, which specifies steps to curb fossil fuel emission by 2035, to the United Nations.

“We are not here to point fingers, but the facts speak for themselves. We cannot simply bypass the roadblocks and the impediments to implementation,” Ms. Chandra added.

“Developed countries need to reach net zero much earlier than projected. They should invest significantly more in negative emission technologies,” Tanmay Kumar, Secretary, Environment Ministry and part of the India delegation, said on behalf of a joint statement by another grouping called BASIC (Brazil India China South Africa). The LMDC had pushed for including a discussion on the responsibility of developed countries on the COP30 agenda but in the larger spirit of “consensus” was moved to a separate negotiating track by COP30 President André Corrêa do Lago.

STUDY CALLS FOR TAILORED TREATMENTS FOR REGIONAL HIV VARIATIONS

The most promising antibody-based treatments for HIV (human immunodeficiency virus) do not work equally well in patients from all regions with the geographical origin of the virus affecting their effectiveness, a new Indian research has found.

— The research, published in the Journal of Virology, has significant implications for the ongoing development of a vaccine for HIV, suggesting that future HIV vaccines need to be optimised for different regions.

— In the absence of a vaccine, injectable antibodies are currently being tested as a way to prevent HIV infection. A vaccine usually triggers the body’s own immune mechanism to produce antibodies against a specific disease. Antibodies are proteins made by the immune system that are able to recognise and neutralise foreign disease-causing organisms like viruses or bacteria.

— Since a vaccine against HIV is still not available, scientists have been testing the efficacy of injecting specific antibodies, identified and isolated in the laboratories, that have been found to prevent infection by HIV



— There are several variants, or clades, of HIV in circulation. The most widely-circulating variant, called HIV-1 Clade C, accounts for nearly half of all infections across the world. This is also the most common variant circulating in Africa and India.

— HIV mutates very quickly after infecting a person, sometimes creating millions of slightly different versions of itself. Most antibodies are unable to fight against, or neutralise, all of them.

— However, scientists have been able to identify and isolate some rare antibodies that can neutralise a large number of these slightly different variants. For this reason, these antibodies are called broadly-neutralising antibodies, or bnAbs.

— However, the new Indian study has shown that the effectiveness of these bnAbs was affected by the geographical origin of the virus.

— It is found that HIV-1 clade C strains circulating in India differ from those primarily found in Africa in terms of their genomic composition and neutralization susceptibility to clinically-relevant bnAbs.

— This study also identified pre-treatment drug resistance in up to 11 per cent of participants and according to the authors this finding highlighted a growing concern in HIV management.

— He also observed that this study highlights that monoclonal antibodies are a high-value area for development and investment.

Do You Know:

— Acquired Immuno Deficiency Syndrome is a pandemic disease caused due to Human Immunodeficiency Virus (HIV), which causes damage to the immune system that is responsible for helping the body fight infections.

— If HIV goes untreated, it can kill CD4 cells, a kind of immune cells. The more the number of CD4 cells HIV kills, the more you are at risk of contracting various kinds of infections and the infections becoming incurable.

— Every vaccine undergoes “extensive and rigorous” testing and screenings and evaluations to determine the antigen that should be used to invoke an immune response. This does not involve testing on humans but on animals. If the vaccine triggers an immune response, it is then tested in human clinical trials in three phases, explains WHO.

— In the first phase, a select number of volunteers are administered the vaccine to test if it generates an immune response and to determine the right dosage.

— In the second phase, it is then given to several hundred volunteers. This phase involves multiple trials to evaluate the effect of different formulations of the vaccine on various age groups. Included in this is another group that is not given the vaccine to compare the results and understand if the changes in the vaccinated group have happened by chance or because of the vaccine.

— Finally, in the third phase, the vaccine is given to an even larger group of volunteers and compared to a similar group of people who are not vaccinated. This phase is usually conducted across multiple countries and sites within a country.

— Once the results of these clinical trials are obtained, officials in each country closely review the data and then decide if the vaccine can be authorised for use.



WHAT DOES NEW STUDY SHOW ON DIABETES RISKS?

The story so far:

India has one of the highest burdens of Non-Communicable Diseases (NCDs) globally, with over 100 million people living with diabetes and another 136 million classified as pre-diabetic. Despite this, most diagnoses still rely on conventional tools and tests which often detect the disease only after significant damage has occurred. A new study published in the Journal of Proteome Research by researchers from IIT Bombay, Osmania Medical College, and Clarity Bio Systems suggests that tiny molecules in blood, known as metabolites, could serve as early warning signals for diabetes and its complications, particularly kidney disease.

What are biochemical markers?

Biochemical markers are small molecules produced during metabolic processes in the body. These include sugars, amino acids, lipids, and other compounds that reflect the state of various organs and systems. Metabolomic profiling, the large-scale study of these molecules, allows researchers to detect subtle changes in the body's chemistry that may precede disease. Using advanced techniques like liquid chromatography and mass spectrometry, scientists can analyse hundreds of metabolites from a single blood sample.

In the recent study, researchers used dried blood spots, a simple finger-prick method, to collect samples from 52 individuals, including healthy participants, diabetics, and those with diabetic kidney disease (DKD). They found distinct patterns in the levels of certain metabolites that could help identify disease risk earlier than usual tests.

What did the study find?

The study identified 26 metabolites that differed significantly between healthy individuals and those with diabetes. These included expected markers like glucose and cholesterol, but also lesser-known compounds such as valerobetaine, ribothymidine, and fructosyl-pyroglytamate. Among those with kidney complications, seven metabolites — including arabitol, myo-inositol, and 2PY — showed a progressive increase from healthy to diabetic to DKD stages. Sneha Rana, the study's first author and a Ph.D scholar in Professor Pramod Wangikar's lab at IIT Bombay, explained, "Type 2 diabetes is not just about high blood sugar; it disrupts multiple metabolic pathways that standard tests often miss."

The study also revealed two distinct subgroups among diabetics. One group had metabolic profiles closer to healthy individuals, while the other showed pronounced changes in markers related to stress, inflammation, and energy metabolism.

Why is this important for India?

According to the Indian Council of Medical Research – India Diabetes survey, 11.4% of adults have diabetes and 15.3% are pre-diabetic. The country also faces high rates of hypertension, obesity, and other metabolic risk factors. Yet, more than 80% of people with NCDs remain undiagnosed or inadequately treated. Early detection tools like metabolomic profiling could be transformative. By identifying disease risk before symptoms appear or organs are damaged, healthcare providers can intervene earlier, potentially preventing complications such as kidney failure, heart disease, and nerve damage. If validated in larger studies, metabolomic markers could be used to develop low-cost, field-friendly tests for early screening. The use of dried blood spots makes sample collection



easy and scalable, especially in rural and underserved areas. Moreover, metabolomic profiling could enable personalised care. Patients could be grouped based on their metabolic profiles, allowing doctors to tailor interventions, from lifestyle changes to medication, based on individual risk.

Are there limitations to this approach?

While the findings are promising, the study had a small sample size and needs to be replicated across larger and more diverse populations. Translating metabolomic data into clinical practice also poses challenges, including standardising lab protocols, ensuring regulatory approvals, and making the technology accessible. Mass spectrometry, the technique used to analyse metabolites, is expensive and not widely available outside research settings. Developing affordable versions of these tests will be crucial for widespread adoption.

Researchers are planning larger cohort studies to validate these findings and explore how metabolomic markers perform across different age groups, ethnicities, and comorbidities. If successful, India could lead the way in integrating metabolomics into routine healthcare, shifting from reactive treatment to proactive prevention.

IMMUNE CELLS PRIMED FOR RHEUMATOID ARTHRITIS YEARS BEFORE SYMPTOMS APPEAR

For millions worldwide, waking up with stiff, aching fingers that take hours to loosen is a daily battle — one waged by their own immune system. This is rheumatoid arthritis, a condition where the body's defences mistakenly attack the joints they're meant to protect.

Currently affecting about 18 million people worldwide, the Global Burden of Diseases, Injuries, and Risk Factors Study projected an alarming 80% rise in rheumatoid arthritis cases over the next 30 years. Rheumatoid arthritis often strikes between the ages 30 and 60, and women are three times more likely to develop it than men. Scientists still don't know exactly why, but genetics, hormones, and environmental triggers like smoking or certain infections all appear to play a role.

While modern therapies have considerably improved patients' quality of life, most patients are diagnosed only after the immune disruption has reached an advanced stage. The condition can affect the joints as well as the lungs, the heart, eyes, skin, and many other organs. Chronic inflammation increases the risk of heart disease and causes fatigue, fever, and depression.

A new study in Science Translational Medicine, in which researchers mapped the hidden preclinical evolution of rheumatoid arthritis at the molecular level, could lead to the next leap in patient outcomes. The study has revealed that the immune cells are primed to become troublesome years before the first symptoms appear. In future, therefore, clinicians could potentially intervene early before joints are damaged.

Silent stage

One of the earliest warning signs of RA is the presence of anticitrullinated protein antibodies (ACPAs). These antibodies can appear in blood tests three to five years before the first clinical signs of arthritis. People who test positive for these antibodies but have no symptoms are labelled "at-risk individuals," a definition adopted by clinical trials such as APIPPRA. Not everyone in this group will develop RA. Roughly a third progress to the disease, while the rest remain symptom-free.