

12th to 18th January 2025

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INTERNATIONAL

PRESIDENTIAL REPRIEVE

President-elect Donald Trump was handed an “unconditional discharge” in a felony case in New York, where he was earlier found guilty on 34 counts of falsifying business records to make \$1,30,000 in hush-money payments to an adult films star over an alleged affair. Following his conviction last May, one of four criminal indictments that he faced at the time, Mr. Trump went on to win the November 2024 election and will be sworn into office on January 20. In accordance with the legal immunity for official acts that is offered to the office of the President of the U.S., a position affirmed recently by the Supreme Court, three indictments that had not yet reached the stage of a conviction or acquittal were either dismissed or came to a halt owing to procedural complexities. His indictment for his role in instigating a mob attack on the U.S. Capitol in January 2021 and his indictment for mishandling classified documents discovered at his home in Florida, after his 2020 election defeat, were withdrawn by then Special Counsel Jack Smith because the Department of Justice “forbids the federal indictment and subsequent criminal prosecution of a sitting President”. A state-level case in Georgia relating to allegations of tampering with the 2020 election’s vote-counting process was paused pending a decision by an appeals court. In the New York case, following his appeal to delay the sentencing, the Supreme Court ruled that sentencing could proceed after the judge, Juan Merchan, said that he would hand down an unconditional discharge — implying no jail time, monetary fine, or probation — given that this would be “the most viable solution” in such unprecedented circumstances.

Other than facing the routine conditions of a ban on convicted felons owning guns and being required to provide the State of New York criminal database with a DNA sample, Mr. Trump has emerged unscathed from the legal quagmire prior to his 2024 victory. The deeper questions that America will wrestle with, however, transcend these legal minutiae — they relate to the fact that Mr. Trump, his 2024 campaign, and the MAGA movement more broadly, remain polarising and there is near-complete breakdown of bipartisanship within political circles as applicable to critical issues of social and economic policy, including the economy and jobs, reproductive rights, the criminal justice system and immigration reform. Liberal and progressive Americans must, understandably, be hoping, in the light of his comprehensive victory leading to a federal government trifecta, that Mr. Trump will strike a conciliatory note on Inauguration Day, and follow that up with a more bipartisan approach to policymaking in the four years ahead. The cost of not doing so appears to be high indeed.

THE ISLAND OF INTEREST

On January 1, the King of Denmark unveiled a new coat of arms after more than 50 years. It features the polar bear and the ram (symbolising Greenland and the Faroe Islands, respectively) more prominently than before. Amid calls for independence in Greenland and U.S. President-elect Donald Trump’s aggressive push to buy/annex the island, the Royal House seems to be underscoring the Danish realm’s unity.

Greenland, the world’s largest island with a population of 57,000, is an autonomous territory controlled by Denmark. This effectively means that while it has a Parliament which deals with domestic affairs such as business taxes, immigration, and mining, most of its foreign, monetary and military policy are dictated by Denmark. The Arctic island was colonised by the Danes in the



18th century and has been associated with Europe, though geographically it is part of the North American continent and closer to the U.S. than Copenhagen.

During the Second World War, the U.S. briefly occupied the region and defended it when Denmark was under siege by Nazi Germany.

Noting the region's geopolitical importance, the U.S. in 1946, after the War, had offered to buy it from Denmark. Denmark rejected the offer and ever since Greenland has been a part of the Danish realm with home rule granted to the island in 1979. The U.S. runs and operates an air base on the island. However, of late, calls for complete independence from Denmark have been rising in the island. Greenland's Prime Minister Múte Egede in his New Year address talked about taking the "next step" and removing the "shackles of colonialism".

U.S. aspirations

In his first term in office, Mr. Trump had floated the idea of buying Greenland. However, this time it seems the President-elect is serious. "For purposes of National Security and Freedom throughout the World, the United States of America feels that the ownership and control of Greenland is an absolute necessity," he said in December. Following such a declaration, Donald Trump Jr., Mr. Trump's son, visited Greenland this year as a "private individual". Both Greenland and Danish Prime Ministers have shut down such threats and plans. Mr. Egede has categorically stated that "Greenland belongs to the Greenlanders".

Mr. Trump seems unfazed. Speaking to the press last week, Mr. Trump said he won't rule out military or economic coercion to annex/buy the island.

The island is surrounded by the Atlantic on one side and the Arctic waters on the other. Due to climate change and global warming, glaciers and ice sheets in the Arctic Sea are melting, leading to potentially new shipping routes, which could greatly enhance trade. Moreover, Russia and China have already agreed to develop new trading routes in the Arctic waters as relations with the West sour and tensions in West Asia loom large.

Last November, both countries developed a subcommittee for cooperation on the northern sea route, which spans 5,600 km from the Barents Sea near Scandinavia to the Bering Strait near Alaska. With the threat of Russia-China cooperation in the region, annexing Greenland could give the U.S. significant control over the area, letting it decide who gets to run and operate in these strategic waters.

The island is also rich in minerals. As per a 2025 survey, 25 of 34 critical raw materials, which are used in EVs and batteries, were found in Greenland. The melting of almost 28,000 square km of Greenland's ice sheets makes drilling for oil, gas and other critical raw materials easier. Currently, China is the world's largest exporter and producer of critical minerals. Buying Greenland could make the U.S. compete with China for that status.

Mr. Trump has also issued calls to buy/annex the Panama Canal and Canada. While all of them have been touted as necessary for the U.S.'s economic and national security, the U.S. is breaking the first and fundamental rule of the UN Charter: recognising the sovereignty of nations. With respect to Greenland, the U.S. is going against the NATO agreement as well.

Similarly, the Arctic waters are a global common under the UN Convention on the Law of the Sea. The incoming U.S. President's policies are bringing to the forefront the true anarchical nature of international politics.



TRUMP'S CALL TO RENAME GULF OF MEXICO: HISTORY OF NAMES 'AMERICA', 'MEXICO'

US President-elect Donald Trump said on Tuesday (January 7) that he will change the name of the Gulf of Mexico to "Gulf of America".

- This follows a number of hostile statements in which Trump targeted US neighbours, from threatening to take control of Greenland and the Panama Canal, to referring to Canada, as the United States' "51st" US state.
- Trump's "Gulf of America" statement was part of a larger tirade against issues of trade deficit and illegal immigration from Mexico.
- In response, Mexico President Claudia Sheinbaum told reporters that North America should be renamed "Mexican America", referring to what the continent was called in some 17th-century maps. Surrounded by old maps on a screen at a briefing, Sheinbaum said sarcastically, "Mexican America, that sounds nice."

Do You Know:

- Of the several theories surrounding the origins of the name "America", the most frequently cited one stems from its first documented use on a map.
- When Christopher Columbus sailed to the Americas in 1492, he did not know that he had reached a different continent, previously unknown to most in Europe. (The Vikings had explored parts of North America some five centuries before Columbus). Columbus was followed by many other European voyagers who decided to make the treacherous journey across the Atlantic.
- Merely a decade after Columbus came the Italian explorer Amerigo Vespucci. He was the first to write about the existence of a "New World" in his letters, although many of his accounts are today taken with more than a grain of salt.
- Nonetheless, when a German scholar named Matthias Ringmann caught hold of these letters, he and fellow cartographer Martin Waldseemüller decided to create a map of the world, which would include this newfound landmass. It would be a mammoth project, with 12 pieces of paper joined together.
- On the bottom left was a narrow strip of land marked "America", inspired by Amerigo Vespucci's first name.
- The US Library of Congress says of the map: "Martin Waldseemüller's 1507 world map... supported Vespucci's revolutionary concept by portraying the New World as a separate continent... It was the first map, printed or manuscript, to depict clearly a separate Western Hemisphere, with the Pacific as a separate ocean. The map represented a huge leap forward in knowledge..."
- Coming to Mexico, the story behind its name is often linked to a powerful empire that once controlled the region. It is said to be derived from the Nahuatl language spoken by the Aztecs who ruled between the 14th and 16th centuries. According to the Mexican government's website, the most accepted theory about the origin of the word 'Mexico' "points out that it is formed from three Nahuatl words: metztli meaning 'moon'; xictli which translates to 'belly button' or 'centre'; and the affix -co indicating 'place'."



- It refers to the olden city of Tenochtitlan, founded on an islet on the Texcoco Lake, previously known as the Moon Lake. Mexico's official name (first used in 1824) is "United Mexican States", inspired by the USA, since it too is a federation of states.

WITH TRUMP'S RETURN, BRAZIL DISPLAYS A JUDICIAL PATH NOT TAKEN BY THE U.S.

A polarised nation. A right-wing populist casting doubt on the electoral system then refusing to concede. A riot by his supporters in the capital aiming to keep him in power.

This isn't just the story of Donald Trump, but also that of Brazil's Jair Bolsonaro. The Western Hemisphere's two largest democracies faced similar challenges in 2020 and 2022, respectively, but their institutional responses have been dramatically different.

Brazil moved swiftly to rule Mr. Bolsonaro ineligible for office until 2030, a penalty that could be extended by ongoing criminal investigations. In Washington, however, Republicans in the Senate helped acquit Mr. Trump in an impeachment trial that would have prevented him from seeking the presidency again.

Different approaches

Brazil's democracy is young, having emerged from military dictatorship four decades ago. The ghost of authoritarianism, which led millions to watch the new movie *I'm Still Here*, continues to haunt many Brazilians — although Mr. Bolsonaro, an outspoken cheerleader of the past regime, still won his first presidential race handily.

By contrast, the U.S. of 2020 had no memory of homegrown authoritarianism, which "gave rise to a lot of naivete," according to Steven Levitsky, author of *How Democracies Die*.

Mr. Levitsky said the U.S. lacks effective constitutional mechanisms that, for better or worse, can ban parties and candidates deemed a threat. Brazil's Constitution was written in the wake of the dictatorship and in response to it, providing tools to prevent coups, according to anthropologist Isabela Kalil, a coordinator of the Extreme Right Observatory, a research group based in Minas Gerais state.

The Constitution grants the electoral authority authorisation to void candidacies or unseat politicians voted into office in situations that undermine the legitimacy of elections. The authority has the power to enforce decisions nationwide, unlike in the U.S. where each state determines whether someone can appear on its ballot.

Six months after Mr. Bolsonaro left office, the court barred him from running again until 2030, ruling that he had abused his power and sowed unfounded doubts about the electronic voting system.

"Our country has shown itself to have a robust democracy, the result of the zeal of the constituents who endowed the institutions with the democratic DNA of the Constitution," Justice Edson Fachin said, speaking last week at an event marking the anniversary of Bolsonaro supporters storming the presidential palace and Supreme Court in the capital, Brasilia.

It handled Mr. Bolsonaro's case "neither in a dramatic way to interrupt the election, nor in a way to transform Mr. Bolsonaro into a martyr, but rather in a certain way to isolate Mr. Bolsonaro enough, and that diminished the chances of him gaining political capital," Ms. Kalil said.



When electronic vote results came in, key members of the political establishment from across the spectrum endorsed them, including the lower house's Speaker Arthur Lira, a one-time Bolsonaro backer.

Legal actions

Mr. Bolsonaro isn't giving up. He has insisted he will be a presidential candidate in 2026, and polls show he would be competitive if allowed to run.

U.S. Attorney General Merrick Garland named a special counsel to oversee the investigation into Trump's efforts to overturn the election two years after the fact — in November 2022. Special counsel Jack Smith said in his report released on Tuesday that he believes his probe would have resulted in a conviction had voters not returned Mr. Trump to the White House, ruling out any prosecution.

Mr. Bolsonaro could stand trial for any of the cases at the Supreme Court by next year, and a conviction would extend his ineligibility for election by years, and possibly land him in jail. He has denied any wrongdoing, and accused the court of overstepping to persecute him.

Where U.S. and Brazilian authorities' responses align is in the prosecution of rank-and-file supporters who staged uprisings. More than 1,500 people who participated in the January 6 Capitol insurrection have been charged with federal crimes.

In Brazil, 898 people have been held criminally responsible for the January 8 riot, with 371 convicted and the remainder signing leniency agreements, according to a Supreme Court report released January 7. It said another 485 investigations are ongoing. Bolsonaro supporters claim they are being persecuted by Lula's administration.

WHAT LED TO THE AZERBAIJAN AIRLINES JET CRASH?

The story so far:

On December 25, 2024, an Azerbaijan Airlines flight, 4K-AZ65, en route from Baku in Azerbaijan to Grozny, the capital of Chechnya in Russia, with 67 passengers and crew, faced a series of serious technical difficulties. The weather appeared to have been a factor as the crew attempted to divert to Makhachkala in Russia. There was another diversion to Aktau in Kazakhstan by the eastern shore of the Caspian Sea, but the plane impacted the ground about three kilometres from Aktau's airport, and 38 passengers were killed. There are conflicting reports on the cause, linked to a series of holes in a part of the fuselage and a survivor passenger's video footage. Azerbaijani President Ilham Aliyev said "we can say with complete clarity that the plane was shot down... We are not saying that it was done intentionally, but it was done". Azerbaijan has said that the aircraft "was ordered" to fly across the Caspian Sea after it was denied landing at two Russian airports. Data from the black boxes have been decoded in Brazil, where the twin-engine aircraft, an Embraer ERJ-190AR, was manufactured.

What are the other details?

The flight data site, Flightradar24, has told *The Hindu* that "We can confirm that the flight was operating in an area affected by GPS jamming and spoofing, hence we did not see a large portion of the flight. The last portion of the flight was operated in an area of good coverage."



The website of Azerbaijan Airlines says the airline, which is a member of the International Air Transport Association (IATA), is in full compliance with International Civil Aviation Organization (ICAO) standards. The airline has announced the suspension of flights to several cities in Russia on the directive of the Azerbaijan State Civil Aviation Authority following preliminary results from an investigation into the crash.

A report on the President of Russia's official website, titled "Telephone conversation with President of Azerbaijan Ilham Aliyev, December 28, 2024", says: "The presidents had a detailed discussion of issues regarding the December 25 crash ... Vladimir Putin apologised for the fact that the incident happened in Russian airspace... It was noted during the conversation that the Azerbaijani passenger airliner was flying according to schedule and repeatedly tried to land at Grozny Airport. At that time, Ukrainian unmanned combat aerial vehicles (UCAVs) attacked Grozny, Mozdok and Vladikavkaz, and Russian air defence systems were repelling these attacks. The Russian Investigative Committee initiated a criminal case under Article 263 of the Criminal Code (violation of the rules for traffic safety and operation of the air transportation systems). Initial investigation is underway..."

A media report says that the flight data have been analysed by the Aeronautical Accident Investigation and Prevention Center (CENIPA), Air Force Command, the central investigative body that is overseen by the Brazilian Air Force. Investigators from Kazakhstan, Azerbaijan and Russia are also involved.

On January 3, 2025, the President of Kazakhstan, Kassym-Jomart Tokayev, said 17 international experts including those from ICAO and the Interstate Aviation Committee (IAC), the body representing some of the Commonwealth of Independent States (Azerbaijan, Armenia, Belarus, Kazakhstan, Kyrgyzstan, the Russian Federation, Tadjikistan, Turkmenistan, Uzbekistan), were invited to ensure an "impartial and objective incident investigation".

What does the accident highlight about conflict zones?

Dr. Hassan Shahidi, President and CEO, Flight Safety Foundation, Virginia, U.S., has told *The Hindu* that the operation of civilian flights in conflict zones is a complex issue that involves assessing the risks posed by ongoing hostilities. ICAO guidelines stress the importance of states providing up-to-date risk assessments and advisories to airlines about potential threats, including military activity, missile launches, or other hazards. Airlines, in turn, must conduct their own risk assessments. Under international law, specifically the Chicago Convention and its Annexes, the responsibility for ensuring the safety of civil aviation lies with states. If the crash is found to be caused by actions directly linked to Russia, whether intentional or negligent, questions of state responsibility and accountability under international law may arise, which may include legal actions and findings of criminal liability.

As the flight is said to have been subject to severe electronic and communication interference, Dr. Shahidhi said, "spoofing (sending false signals) and jamming (blocking or disrupting signals) can have severe impacts on aviation safety, particularly on navigation and communication systems. These technologies could interfere with Global Navigation Satellite Systems (GNSS), for example, GPS, ADS-B and transponder signals and communication systems. Enhanced cybersecurity measures, alternative navigation systems, and robust incident reporting mechanisms are needed to mitigate these risks".

An ICAO spokesperson has told *The Hindu* that ICAO has readied itself to support this investigation in the interest of aviation safety and security, deputing an ICAO expert to be

4TH FLOOR SHATABDI TOWER, SAKCHI, JAMSHEDPUR



deployed onsite as an observer to the international investigation team. He said, “The investigation, as prescribed by Annex 13, shall be conducted with the sole objective of preventing future accidents and incidents, through the collection and analysis of safety data and information. Annex 13 calls for a preliminary report to be produced within 30 days of the accident, with a final report to follow within 12 months.”

Conflict zones, with state and non-state players, pose immense risks to civil aviation and countries are responding to this growing threat with several initiatives. Canada’s Safer Skies initiative is one such example that was in response to the shooting down of a Ukraine International Airlines flight PS752 in 2020 after take-off from Tehran.

After the shooting down of Malaysia Airlines flight MH17 in 2014, the Dutch Safety Board’s final report gave rise to the “Risk Assessment Manual for Civil Aircraft Operations Over or Near Conflict Zones (Doc 10084, Restricted)” by ICAO.

The IATA Tactical Operations Portal gives aviation subscribers real-time alerts related to airspace and airport operations. It operates based on a five-level alerting system. Another group is the Expert Group on Risk Information overflying Conflict Zones (EGRICZ), which is an informal international group that puts out information on airspace conflict zone risk assessments. There is also the Safer Skies Consultative Committee which is a formal international platform that examines conflict zone threats.

Where are GPS interference hotspots?

Flightradar24 says that the jamming of signals has been prevalent in the area around the Black Sea, while spoofing is common around Iraq, Ukraine, Russia, and also the eastern Mediterranean Sea. It says that flight crew are aware of GPS jamming and spoofing and are trained in advanced risk management.

Have nation-states been involved in air accidents?

As the paper, “Navigating the Legal Horizon: Lawyering the MH17 Disaster” (2017), by Marieke de Hoon in the *Utrecht Journal of International and European Law*, points out, there have been about nine major cases. Some of them include the shooting down of a Cathay Pacific airliner by China in 1954; Libyan Arab Airlines flight 114 by Israel in 1973; Korean Airlines flight 007 by the then-Soviet Union in 1983; Iran Air flight 655 by the United States in 1988; the bombing of Pan Am flight 103 by ‘Libyan agents’ in 1988; Sibir Airlines flight 1812 by Ukraine in 2001; and MH17.

What about the legal issues?

Dr. Mohammad Owais Farooqui, Assistant Professor, Department of Public Law, College of Law, University of Sharjah, UAE, has told *The Hindu* that the accident poses important legal questions with regard to jurisdiction under the principles of international law.

It has drawn attention to the absence, ownership, and management of responsibility and authority in international aviation regulation, compensation, and state responsibility. In the investigations, there should be focus on how the existing international legal works and the bases, for example, the Chicago Convention and the Montreal Convention, regulate such occurrences, he says.

The law applicable to the liability for damage in this context is the Montreal Convention. Azerbaijan Airlines may be financially responsible for making compensation payments, but things get complicated if state responsibility is engaged, more so in a missile strike scenario. If there is



evidence that a state is involved, principles of state responsibility under the international law may prevail over the Montreal Convention and the responsible state may be under obligation to make reparation under customary international law.

Another area of law is international humanitarian law, he says. The Chicago Convention specifically bans the use of weapons against civil aircraft in flight, and if a state is involved, its conduct may amount to a breach of this law, especially if not in accordance with the principles of necessity and proportionality.

The Azerbaijan case, he says, highlights the necessity for more authoritative and codified regulation of international civil aviation activity, the enhancement of liability regulation at the global level, and cooperation within the international legal framework.

NORTH KOREAN TROOPS GAIN BATTLEFIELD EXPERIENCE FIGHTING ALONGSIDE RUSSIA

For weeks, Ukrainian troops braced for an unfamiliar enemy: North Korean soldiers sent to bolster Moscow's forces after Ukraine launched a lightning-fast incursion and seized territory in Russia's Kursk region over the summer.

Their arrival marked a new and alarming phase in the war. And while initially inexperienced on the battlefield, North Korean troops have adapted quickly — a development that could have far-reaching consequences as they gain combat knowledge in the war against Ukraine.

Unlike the Russian troops Ukraine has been battling for nearly three years, Kyiv's forces were uncertain about what to expect from this new adversary, drawn into the war after Moscow and Pyongyang signed an agreement pledging military assistance using "all means" if either were attacked.

With 1.2 million troops, North Korea's military ranks among the largest standing armies globally. But its post-Korean War foreign engagements have been limited, leaving them inexperienced with modern warfare technologies like drones.

"For the first time in decades, the North Korean Army is gaining real military experience," said Andrii Yusov, spokesperson for Ukraine's military intelligence agency.

Despite Ukrainian, U.S., and South Korean assertions that Pyongyang has sent 10,000-12,000 troops to fight alongside Russia in the Kursk border region, Moscow has never publicly acknowledged the North Korean forces.

'Subterfuge strategy'

The North Koreans wear Russian military uniforms with fake military IDs in their pockets, according to a report by a Ukrainian military unit that has observed them on the battlefield, and they could easily be mistaken for Russian soldiers. The subterfuge means Moscow and "its representatives at the UN can deny the facts," said Mr. Yusov. Among the things proving their presence is that they have been heard speaking Korean with North Korean accents in intercepted communications, he said.

Mr. Yusov said the North Korean troops are using their own weapons and equipment and have learned to cope with the improvised explosives-laden drones that have become emblematic of the war, first-hand experience even some NATO-member countries do not have.



After weeks of fighting, Ukrainian soldiers have taken only two prisoners of war. In announcing the capture on Saturday, Ukrainian President Volodymyr Zelenskyy said taking them alive “was not easy” because of efforts to conceal the North Koreans’ presence and avoid their interrogation by Ukraine.

North Korean soldiers avoid surrendering at all costs, Mr. Zelenskyy said.

This may stem from North Korean internal propaganda that portrays capture as the ultimate disgrace, analysts said.

“To be captured alive is considered a betrayal of the country, the leader, and everything they stand for,” said Seongmin Lee of the New York-based Human Rights Foundation, who defected from North Korea in 2009. This belief is instilled from a young age and reinforced throughout military training, he said. “Because of the disgrace associated with the capitulation, heroic soldiers are supposed to save the last of their bullets to kill themselves,” Mr. Lee said. Mr. Lee said he shared photos of dead North Korean soldiers with contacts back home. “Most North Koreans do not even know what is going on,” he said.

Dorothy Camille Shea, the deputy U.S. Ambassador to the UN, warned of the dangers posed by the rapidly improving battlefield skills the North Korean troops are gaining.

As an added potential benefit, she said, North Korea “will likely be eager to leverage these improvements to promote weapons sales and military training contracts globally.”

BACK IN POWER WITH FEWER FRIENDS

More than 11 years after assuming power as Venezuela’s interim President following the death of popular leader Hugo Chavez, Nicolas Maduro has yet again been sworn as the President of the Latin American country. The circumstances of the retention of his post and the reactions to the ceremony from international actors provide a sense of deja vu.

In 2019, when Mr. Maduro was sworn in for the second time as President, nearly 40 countries including the U.S., neighbouring Colombia and Brazil and those belonging to the EU, refused to recognise his presidency. Sixteen UN-recognised countries sent representatives, including Bolivia, Cuba, Nicaragua and El Salvador.

In 2025, however, only two Presidents — Cuba’s Miguel Diaz-Canel and Nicaragua’s Daniel Ortega — attended. International condemnation of the manner in which Mr. Maduro was declared President after the elections held on July 28, 2024 has been more severe this time around. Since 2019, there has been a new Pink Tide in Latin America with countries such as Colombia, Brazil and Chile electing leftist Presidents. All three leaders have rejected Mr. Maduro’s “victory”.

Meanwhile, the Opposition candidate, Edmundo Gonzalez Urrutia, who exiled himself to Spain and had recently visited two countries ruled by the Right in Latin America — Argentina and Panama — withdrew plans to return to Caracas for his own “inauguration”.

The results in question and the process in which Mr. Maduro was declared the winner raise severe doubts about the Venezuelan elections in 2024. The UN, which sent a panel of experts to Caracas, criticised the National Election Council of Venezuela for declaring Mr. Maduro as the winner before providing detailed table-level results.



The electoral system consisted of an electronic voting machine which produced a paper receipt after voters registered their choice at the polling booth. At the end of polling, each machine would print a tally sheet showing the candidates' names and the votes that they received. The National Election Council traditionally put up only the vote counts at the end of the election on its website, but the site was down during the counting and after disputing the results, the Opposition demanded the release of the tally sheets which was not done.

The Opposition could, on its own, access 83% of the tally sheets from 30,026 polling stations, which "revealed" that Mr. Gonzalez polled 67% votes. The CNE's figures were different, favouring Mr. Maduro with 51.95% of the vote to Mr. Gonzalez's 43.2%.

Considering the wide differences on this issue and the fact that the Maduro regime had used intimidatory tactics throughout the election process, several international actors sought the release of the tally sheets to confirm the winner but that was not done.

Economic decline

The 11 years of rule by Mr. Maduro has coincided with a significant decline in Venezuela's economic standing, with severe increases in the poverty rate, persistently high inflation and food shortages in the country. While inflation had eased to 23.58% in October 2024, hyperinflation has characterised the economy since 2018.

As of October 2023, the UNHCR estimated that more than 7.7 million Venezuelan citizens fled the country to become refugees and 6.5 million among them (84%) are in Latin America and the Caribbean.

Critics of Mr. Maduro blame the catastrophic economic situation on the stark authoritarian turn since he came to power. Some suggest that the economic decline was inevitable as Venezuela was overly dependent upon the petroleum sector — crude constituted 95% of the country's exports in 2014 and the oil price crash in the same year sent it into a spiral.

Critics argue that the seeds of the economic decline were laid during Chavez's regime, as he tried to undo the remnants of the country's liberal democratic order to create a personalised state with concentrated powers for the executive presidency. The Chavistas instituted a series of measures, including constitutional referendums and structural changes, most of which received popular support as Chavez won several elections. The Chavistas argue that the regime enhanced grassroots participation in the polity and built cooperatives while using the proceeds of the extractive economy to fund pro-poor programmes. And while the regime was cognisant about diversification, the lack of it during the oil price crash resulted in the economic crisis, which was exacerbated by a series of economic sanctions imposed by the U.S. and the EU after Mr. Maduro came to power.

Since his ascent to power, Mr. Maduro's regime has moved away from a popular regime that was dependent upon grassroots mobilisation and participatory democracy to an authoritarian system.

The first Donald Trump administration in August 2017 imposed sanctions prohibiting the Venezuelan government from accessing U.S. financial markets, a move that affected Venezuela's state-run oil company, PDVSA. The U.S. went on, in 2019, to impose further and direct sanctions on PDVSA, preventing it from being paid for petroleum exports to the U.S, froze its U.S. assets and disallowed the supply of diluents that aided the refining of Venezuelan heavy crude, among other measures.



The U.S.-imposed economic sanctions were compounded by the EU's own embargo on arms and material to be traded with Venezuela, imposed in 2017. Restrictions still remain. The country got a respite when the U.S. eased some sanctions following an agreement signed between Mr. Maduro and representatives of Opposition parties in October 2023 in Barbados with political prisoners being released. The country's oil output saw an increase, resulting in more exports and a partial easing of the severity of the economic situation. However, in April 2024, the U.S. announced that sanctions would be reinstated on the oil sector.

International opprobrium

Just prior to the inauguration of his third term, the U.S. announced a \$65- million bounty for the arrest of Mr. Maduro even as he received support from Russia and China apart from staunch allies in Cuba and Nicaragua.

The international opprobrium and increased polarisation in Venezuela is not deterring Mr. Maduro from doubling down on authoritarianism. A proposed law — the Simon Bolivar law — now stipulates severe punishment for dissidents and repression of civil movements. With Mr. Trump returning to power in the U.S., hostilities are set to renew afresh and the biggest casualty could be the millions of Venezuelans pushed into poverty from a combination of poor economic policies, international sanctions and authoritarianism under Mr. Maduro.



DreamIAS



NATION

DHAKA SUMMONS INDIAN ENVOY OVER FENCING ROW

Bangladesh faced off with India Sunday over tensions at the border as the neighbouring country's foreign ministry summoned High Commissioner Pranay Verma to express "deep concern" over "recent activities of the Border Security Force (BSF)".

- This came hours after Dhaka alleged that India was attempting to construct fences at five locations along the Indo-Bangla border, violating a bilateral agreement.
- After meeting Bangladesh Foreign Secretary Jashim Uddin, the Indian High Commissioner said: "I just met Foreign Secretary to discuss India's commitment to ensuring a crime-free border, effectively addressing challenges of smuggling, movement of criminals and trafficking."
- "We have an understanding with regard to fencing the border for security. BSF and BGB (Border Guard Bangladesh) have been in communication in this regard. We expect that understandings will be implemented and there will be a cooperative approach to combating crime," Verma said in Dhaka.
- Earlier in the day, Bangladesh Home Affairs Adviser Lt Gen (retd.) Jahangir Alam Chowdhury said that India had halted the construction of barbed wire fencing along the border after strong opposition from the BGB and local residents.
- According to the Bangladesh Foreign Ministry, Jashim Uddin told the Indian envoy that the "unauthorized attempt" to construct fences and related operational actions by BSF have caused tensions along the border.

Do You Know:

- The chequered history of Bangladeshi democracy has seen periodic interventions by the military. The army appointed Chief Justice Abu Sadat Mohammad Sayem as president in November 1975, and the country was ruled by a military junta.
- In 1977, Gen Ziaur Rahman became president; he was assassinated in 1981 and his successor Abdus Sattar was removed in a coup in 1982. Army chief H M Ershad took control, but mass unrest led to his resignation in 1990.
- The civilian governments of Khaleda Zia, widow of Gen Ziaur Rahman (1991-96 and 2001-06), and Sheikh Hasina (1996-2001) followed. In between, there was an attempted coup in 1996.
- Following widespread unrest at the end of Khaleda's term in 2006, the military asked the then president to declare an emergency. A caretaker government was in charge from January 2007 to December 2008.
- After Hasina came back to power in 2008, she made sure that the army returned to the barracks. In 2010, the Supreme Court reduced the scope for military interventions through legal loopholes, and reaffirmed the secular principles of the Bangladesh constitution.



DOES 'BLOOD MONEY' HAVE A LEGAL STANDING?

The story so far:

The death sentence awarded by a Yemen court to nurse Nimisha Priya from Kerala for murdering her business partner, and the subsequent debates and efforts surrounding her acquittal and repatriation, which involves monetary compensation paid to the victim's family, have brought the focus back on 'blood money' and its implications.

What is 'blood money'?

'Blood money', or 'diya', finds footing in the Islamic Sharia law, and is followed in countries that incorporate these laws in their legislation. Under the rule of 'diya', a select quantity of a valuable asset, primarily monetary, has to be paid by the perpetrator of the crime to the victim, or the victim's family if the latter has died. The custom is practised predominantly in cases involving unintentional murder and culpable homicide. It is also invoked in murder cases wherein the victim's kin chooses not to retaliate through 'qisas' (a way of retribution under the Sharia). The end-goal, as the law says, is not to put a price tag on human life, but to alleviate the plight and suffering of the affected family and their potential loss of income. However, it is to be noted that even if the concerned parties reconcile through 'blood money', the community and the state will retain the right to impose a deterrent punishment, including penalties.

In its contemporary applications, 'blood money' is upheld in several Islamic countries with factors such as gender, religion and nationality of the victim coming into play. Islamic scholar-researcher Mohammad Hashim Kamali outlines several cases in his book *Crime and Punishment in Islamic Law: A Fresh Interpretation*. In Saudi Arabia, for instance, the traffic regulations specifically mandate payment of 'blood money' to heirs of the victims who die in road accidents. In addition, the perpetrator shall be liable to a prison term. The statutory legislation and the Sharia work hand in hand in such cases. While the police determine the guilty parties, a Sharia court fixes the amount of 'blood money' to be paid. As for accidents in workplaces, the rates are fixed by a special committee. In 2022, talks had surfaced that Saudi Arabia was on the course to amend its 'blood money' laws, proposing equal monetary payments for men, women, Muslims and non-Muslims alike. However, efforts towards this are yet to come to fruition.

In Iran too, a country where the practice is rigorously upheld, 'blood money' varies with respect to religion and gender. A woman's compensation is fixed at half of that of a man's. In 2019, the country's Supreme Court upheld a law that sought equalisation of 'blood money'. However, the country is yet to see its full-fledged implementation. India's neighbour Pakistan, too, provides a place for 'diya' and 'qisas'. Through the Criminal Laws (Amendment) Ordinance, 1991, these provisions were brought into mainstream law. In Yemen, the country in question, the consensus for compensation can be arrived at by the parties, and there might be a judicial oversight over the fairness of the compensation.

What's India's stand on 'diya'?

Provisions for the grant or receiving of 'blood money' do not find a place in India's formal legal system. However, the system does provide a way for the accused to negotiate with the prosecution through 'plea bargaining'.

Though the concept cannot be directly equated with 'blood money', the scheme lays out a procedure whereby the defendant agrees to plead guilty for a particular offence perpetrated by



the accused in return for a concession from the prosecutor. The concessions can be offered on a charge or a sentence. In the former, the defendant may plead guilty for one of the several charges or a less severe charge in return for dismissal of other charges, and in the latter, for a reduced sentence than what is prescribed for the concerned offence.

Introduced into legal parlance through the Criminal Law (Amendment) Act, 2005, which added Chapter XXI A to the Code of Criminal Procedure, 1973, plea bargaining comes with an array of limitations unlike 'blood money', which has a broader purview. For instance, plea bargaining can be taken up only for offences that are penalised with imprisonment of less than seven years. It cannot be invoked if the accused has been previously convicted for a similar offence. Besides, the provision is not available for crimes against women or children aged below 14; heinous crimes such as murder or rape; and offences involving socio-economic conditions, including civil rights. Moreover, the accused has to voluntarily come forward to plead guilty, and must not be coerced.

However, on the lines of 'blood money', plea bargaining may also allow for the victim to receive compensation under clause Section 265E. Besides, much like the efforts in Islamic nations towards making 'blood money' more inclusive and egalitarian, discussions have been under way to make plea bargaining more refined.

Though its use has been minimal in India, experts have pointed out that owing to judicial delays and prolonged trials, accused persons, even if innocent, may be pushed to a situation to plead guilty under the plea bargaining clause.

What are some historical practices which are similar to 'blood money'?

Striking similarities to 'diya' can be found in the historical records of several other cultures across the globe.

In the ancient legal system of Ireland, the Brehon law (seventh century AD) provided for the system of 'Éraic' (body price) and 'Log nEnech' (honour price). The law shunned the notion of capital punishment for crimes, and allowed resolution of matters through amicable payment. In Éraic, the amount was determined by the severity of the offence, while in Log nEnech, the price varied depending upon the victim's social status.

'Galanas' was an early Welsh law wherein the compensation was determined according to the status of the victim. Under the ruling, 'blood fine' was always to be paid, especially in cases of murder, barring where the killing was justified or excused owing to circumstances, points out author Thomas Peter Ellis in the book *Welsh Tribal Law and Customs in the Middle Ages*.

'Wergeld', a concept that is said to have been formalised in early medieval Germany, greatly resembles 'blood money'.

American legal professional Roscoe Pound's book, *The Ideal Element in Law* points out that, in fact, several medieval States had set their standards for an appropriate payment to the kin of victims in the event of homicide or grave crimes.

Have there been other Indians who were pardoned with 'blood money'?

While Nimisha Priya's case is in the spotlight now, there have been several other instances involving Indian nationals where 'blood money' had been invoked.



As recently as in 2019, the death sentence of Arjunan Athimuthu, hailing from Thanjavur, in Kuwait was commuted to life imprisonment after his family provided ₹30 lakh in 'blood money'. Abdul Rahim, who was sentenced to death for the murder of a Saudi boy in 2006, was pardoned by the court after a 'blood money' of ₹34 crore was paid. However, he is yet to be released from prison. Ten Indians in the UAE were "forgiven" by the victim's family in 2017 after a 'blood money' of 200,000 dirhams was paid. In another case, 17 Indians who were on death row in the UAE for the murder of a Pakistani national in 2009, were pardoned after a 'blood money' of nearly ₹4 crore in value equalling dirhams was paid. The Indian consulate had even hired a law firm in the UAE to argue the case.

As for Nimisha, with Iran assuring India of taking up the case, it remains to be seen whether her death sentence would be commuted.

PANNUN CASE: PANEL SEEKS ACTION AGAINST KEY PERSON

A high-powered inquiry committee — formed over a year ago based on information provided by the United States to probe the role of organised criminal groups, terrorist organisations, and drug peddlers — submitted its report to the Union government recommending expeditious legal action against an "individual", the Union Home Ministry said in a statement on Wednesday.

The Ministry did not identify the individual, but said the person's "earlier criminal links and antecedents" came to notice during the panel's inquiry.

Though the statement did not specify the details of the case, the United States Department of Justice in October 2024 charged Vikash Yadav, an Indian citizen and former Research and Analysis Wing (RAW) official, with directing a failed plot to murder the pro-Khalistan activist and Sikhs for Justice (SFJ) chief, Gurpatwant Singh Pannun, in New York in 2023. Mr. Pannun is a U.S. citizen designated a terrorist.

The identity of Mr. Yadav, who was only identified as 'CC-1' in U.S. court records, was disclosed in October 2024 when the Federal Bureau of Investigation (FBI) put him on its "most wanted" list. Mr. Yadav was arrested by the Delhi Police Special Cell in December 2023 in an unrelated kidnapping and extortion case. He was granted interim bail by a Delhi court in March 2024, and regular bail a month later.

The court order identified him as an "ex-government employee", indicating that he was no longer employed with the Central Reserve Police Force (CRPF). Mr. Yadav was on deputation to RAW when he was named by the U.S. authorities in the foiled assassination plot.

R.K. Handoo, Mr. Yadav's counsel, told *The Hindu* on Wednesday that his client continues to be on bail, and that the next hearing in the extortion case is expected in February.

The MHA said the inquiry panel was constituted in November 2023 to probe the role of organised gangs "who undermined the security interests of both India and the U.S."

"The enquiry committee conducted its own investigations, and also pursued leads provided by the U.S. side. It received full cooperation from U.S. authorities and the two sides also exchanged visits. The committee further examined a number of officials from different agencies and also scrutinised relevant documents in this connection," it said.



“After a long enquiry, the committee has submitted its report to the Government and recommended legal action against an individual, whose earlier criminal links and antecedents also came to notice during the enquiry,” MHA said adding that the committee has recommended that the legal action must be completed expeditiously.

The Ministry of External Affairs (MEA) had said in November 2023 that the government would look into all relevant aspects of the matter.

INDONESIAN PRESIDENT TO BE CHIEF GUEST ON REPUBLIC DAY

Indonesian President Prabowo Subianto will be the chief guest at the Republic Day Parade this year, with the Indonesian Army bringing the largest foreign contingent so far to march down Kartavya Path alongside India’s military.

The visit on January 25 and 26, announced by New Delhi and Jakarta simultaneously, will make Mr. Prabowo the fourth Indonesian President to be invited as the chief guest on Republic Day.

According to sources, the two countries are also close to concluding a \$450-million deal for the BrahMos supersonic cruise missile systems, which will make Indonesia the second export customer for the Indo-Russian system. An announcement of the deal is expected during the visit.

Sources confirmed that Indonesia’s Defence Ministry has officially sent a request to the Indian Embassy in Jakarta over the proposed deal on BrahMos, which was earlier procured by the Philippines. The request is now being processed by the Defence Ministry for a detailed response, the sources said. Indonesia has expressed interest in procuring other Indian military platforms such as the Dhruv advanced light helicopters and the Akash air defence systems. Mr. Prabowo, who was the Defence Minister of Indonesia under President Joko Widodo, was sworn in as President in October 2024.

Friendly relations

“India and Indonesia share warm and friendly ties spanning over millennia. As a Comprehensive Strategic Partner, Indonesia is an important pillar in India’s Act East Policy and our vision of the Indo-Pacific,” said the Ministry of External Affairs in a statement announcing the visit. “President Prabowo and Prime Minister Narendra Modi will witness the exchange of a number of memoranda of understanding between the governments of the two countries in various sectors, including health, culture, education, maritime security and safety, traditional medicine, which aim to strengthen cooperation between the two countries,” the Indonesian Ministry of Foreign Affairs said in a statement on Thursday.

“The visit of the Indonesian President to India confirms the strengthening and expansion of strategic cooperation between Indonesia and India, especially in the economic, defence and maritime sectors,” it added, disclosing that Mr. Prabowo would be accompanied by a 352-member military contingent that would march down the parade route. The massive Army contingent, the largest foreign contingent so far, has been practising for the event for several months, officials said, and will include 152 marching troops and 189 cadets from the military bands with both men and women.

According to the official programme, Mr. Prabowo will pay his respects to Mahatma Gandhi at Rajghat and receive a ceremonial welcome at the Rashtrapati Bhavan forecourt on January 25,



followed by a bilateral meeting with Mr. Modi at Hyderabad House. He will go to the parade on January 26 and attend the “At Home” tea hosted by President Droupadi Murmu before leaving.

SINGAPORE PRESIDENT SAYS TIES WITH INDIA ON ‘NEW TRAJECTORY’

India and Singapore are cooperating in critical sectors like advanced manufacturing and semiconductors as the relations are on a “new trajectory” of growth, Singapore President Tharman Shanmugaratnam said Thursday.

- Shanmugaratnam, on a five-day visit to India, held separate talks with President Droupadi Murmu and Prime Minister Narendra Modi with a broad focus on expansion of bilateral ties. He is travelling to Odisha Friday where he will meet the state government’s leadership.
- The Singapore President told reporters that a data corridor between the GIFT City in Gujarat and his country is being explored so that the financial institutions of the two sides can safely exchange data.
- Talking about Singapore-India ties in the last few decades, he said the two countries are now on a new trajectory after ties were upgraded to a comprehensive strategic partnership during Modi’s visit to the city state in September last year.
- The Singapore president also referred to how India was among the first to recognise his country around six decades ago.
- The year 2025 marks the celebrations of the 60th anniversary of establishment of diplomatic relations between India and Singapore.
- To commemorate this occasion, Murmu and Shanmugaratnam unveiled a joint logo.
- The joint logo incorporates elements: colours from the Indian and Singaporean National flags, the Lotus (national flower of India) and Orchid (national flower of Singapore), and the number 60 highlighting the significant milestone of the 60th anniversary.

Do You Know:

- Singapore has a well-developed semiconductor industry, the outcome of an early start and the vision of its first Prime Minister Lee Kuan Yew.
 - By the early 1980s, the electronics industry was already accounting for 7% of Singapore’s GNP and a quarter of its manufacturing jobs, Miller notes.
 - Today, Singapore contributes around 10% of the global semiconductor output, along with 5% of the global wafer fabrication capacity (silicon wafer is a circular piece of ultra pure silicon, usually 8-12 inches in diameter, out of which chips are carved) and 20% of semiconductor equipment production.
- Nine of the world’s top 15 semiconductor firms have set up shop in Singapore, and the semiconductor sector contributes significantly to the country’s economic growth.
- Singapore has players in all segments of the semiconductor value chain: integrated circuit (IC) design, assembly, packaging and testing; wafer fabrication, and equipment/ raw material production.



- The Comprehensive Economic Cooperation Agreement (CECA) is a free trade pact between Singapore and India aimed at boosting bilateral trade, signed on June 29, 2005.
- The CECA also fostered cooperation in areas such as education, science and technology, intellectual property, aviation, information technology, and finance. Singapore has contributed to infrastructure development in India by investing in projects like upgrading ports, airports, IT parks, and establishing a Special Economic Zone (SEZ).
- India has emerged as Singapore's fourth-largest tourist destination, with over 650,000 Indians visiting Singapore in 2006. Both countries have collaborated in aviation, aerospace engineering, space programs, IT, biotechnology, and energy sectors.

THE RED FLAG AS CHINA'S EXPANSIONIST STRATEGY ROLLS ON

In recent days, India has witnessed two significant incidents of Chinese aggression along the China-India border, highlighting vulnerabilities that not only threaten India's territorial integrity but also undermine its sovereignty. The Chinese government's announcement of the construction of a dam on the Yarlung Zangbo river (which is the Brahmaputra river), and the creation of two new counties in north-eastern Ladakh, have set alarm bells ringing.

India has strongly condemned these Chinese actions, asserting that they are illegal and a direct challenge to India's sovereignty. In response to China's ambitious hydropower project, India has expressed concern, noting that it is monitoring the situation and will take necessary measures to safeguard its national interests. These developments are particularly disturbing given the recent consensus on troop disengagement along the Line of Actual Control (LAC). These new moves further underscore the unpredictability of China's approach in the region.

The transboundary water issue

India is not alone in facing the brunt of China's expansionist policies. Other South Asian countries such as Nepal and Bhutan have been subjected in a similar manner to Chinese territorial encroachments. Disputes over land boundaries persist between China and several of its South Asian neighbours, and China's unilateral actions with respect to transboundary rivers, particularly the Brahmaputra and Indus river systems, have the potential to jeopardise water security in India, Nepal, Bangladesh, Bhutan, and Pakistan. Despite these challenges, each country has opted to engage with China on a bilateral basis.

The proposed Chinese dam, with an annual capacity to generate 300 billion kilowatt-hours of electricity a year, is located on the lower reaches of the Yarlung Zangbo near the China-India border. This massive infrastructure project presents significant challenges for downstream countries, particularly India and Bangladesh.

The construction of the dam is likely to reduce the amount of water and silt reaching downstream, which could have severe long-term consequences for agriculture, fisheries, and biodiversity in India and Bangladesh. Further, during the monsoon season or in times of geopolitical tensions, the uncontrolled release of water could result in devastating floods along the Indian border, which will be an issue of strategic vulnerability for India. In anticipation, India has accelerated plans to build its own hydropower projects and reservoirs, including an investment of \$1 billion to expedite the construction of 12 hydropower stations in Arunachal Pradesh.



Border disputes, cartographic aggression

China's recent actions, including the creation of the two new counties, are a part of its ongoing strategy of cartographic aggression aimed at asserting control over disputed territories. This kind of tactic is intended to gain strategic leverage over its regional adversaries.

China's territorial disputes with India are multifaceted, with the most recent aggression occurring along the western front, specifically in Ladakh. Additionally, China continues to lay claim to Arunachal Pradesh, a State that is an inalienable part of India. Beyond India, China also asserts overlapping claims on territories in countries such as Nepal and Bhutan.

China's tactics in asserting territorial claims— such as renaming locations within Indian-controlled territories, establishing settlements in disputed areas, and incorporating contested regions into official maps — are becoming increasingly visible. For instance, in 2023, the Chinese government standardised 11 locations in Arunachal Pradesh to assert its ownership, following similar actions in 2021 and 2017.

However, international law does not recognise territorial claims based solely on cartographic assertions. In various landmark cases, which include the ruling by the International Court of Justice (ICJ) on the Minquiers and Ecrehos dispute between the United Kingdom and France, maps were deemed insufficient evidence of sovereignty. The ICJ ruled that effective administrative control and sovereignty are crucial for determining ownership of contested territories. Therefore, China's use of cartographic aggression, while provocative, lacks legal validity under international law. Nevertheless, China's efforts to establish a physical presence in disputed territories, such as by building settlements, could complicate matters for India in the future.

The South Asian response

While China has sought economic engagement with all South Asian nations, its territorial and water-related disputes with these countries continue to strain regional relations. Unlike the Southeast Asian nations, which have employed collective responsive measures through multilateral organisations such as the Mekong River Commission (MRC) and the Association of Southeast Asian Nations (ASEAN), South Asian countries, including India, have chosen to address their concerns with China on a bilateral basis. This approach has largely been shaped by the power asymmetry between China and its smaller neighbours.

India, as the dominant regional power in South Asia, should take the lead in fostering a collective response to China's actions. A unified approach, including regional forums, multilateral institutions, or enhanced diplomatic coordination would strengthen South Asia's position in addressing China's increasing influence and territorial ambitions. A comprehensive strategy involving diplomatic engagement and regional cooperation is crucial for India's sovereignty and regional security in the face of China's growing assertiveness.

NUCLEAR DEAL: INDIA HAILS LIFTING OF US CURBS ON THREE ENTITIES

India Friday welcomed the US move to lift restrictions on three Indian nuclear entities, saying the move will open new avenues for collaboration in the civil nuclear field.

- The US had Wednesday removed restrictions on Bhabha Atomic Research Centre (BARC), Indira Gandhi Atomic Research Centre (IGCAR) and Indian Rare Earths (IRE).



- The decision came over a week after NSA Jake Sullivan announced that Washington was finalising steps to “remove” hurdles for civil nuclear partnership between Indian and American firms.
- “These (BARC, IGCAR and IRE) were in the entity list of the US for several years now. With this action by the US government, it will lead to greater collaboration between India and the US in the field of nuclear energy and also in the field of critical minerals,” he said.
- Certain clauses in India’s nuclear liability norms have emerged as hurdles in moving forward in implementation of the historic India-US civil nuclear deal that was firmed up around 16 years back.
- The removal of restrictions on the three key Indian entities is being seen as an attempt by the outgoing Biden administration to facilitate the implementation of the landmark India-US civil nuclear pact.
- India and the US unveiled an ambitious plan to co-operate in civil nuclear energy in July 2005 following then Prime Minister Manmohan Singh’s meeting with American President George W Bush.

Do You Know:

- On the American side, a significant impediment is the ‘10CFR810’ authorisation (Part 810 of Title 10, Code of Federal Regulations (Part 810) of the US Atomic Energy Act of 1954), which gives US nuclear vendors the ability to export equipment to countries such as India under some strict safeguards, but does not permit them to manufacture any nuclear equipment or perform any nuclear design work here.
- This authorisation is a clear impediment from New Delhi’s perspective, which wants to participate in the manufacturing value chain and co-produce the nuclear components for atomic power projects being jointly planned to be set up in India, sources said.
- On the Indian side, the Civil Liability for Nuclear Damage Act, 2010, which sought to create a mechanism for compensating victims from damage caused by a nuclear accident, and allocating liability and specifying procedures for compensation, has been cited as an impediment by foreign players such as GE-Hitachi, Westinghouse and French nuclear company Areva (now called Orano).
- This is primarily on the grounds that the legislation channelises operators’ liability to equipment suppliers with foreign vendors citing this as a reason for worries about investing in India’s nuclear sector due to fear of incurring future liability.
- A breakthrough agreement on iCET that addresses the concerns on both sides could pave the way for plans to jointly manufacture nuclear components for any new project capacity being planned for India by deploying American atomic reactors.
- This also comes when India is hoping to pitch itself as a credible destination to manufacture nuclear reactors, especially small modular reactors or SMRs that have a capacity of between 30MWe and 300 MWe, cost-effectively and at scale.
- Though India’s civil nuclear programme has expertise in manufacturing smaller reactor types — 220MWe PHWRs (pressurised heavy water reactors) and above – the problem for India is its reactor technology. Based on heavy water and natural uranium, the PHWRs are increasingly out



of sync with light water reactors (LWR) that are now the most dominant reactor type across the world.

AT LEAST 126 INDIANS JOINED RUSSIAN FORCES; 12 KILLED, 16 FEARED MISSING, SAYS MEA

The government is aware of at least 126 cases of Indians who joined the Russian Army to fight in the war in Ukraine, the Ministry of External Affairs (MEA) said on Friday, indicating their numbers continue to rise despite efforts to stop them.

According to the latest figures released, of the 126 Indian men that the Indian Embassy in Moscow has been intimated about, 96 have returned to India thus far. Of the remainder, 12 have been killed in the conflict, including one from Kerala, who died last week, and one is being treated for injuries at a hospital in Moscow. As many as 16 are believed to be “missing”, as officials said they could not be traced at present.

“Their whereabouts are not known, and the Russian side has categorised them as missing,” said MEA spokesperson Randhir Jaiswal, detailing the figures. “We remain engaged with the Russian authorities to ascertain the whereabouts of the missing Indian nationals, as also seeking early release and repatriation of those who remain,” he added.

On the two most recent casualties, Mr. Jaiswal said that the Indian embassy officials were in touch with Russian authorities to ensure that the mortal remains of Binil Babu, a 32-year-old from Thrissur district in Kerala who succumbed to injuries from a drone attack last week, are brought back to India at the earliest. Before he died, Mr. Babu was reportedly in contact with the Embassy, and had wanted to return home. His cousin Jain Kurian, 27, is being treated for his injuries, and the MEA said that he would return to India after his discharge from hospital.

The government’s acceptance of the latest figure of 12 deaths indicates that there may have been more Indian casualties in the past few months, despite persistent efforts, including during two meetings between Prime Minister Narendra Modi and Russian President Vladimir Putin, to resolve the issue.

In August last year, External Affairs Minister S. Jaishankar told Parliament that of the 91 Indians known to have been recruited, eight had been killed, and India was seeking the military discharge and return of 69 Indians from the conflict zone. In December, in written responses to parliamentary questions, the MEA further updated the House that “19 Indians now remained in the Russian armed forces”.

In touch with families

The latest information, that the Russian forces have categorised 16 of them as “missing”, is particularly worrying for their family members belonging to a number of States, including Punjab, Haryana, Uttar Pradesh, Kerala, and Jammu and Kashmir. Officials said the government was in touch with the families, and had compiled the numbers based on those who had reached out to the MEA or the Indian Embassy in Moscow. Many said they had been “lured” into joining the Russian military and promised high salaries as well as a path to Russian citizenship for their service, and were not being granted permission to leave, which India had raised with Russian officials.



It is unclear how many others might be in the Russia-Ukraine conflict zone, who haven't reached out to the government to be repatriated back to India. When asked, an official told *The Hindu* that the figure of 126 was likely to represent "the total" number of recruits. *The Hindu* had been the first to report on the cases of Indians joining the Russian Army in February 2024.

INDIANS ABROAD

At the inauguration of the 18th edition of the Pravasi Bharatiya Divas (PBD) last week, Prime Minister Narendra Modi described the Indian diaspora as India's "ambassadors to the world", having "seamlessly assimilated" into the local society, served the community, and contributed to India's growth and prosperity. The strength of the India-origin community worldwide of over 35 million — about 15.85 million NRIs and 19.57 million PIOs, who are foreign nationals — is their ability to adapt and thrive in different fields, including in politics, where Indian-origin people have become leaders of more than 30 other countries. Where they retain their Indian passports, the diaspora is known for its distinguished services in many professional spheres. The PBD's purpose is to celebrate this success and discuss issues of importance; President Droupadi Murmu handed out about 27 Pravasi Bharatiya Samman awards. The event, which was first held in 2003, is organised around January 9, when Mahatma Gandhi returned to India from South Africa in 1915. The latest event, held in Bhubaneswar, Odisha, brought more than 3,000 delegates from across 70 countries, with much of the focus on how the diaspora can help in developing India (Viksit Bharat programme).

The achievements of the Indian diaspora are, no doubt, a matter of pride for all Indians, but it is important that the event is not limited to a simple self-congratulatory or laudatory exercise. The issues for the diaspora, particularly for those who are still Indian nationals, are more acute now. The increase in far-right populist governments, particularly in the West, is making visa and entry conditions for Indians more difficult, and it is important for the government to address such issues. Intractable global conflicts, especially in West Asia where more than nine million Indians live and work, are also putting lakhs of Indians in peril, and the PBD engagement would benefit from discussions between the community on how best to increase awareness and enhance safeguards for them. Given the broad spread of the diaspora, it is necessary to ensure that India's ties with its diaspora be inclusive, and non-partisan on political issues. Recent actions by the government to deny or revoke OCI cards for those perceived to be critical of the government bely this necessity. Above all, it is important to acknowledge that one of the biggest drivers of Indians migrating is the lack of economic opportunities within India. While there are no easy fixes for this, the loss to India of some of its most talented people must be counted, even as the country celebrates their incredible success and impact on the global stage.

HOW FTI-TTP WILL ENSURE FASTER, SMOOTHER IMMIGRATION CLEARANCE

Union Home Minister Amit Shah will inaugurate the Fast Track Immigration – Trusted Traveller Programme (FTI-TTP) at Mumbai, Chennai, Kolkata, Bengaluru, Hyderabad, Cochin and Ahmedabad airports on Thursday (January 16) from Ahmedabad. This comes seven months after the FTI-TTP was launched at the Indira Gandhi International (IGI) Airport in New Delhi.

- According to the government, it is aimed at making international travel easy and secure. World-class immigration facilities will be developed through an accelerated immigration pathway for international travellers, who will be screened through automated gates.



- In the initial phase, it was for Indian nationals and OCI cardholders on a gratis basis, that is, free of cost for all passengers. The Bureau of Immigration under the Ministry of Home Affairs is the nodal agency for programme implementation.

- FTI-TTP has been implemented through an online portal (<https://ftittp.mha.gov.in>). To enrol in the programme, the applicant has to register online by filling in their details and uploading the required documents. After necessary verification, a white list of 'Trusted Travellers' will be generated and fed for implementation through e-gates.

Do You Know:

- FTI-TTP is one of the key agendas set by the Centre for 'Viksit Bharat @2047' – India becoming a developed nation by the centenary of its independence.

It was first deployed in June 2024 at Terminal 3 of the IGI Airport to facilitate international mobility with faster, smoother and more secure immigration clearance for Indian Nationals and Overseas Citizens of India (OCI) passengers arriving from other countries.

PMLA: SC PULLS UP ED FOR SAYING RIGOURS OF BAIL APPLY TO WOMEN

Irked by the Enforcement Directorate's submission that the rigours of getting bail in cases under the Prevention of Money Laundering Act (PMLA) would apply equally to women accused, the Supreme Court on Wednesday cautioned that it "will not tolerate" submissions contrary to the law.

- "We will not tolerate conduct on the part of the Union of India to make submissions contrary to statute," a bench of Justice A S Oka and Justice Ujjal Bhuyan said while hearing a bail plea filed by Shashi Bala, arrested by the ED in connection with an investigation allegedly involving the Lucknow-based Shine City Group of companies.

- What annoyed the bench about the submission was that it went against the spirit of PMLA section 45(1), which allows courts to exempt women accused from the rigours of the bail clause.

- On December 20, 2024, the court expressed its displeasure over the ED counsel's submission that the bail clause would apply equally to women without any exception.

- On Wednesday, Solicitor-General Tushar Mehta apologised to the court for the submission and said the "confusion" happened due to some "miscommunication". He added that all that was sought to be argued was that the accused woman was the kingpin of the money-laundering operation, which defrauded hundreds of investors out of crores of their life savings and therefore should not be granted bail.

Do You Know:

- In Nikesht Tarachand Shah vs Union of India (2017), the two-judge bench of Justices Rohinton Nariman and Sanjay Kishan Kaul, had declared the 'twin test' of bail under PMLA as unconstitutional since it was manifestly arbitrary.

- Before application of a section which makes drastic inroads into the fundamental right of personal liberty guaranteed by Article 21 of the Constitution of India, we must be doubly sure that such provision furthers a compelling State interest for tackling serious crime. Absent any such compelling State interest, the indiscriminate application of the provisions of Section 45 will



certainly violate Article 21 of the Constitution. Provisions akin to Section 45 have only been upheld on the ground that there is a compelling State interest in tackling crimes of an extremely heinous nature,” the bench had said.

- It had said that stringent bail conditions can be imposed in exceptional circumstances such as anti-terrorism laws, but cannot be manifestly arbitrary.
- It also expounded the theory of “soft state” which the Court said is used to “describe a nation which is not capable of preventing the offence of money laundering”. The Court relied on Article 39 of the Constitution, part of the Directive Principles of State Policy that mandates the State to prevent concentration of wealth, to uphold the stringent bail conditions under PMLA.

SC STAYS HC ORDER ASKING DELHI GOVT. TO SIGN HEALTH SCHEME MOU WITH CENTRE

The Supreme Court on Friday stayed a Delhi High Court order to the Aam Aadmi Party (AAP) government in the Capital to enter into a Memorandum of Understanding (MoU) with the Centre for implementing the PM-Ayushman Bharat Health Infrastructure Mission (PM-ABHIM) scheme.

A Bench headed by Justice B.R. Gavai issued a notice to the Centre on the Delhi government plea against the High Court’s direction in December last year to sign the MoU by January 5.

Responding to the development, AAP national convener and former Delhi Chief Minister Arvind Kejriwal expressed happiness with the stay on the implementation of, what he alleged to be, the country’s “biggest scam”.

Hitting back, BJP national president J.P. Nadda said his party will implement the health scheme in the national capital upon winning the February 5 Delhi Assembly election.

‘Policy matter’

Appearing before the apex court for the Delhi government, senior advocate A.M. Singhvi asked how the High Court could compel his client to sign the MoU given that it is a policy matter.

“The powers of the Union government in the Capital are restricted to subjects one, two, and 18 of the State List [public order, police, and land]... The High Court has redefined the powers to include the health sector too,” he submitted.

Mr. Singhvi said that under the scheme, the Centre would bear 60% of the capital expenditure but not the running expenses. He added that the Delhi government’s health scheme has “a far wider” coverage.

The High Court had in December 2024 concluded that the PM-ABHIM would have to be implemented “in its entirety” to ensure that the national capital’s residents are not deprived of the funds and facilities under it. It had added that there was “no reason” to withhold the programme in the city, given that it is being implemented in other States and Union Territories.

War of words

Addressing a press conference on Friday, Mr. Kejriwal said, “Ayushman Bharat is the biggest scam in the country. When the BJP loses power at the Centre, and an inquiry is conducted, people will realise how big a scam Ayushman Bharat truly was.”



Leading the counter-attack, Mr. Nadda called Delhi's Mohalla Clinics "dens of corruption" and said that the party "plans to investigate fraudulent lab tests, scams worth ₹3 billion, and ₹1 billion worth of medicines distributed to close associates of the Chief Minister".

SHOULD VOTER IDS BE LINKED WITH AADHAAR?

The story so far:

The Aam Aadmi Party (AAP) and the Bharatiya Janata Party (BJP) have accused each other of manipulating electoral rolls before the Delhi Assembly elections. This has reignited the debate about linking voter IDs/Election Photo Identity Card (EPIC) with respective Aadhaar numbers.

What is the history of the proposal?

The Election Commission (EC) had in February 2015 launched the National Electoral Rolls Purification and Authentication Program (NERPAP). This was to address the issue of duplicate entries in the electoral roll and to remove such entries. In order to achieve this, the EC began authenticating EPIC data by linking it with the Aadhaar database. It had linked more than 300 million voters in a span of three months. However, the Supreme Court in an interim order, in August 2015, held that the mandatory use of Aadhaar should only be for welfare schemes and PAN linking. Following this order, the NERPAP exercise was discontinued.

After the Supreme Court's final order in *Puttaswamy* in September 2018, that upheld the constitutional validity of the Aadhaar Act, the EC sought amendments to the Representation of the People Act, 1950 (RP Act, 1950). The Parliament amended the RP Act, 1950 and The Registration of Electors Rules, 1960 in December 2021 to enable the linking of EPIC with Aadhaar. It provided the format in which Aadhaar information may be submitted to the electoral registration officer by a new voter at the time of fresh registration (Form 6: to establish identity) or an existing voter already included in the electoral roll (Form 6B: for the purpose of authentication). Any other listed document may be submitted only if the voter is unable to furnish their Aadhaar number because they do not have one. However, in order to keep these amendments voluntary in nature, the word 'may' have been used in the amendments. Further, the amendment also specifies that no application for inclusion of name in the electoral roll shall be denied and no entries shall be deleted due to the inability of an individual to furnish or intimate the Aadhaar number due to 'sufficient cause.'

Such individuals may furnish alternate documents like PAN card, Driving Licence, Passport, Bank passbook etc. While the above amendments were challenged in the Supreme Court, the EC in September 2023 informed the court that submission of the Aadhaar number is not mandatory. It added that it is looking into issuing appropriate clarificatory changes in the forms introduced for this purpose. However, it may be noted that Form 6 and 6B have not been amended till date and they continue to seek the same details as before from the applicants.

The forms require the voters to declare that they do not have an Aadhaar number to avoid providing the same.

What are the pros and cons?

EPIC linkage with the respective Aadhaar number would definitely help in weeding out duplicate entries; that is essential. At present, more than 650 million Aadhaar numbers have already been



uploaded in the process of finalising the electoral rolls. However, there are some concerns about this exercise that need to be considered.

Firstly, the errors in the Aadhaar database, however miniscule, may result in wrongful rejection or deletion of entries from the electoral roll. Secondly, Aadhaar is only a proof of residence and not a proof of citizenship. Thus, it may not help in removing voters who are not citizens from the electoral roll. It would require a separate effort from the EC.

Finally, while the linkage is to happen at the back end and a mere mention of the Aadhaar number on the EPIC/electoral roll may not by itself be a violation of right to privacy, it may still result in misuse as the electoral rolls are widely circulated amongst political parties.

What can be the way forward?

The right to vote is a constitutional right and declared so by the Supreme Court in various cases. It is part of the basic structure of free and fair elections and cannot be constricted through legislative action. Citizens are the most important stakeholders in a democracy and any electoral process should gain their confidence. There must be wide publicity about the benefits of linking EPIC and Aadhaar to clean up the electoral roll of duplicate entries, which in turn strengthens the electoral process. Any misplaced concern amongst voters about the secrecy of their vote being compromised because of this linking should be assuaged.

Meanwhile, the forms should be suitably modified without any delay, to reflect that providing Aadhaar is not mandatory, as per the submission of the EC in the Supreme Court in September 2023.

LOKPAL ORDERED PROBE IN 24 CASES IN FIVE YEARS, GAVE PROSECUTION SANCTION IN SIX

Twelve years since the Lokpal Act was passed and five years after the Lokpal — the country's first anti-corruption body — started to function, it has ordered investigation in just 24 cases and granted prosecution sanction in six cases, data show.

The Lokpal, which has the powers to investigate complaints against public functionaries, received three complaints against Prime Minister Narendra Modi in October and December last year.

The Lokpal has rejected a large number of complaints, nearly 90%, over the past five years as they were not in the correct format. At least 2,320 “defect-free” complaints were registered with the Lokpal in five years, with 226 complaints lodged from April 1 to December 2024.

3% against PM, MP

Of the total complaints, 3% were against the Prime Minister, Member of Parliament or Union Minister, 21% complaints were against Group A, B, C, or D officials of the Union government, 35% complaints against chairperson or members in Central government bodies, and 41% were against those in the “Others” category, which includes State government officials.

Though the Lokpal Act was passed in 2013, the country's first Lokpal, Justice Pinaki Chandra Ghosh, was appointed on March 19, 2019, along with eight other members. Justice Ghosh moved out of office in May 2022 after attaining 70 years of age.

Justice A.M. Khanwilkar (retd) was appointed the second Lokpal in March 2024.



To improve the efficiency of the anti-corruption body, the authorities are looking at restructuring the workforce by recruiting permanent staff to replace the temporary employees brought in during the transitional period, said an official.

The Lokpal awaits decision on proposals sent to the Centre on several occasions for filling up the post of the Director of Inquiry and the Director of Prosecution. In the meanwhile, preliminary inquiries and investigations are being entrusted with the Central Vigilance Commission (CVC) and the Central Bureau of Investigation (CBI) as mandated, the official added.

According to Section 11 A of the CVC Act, 2003, a Director of Inquiry, not below the rank of Joint Secretary, ought to be appointed in the CVC by the Central government for conducting preliminary inquiries referred to it by the Lokpal. However, presently, in the absence of a Director of Inquiry, the cases referred by the Lokpal are being inquired into with the aid of Central Vigilance Officers (CVO) of the Ministries or organisations concerned.

OYO'S NEW POLICY MAY BE AT THE COST OF RIGHTS

Payal Kapadia's award-winning film *All We Imagine As Light* depicts the journey of a young couple, Anu and Shiaz, struggling to find a private space. They may be fictional, but their problem certainly is not. Across the country, young people in pre-marital relationships have long found it difficult to come by privacy. This issue is likely to be exacerbated by policies such as the one recently implemented by OYO.

Last week, OYO announced that unmarried couples would be disallowed from accessing its partner hotels. The hotels have been given the discretion to implement this policy in accordance with local sensibilities. Going forward, all couples will be required to present 'valid proof of relationship' while checking in. Explaining the reason for its move, OYO stated that civil society groups and citizens had requested it to institute this rule.

Initially, the policy will apply only to hotels in Meerut, Uttar Pradesh, but reports suggest that OYO may expand its application to other cities. Beyond the practicalities of providing 'valid proof of relationship,' it is clear that OYO is encouraging partner hotels to discriminate against customers based on their marital status. The burning question, however, is whether those adversely affected by this policy may find legal redress either in the Constitution or otherwise.

In various decisions, the Supreme Court has recognised individuals' right to enter pre-marital relationships. In *Shafin Jahan vs Asokan K.M.* (2020), the court held that Article 21 of the Constitution includes the right of individuals to choose their partners 'whether within or outside marriage'. Similarly, in *Navtej Singh Johar vs Union of India* (2018), the court recognised the right of all individuals to physical, emotional, mental, and sexual companionship. Other decisions of the apex court have affirmed that the rights to privacy, dignity, and autonomy — emanating from Article 21 — mean that people have the freedom to engage in consensual, intimate, or sexual relationships and to cohabit with their partners if they choose. At their core, these decisions acknowledge the freedom to conduct oneself in a manner of one's choosing. For many unmarried couples, accessing hotel services is one way to exercise these rights. Individuals in pre-marital relationships apart, persons of different genders who are friends, colleagues, or cousins may also travel together and require OYO's services.

Under the constitutional scheme, fundamental rights enshrined in Part III of the Constitution are ordinarily enforceable against the State and its instrumentalities, not against non-State actors. In



other words, citizens may seek constitutional remedies from courts when the State infringes upon their fundamental rights but not when a private party hinders their exercise. This is because constitutional rights are generally thought to apply “vertically” (i.e., against the State) and not “horizontally” (i.e., between private individuals or entities).

However, the Constitution contains three express provisions which depart from the traditional “vertical” model of rights: Article 15(2) stipulates that no citizen shall, on grounds only of religion, race, caste, sex, place of birth, or any of them, be prevented from accessing shops, public restaurants, hotels and places of public entertainment or using wells, tanks, bathing ghats, roads, and places of public resort funded by the State or dedicated to public use; Article 17 forbids the practice of untouchability; and Article 23 prohibits human trafficking and forced labour. In *Kaushal Kishor vs State of Uttar Pradesh* (2023), the Supreme Court travelled beyond this schema of horizontal rights by holding that the right under Article 21 could be enforced even against private parties.

While Article 15(2) would prevent OYO from denying its services to customers based on caste, religion, or the other grounds listed, it may not readily constitute a bar against discrimination on the ground of marital status. Separately, the effect of the decision in the Kaushal Kishor case remains to be seen — commentators have criticised it for being unclear, and in the absence of coherent and consistent jurisprudence on this subject, it is uncertain whether unmarried individuals can enforce their rights under Article 21 against OYO.

Apart from constitutional rights and remedies, statutes may provide a model for the exercise of fundamental rights in transactions between private parties. While some enactments confer certain rights on women irrespective of marital status, the time may have come for lawmakers to enact an anti-discrimination law which protects individuals (regardless of their gender) against discrimination based on marital status, in the private sphere.

The full and free exercise of our rights as citizens depends not only on State (in) action but on private actors — be it as a member of the public, a family unit, a business undertaking, or a corporation — creating the conditions for their exercise. This applies not only in the context of individuals in pre-marital relationships who may seek commercial services but also more broadly, say, to people who may wish to rent homes, who apply for employment in private establishments, or who make offers to purchase land — but are denied access on the basis of their marital status, caste, religion, sexual orientation, gender identity, or other attributes.

The tyranny of the majority is often nowhere as evident as in the private sphere. An act may not meet with social approval but the Constitution guarantees our right to do it anyway. The law — regardless of the form it takes — must protect this right.

EXPRESS VIEW ON MOHAN BHAGWAT’S ‘GHAR WAPASI’ COMMENT

Adivasis have long been a contested constituency in India’s polity. The comments by RSS Sarsanghchalak Mohan Bhagwat — he claimed that Pranab Mukherjee, while he was president, said that had it not been for the Sangh’s work on “ghar wapsi” or reconversion, the Adivasis could have become “anti-national” — adds to an already fraught discussion and politics. Evoking Mukherjee’s name, a week after the BJP-led Centre decided to earmark a designated site in the Rashtriya Smriti complex for his memorial — Bhagwat’s comments underline the BJP attempt to twist the knife into Congress by appropriating Mukherjee. Bhagwat’s comments could also be read



as a bid to put Congress in a spot on the question of “ghar wapsi”, given that its ally, JMM, stands against the Sangh Parivar’s efforts to integrate Adivasis into the broader Hindu fold.

Since Independence, the RSS has made concerted attempts to make inroads into Adivasi-dominated regions. In 1952, it founded the first Vanvasi Kalyan Ashram at Jashpur in Chhattisgarh; by the 1970s, there were branches across Chhota Nagpur and Chhattisgarh. Besides providing medical and educational support to the Adivasis, whom it calls “Vanavasi” (forest dwellers), the Ashram has reportedly worked against their conversion to Christianity. In the last few years, the BJP has further strengthened its tribal outreach. In 2021, it marked November 15, the birthday of Birsa Munda, as the Janjatiya Gaurav Divas. In 2023, Narendra Modi became the first PM to visit Munda’s village Ulihatu. He announced projects worth Rs 24,000 crore for the development of Particularly Vulnerable Tribal Groups. Despite these overtures, the BJP couldn’t win a single ST-reserved seat from Jharkhand in the 2024 Lok Sabha election; in the assembly election, it lost all but one. Notably, the party didn’t fight the Jharkhand election banking on the allegations of “conversion to Christianity” — it used, instead, “infiltration” as the centrepiece of its political discourse. In this context, the question now is: Does Bhagwat’s statement signal a return to the Sangh Parivar’s discourse on integration and assimilation of Adivasis?

The troubling use of the “anti-national” tag in the context of Adivasis also has a history — its roots lie in a colonial vocabulary. In 1871, the British brought in the Criminal Tribes Act and marked around 200 communities as “criminal” tribes. In the early 1870s, a member of the Viceroy’s Council, J F Stephen, while defining the criminal tribes, said, “We are dealing here with a tribe whose ancestors have been criminals since the very dawn of time, whose members are sworn by the laws of their caste to commit crime”. The term “anti-national” reinforces such vicious colonial understandings and threatens to undermine the BJP’s attempts to woo the tribal constituency.

LAW BY REFLEX

The tendency to make existing laws more stringent is an administrative reflex action often occasioned by political problems set off by particular crimes. The amendments enacted by the Tamil Nadu Assembly to criminal laws on sexual crimes against women fall under this category. In response to the Opposition moves to corner the DMK regime after a rape within the premises of Anna University in Chennai, the government has moved to enhance punishments under the penal and procedural laws. That the perpetrator is a DMK sympathiser and that some details of the student survivor were leaked added political sharpness to the general criticism over such an offence happening inside the campus. At pains to deny any leniency and overcome the setback to its image after the Madras High Court formed a special investigation team, the DMK government has chosen to amend the law based on the theory that more stringent laws deter sexual assault and harassment. This belief is not founded on any statistical or empirical evidence, but is often invoked by those in government. This invariably means the use of legislative power to send out a political message that the administration is committed to women’s safety. After all, necessary amendments need not have to wait for a brazen crime or a public outcry.

This is not to say the amendments are unreasonable: they enhance punishments for a range of sexual offences and extend bail-denying features to such offences as well as those under the POCSO Act. Also welcome is the new provision for passing binding protection orders that will ensure perpetrators do not contact survivors by any means. The death penalty has been introduced for acid attack that results in the victim being reduced to a vegetative state. On the other hand, the newly introduced definition of harassment of women to cover the use of digital and electronic means and even non-verbal means may be too broadly worded and prone to



misuse. Few would disagree with the enhancement of jail terms for rape, sexual assault, sexual harassment, stalking and voyeurism, but a question does arise whether the mere increase in the quantum of punishment increases the possibility of conviction or reduces the incidence of these crimes. The onus of arresting offenders, gathering credible evidence and proving it in court remains the same. Impartial investigation and resisting pressure for a cover-up while effectively implementing existing laws are more crucial for demonstrating commitment to women's safety. Making workplaces, public space and homes safer for women will work better than merely adding to the severity of laws.

CENTRALISING CONTROL

In a federal setup, attempts at undermining any stakeholder in the subject matter of education, which is in the Concurrent List, will prove disruptive. The Draft UGC (Minimum Qualifications for Appointment and Promotion of Teachers and Academic Staff in Universities and Colleges and Measures for the Maintenance of Standards in Higher Education) Regulations, 2025, seeks to do precisely this. Demonstrating the Centre's penchant for facilitating control over institutions through gubernatorial proxies, it proposes to divest State governments of their role in the selection process for Vice Chancellor (VC) of universities. All powers are sought to be vested in the Chancellor — i.e., the Governor in most State universities — by taking away the function of constituting the search-cum-selection committee from the higher education departments. Such a committee would comprise a nominee each of the Chancellor; UGC Chairman; and of the respective university syndicate/senate. The Chancellor would appoint the VC out of three to five names recommended by the committee. Any violations, the draft warns, could attract debarment from participating in UGC schemes and denial of funding under the UGC Act. This comes against the backdrop of conflicts between State governments and Raj Bhavans on appointing VCs, which have deprived several universities, particularly in Tamil Nadu, of leadership. Naturally, opposition has come from several States, including Tamil Nadu, which passed a House resolution urging the Centre to immediately withdraw the draft. Tamil Nadu Chief Minister M.K. Stalin has argued that the draft is not only against the basic federal principles enshrined in the Constitution but also poses a threat to the higher education system. Kerala Chief Minister Pinarayi Vijayan, the AIADMK and the CPI-M have endorsed this stance.

A proposal to make non-academics eligible for the VC's job has also drawn criticism. The draft says such non-academics must have served for at least 10 years at a senior level in industry, public administration, public policy and/or public sector undertakings, with a proven track record of significant academic or scholarly contributions. Mr. Vijayan fears this could be used to appoint Sangh Parivar loyalists. However, universities have benefited from the scholarship of non-academics such as former President K.R. Narayanan and scientist Y. Nayudamma; appointing academics does not guarantee visionary leadership. The proposal to extend the VC's tenure from the typical three to five years is welcome. The UGC would do well to remove anti-federal clauses from the draft regulations and allay apprehensions on other provisions. In the long run, it should aim for reforms to obliterate any governmental role in university administration, except maybe, for funding, and elevate them into truly autonomous institutions that nurture excellence.

AFTER SUMMONS FROM PANEL, META APOLOGISES FOR ZUCKERBERG'S REMARK

Meta Platforms Inc.'s public policy head for India Shivnath Thukral on Tuesday night apologised on behalf of the firm's founder-CEO, Mark Zuckerberg, who on the Joe Rogan Experience podcast implied that India's incumbent government was defeated in the 2024 election.



The apology came shortly after the Parliamentary Standing Committee on Information Technology's Chairman, Nishikant Dubey, said that Meta would be summoned to explain Mr. Zuckerberg's remarks. Mr. Dubey walked back the declaration after Mr. Thukral's apology.

MP writes to panel head

Earlier in the day, reacting to Mr. Dubey's announcement on Wednesday summoning Meta, panel member and Trinamool Congress MP Saket Gokhale, in a letter to Mr. Dubey, had said that if Meta was called, they should also be questioned on their "bias towards certain political parties", the company's decision to stop fact-checking, and changes in its content guidelines on hate speech and disinformation.

"During the time of elections, it has also been noted by several independent reviewers that Meta tends to exhibit a bias towards certain political parties and does not apply the guidelines for political content uniformly," Mr. Gokhale said in the letter.

The Trinamool MP said that Meta has often been accused of not adhering to the guidelines of the Model Code of Conduct during elections, and allowed certain political parties to create proxy accounts that were used for election propaganda.

INFRASTRUCTURE IN GOVT. SCHOOLS CATCHING UP WITH PRIVATE ONES IN 2024

Government schools have notably improved in the provision of basic infrastructure facilities to students over the past 10 years, and are almost on a par with private schools, data show. More than 80% of government schools in India are equipped with functional electricity, ramps, boys' and girls' toilets, handwash, and libraries.

latest data released by the Unified District Information System for Education (UDISE+), maintained by the Ministry of Education.

Compared to 2013-14, the share of government schools providing functional electricity has doubled from 45% to 90% in 2023-24, while the share of those equipped with computers has tripled from 15% to 51% in the same period. The share of government schools having libraries and ramps, and conducting medical checkups, has surpassed that of private schools equipped with the same in 2024.

Facilities such as drinking water, electricity, functional toilets, libraries, ramps, and playgrounds are available in more than 75% of rural schools across India in 2024.

The latest report shows the gap between the share of rural and urban schools in select infrastructure facilities has narrowed. The share of rural schools with ramps and regular medical checkups has surpassed the share of urban schools with the same. Drinking water, toilets, libraries, and playgrounds were provided in almost the same share of rural and urban schools. However, schools in rural areas continue to lag in the availability of computers, rainwater harvesting systems, and internet connection.

Data show that the share of schools with a functional toilet facility has increased and is at least 90% across all States in the latest year. While States such as Kerala, Tamil Nadu, Punjab, and Delhi have sustained their values, there has been a considerable improvement in government and private schools in Bihar, Odisha, and West Bengal.



Compared to 2013-14, more schools have equipped themselves with functional electricity. A decade ago, the share of government schools with functional electricity was less than 50% in States such as Bihar, Madhya Pradesh, Odisha, Uttar Pradesh, and West Bengal. The share has increased close to 80% and above in all these States.

However, the availability of computers is higher among private schools compared to government schools. Except for Kerala whose figures have always been above 90%, the share of government schools having computers is above 80% only in six other States.

The share of government schools equipped with computers is still as low as 12% in Bihar, 19% in West Bengal, and 29% in Uttar Pradesh. However, Chhattisgarh, Jharkhand, Haryana, and Odisha have shown considerable improvement compared to 2013-14.

Interestingly, the tables turn when we look at the share of schools with the availability of ramps. More government schools are equipped with ramps compared to private schools. The trend has been true in 2013-14 as well, not just in the latest year.

EXPRESS VIEW: A MATTER OF SKILLS

The inaugural QS World Future Skills Index has ranked India's job market as second only to the US in terms of readiness to recruit for advanced digital and green technologies. But the report also frames the country's challenges on the knowledge-economy front. Despite its near-perfect score – 99.1 per cent – in market preparedness, India is placed 25th overall in terms of capacity to harness the opportunities opened up by new technologies. In other words, while job advertisements analysed by QS show that Indian companies are seeking competencies in advanced technologies, the country's education system has not kept pace with these demands. A score of 59.1 per cent in the "skill-fit" parameter, the lowest among 30 countries, points to a deficit long underlined by industry bodies. As the QS report also points out, "Employers across India are highlighting a critical gap in the workforce's ability to meet the demands of a rapidly changing economic landscape".

The All India Council for Technical Education (AICTE)'s latest data also illustrates the system's failure to embrace advanced knowledge. The fact that nearly two out of three post-graduate seats in India's engineering colleges were vacant last year shows that M-tech courses provide little value addition. The AICTE's criteria for setting up engineering colleges largely pertain to infrastructure such as classrooms, laboratories and libraries and human resources such as teacher-student ratio. The agency does frame model curricula. Its latest mandate to institutes to start courses in new technologies — AI, robotics, data sciences and cyber security — is in line with NEP's vision of turning engineering colleges into nurseries for industry. However, keeping curricula in tune with rapid technological advancements is a formidable challenge, especially for middle- and lower-rung colleges which do not always attract the best faculty. The country needs to find ways to add to its pool of educators and also keep teachers updated with state-of-the-art knowledge. NEP underlines the need to set up teachers' training colleges. That might take some time. For starters, smaller colleges could tap into the expertise of top institutes such as the IITs to train their faculty.

Part of the problem stems from the low investment in research and development. At .65 per cent, India's R&D expenditure to GDP is very low compared to the global average of 1.79 per cent. In their elation over the country's high score in one section of the QS index, India's policymakers should not miss the larger message: Aligning the educational ecosystem with the rapidly changing knowledge economy will require action on multiple fronts.



WHAT IS DIFFERENT ABOUT SMALL LANGUAGE MODELS?

The story so far:

“We’ve achieved peak data,” former OpenAI chief scientist Ilya Sutskever said onstage at the NeurIPS conference last year. “We have to deal with the data that we have, and there’s only one Internet.” Mr. Sutskever’s comment comes amidst speculation that the speed of progress in large language models (LLM) was hitting a wall as scaling was reaching its digital end.

Why are smaller models in demand?

The race towards building large AI models has been building up ever since OpenAI released their 175 billion parameter LLM, GPT-3, in 2020. In the next three years, the company’s LLMs further increased in size with GPT-4 trained on 1.7 trillion parameters. But, in 2024, researchers started to look at language models differently as scaling training data, scoured from the Internet, was giving marginal gains. The idea of building smaller language models emerged then.

This is evident in announcements made by Big Tech firms. Most of them released a nifty language model alongside their flagship AI models. Google DeepMind released Gemini Ultra, Nano and Flash models, while OpenAI and Meta launched their GPT-4o mini and Llama 3 models. Amazon-backed Anthropic AI launched Claude 3 and Haiku alongside its Opus.

What are the pros and cons of small language models?

Small Language Models (SLMs) are cheaper and ideal for specific use cases. For a company that needs AI for a set of specialised tasks, a large AI model is not required. Training small models require less time, less compute and smaller training data. French start up Mistral AI, an SLM provider, pitched its AI model to be as efficient as LLMs for specialised, focused applications. Microsoft released a family of small language models called Phi (the latest Phi-3-mini comprised 3.8 billion parameters).

Apple Intelligence, the AI system deployed in the latest iPhones and iPads, runs on-device AI models that can sort of match the performance of top LLMs. If LLMs are built to achieve Artificial General Intelligence (AGI), small language models are made for specific use cases.

How do use cases differ?

“Small language models are perfect for edge cases,” said Rahul Dandwate, ML engineer at Adobe. “When I am using WhatsApp or any Meta application which is powered by the Llama 8B model, I am trying to learn a new language because its reasonably good at translation and other basic tasks like this.”

“But they wouldn’t do well at most benchmarks that large language models are measured against like coding or logical problems. There still isn’t a small language model that’s as good at solving more complex problems,” he said.

We still aren’t fully aware why this bottleneck exists. “But the best way we can understand this is just as human beings have brains with a massive number of neurons, a smaller animal has a limited number of neurons. This is why human brains have the capacity for far more complex levels of intelligence. This is similar to how small language models and large language models work,” he said.



How does it work for India?

In a country like India, where the scope of AI adoption is immense but resources are constrained, the diminutiveness of SLMs is perfect. Another AI initiative from IIIT Hyderabad, Visvam, is building datasets from the ground up to build SLMs that can be used in healthcare, agriculture, education and to “promote and preserve language and cultural diversity through AI,” their website stated. As the world of language model develops, it’s not just enough to build frontier models from scratch. Sarvam AI’s co-founder Vivek Raghavan said, “We want to build GenAI that a billion Indians can use.”

ATMANIRBHAR AT SEA

C. Uday Bhaskar Writes: In a symbolically significant ceremony, Prime Minister Narendra Modi dedicated three frontline naval platforms to the nation on January 15 in Mumbai.

- A major destroyer, a frigate and a submarine were commissioned on the same day and this is unprecedented. The three platforms — the destroyer INS Surat, frigate INS Nilgiri and submarine INS Vagsheer — have been built in India at the Mazagon Docks and will burnish the current focus on “atmanirbharta”.
- Recalling India’s maritime heritage going back to the Chola dynasty (3-12 CE) and that of Chhatrapati Shivaji Maharaj who gallantly resisted the colonial powers at sea, Modi tweeted: “Today’s India is emerging as a major maritime power in the world.” It was also highlighted that this triple commissioning is a significant leap forward towards self-reliance and that INS Surat, the fourth and final ship of the P15B Guided Missile Destroyer Project, which ranks among the largest and most advanced destroyers in the world, has an indigenous content of 75 per cent.
- The assertions by PM Modi about India’s maritime profile in the larger global context and the laudatory claims about the navy having achieved a considerable degree of indigenisation in warship building need to be placed in the appropriate context.
- The US is the world’s leading naval power. The composite naval capability of the US is distinctive and while Russia and China have significant naval capability, the former is in relative decline and the latter has not yet “arrived” to be deemed a global naval power.
- In the regional context, related to the Indo-Pacific, China is undoubtedly the major naval and maritime power and India is a distant second. While the total number of major naval platforms (surface ships and submarines) is one metric, a more recent assessment that deduces naval power in a more holistic manner which includes inventory, logistics, indigenisation index and operational experience provides an instructive insight.
- Termed as True Value Rating (TrV), the following distillation is self-explanatory. The US is estimated to have a total of 243 major naval units and its TrV is the highest at 323.9. In comparison, China is a close second at 422 platforms and 319.8 TrV and India is at number seven position in this ranking with 103 units and a TrV of 100.5.

Do You Know:

- According to C. Uday Bhaskar, India is not at the same level of shipbuilding technology and manufacturing competence but it has to invest in this sector and improve efficiency levels if it is to realise the Modi maritime vision. Concurrently a reality check about the quality of



indigenisation is imperative. For instance, the 75 per cent indigenisation figure claimed for INS Surat masks the fact that most of the critical ordnance package that makes the vessel a potent warship is obtained from foreign suppliers. The only success that India has had to date is the Brahmos missile and this is commendable but has to be scaled up.

- According to SIPRI, India became the fourth largest military spender globally in 2023 with a spending of \$83.6 billion — 4.2 per cent higher than that made in 2022.

NEW NATIONAL MUSEUM IN DELHI TO DISPLAY ARTEFACTS IN CHRONOLOGICAL AND THEMATIC ORDER

North Block and South Block in the national capital, which are set to house the new National Museum, will have artefacts arranged chronologically and thematically, according to a draft proposal under consideration of the Union Culture Ministry.

North Block, which is likely to be the first one of the buildings where retrofitting will be completed, is expected to house the artefacts in a chronological order, while South Block is likely to have theme-based sections, sources told *The Hindu*.

India signed a memorandum of understanding with France on December 19 last year for the development of the new museum, along the lines of the Louvre in Paris. The museum will be developed through adaptive reuse in collaboration with France, which is renowned for its expertise in such projects — exemplified by the Louvre, the Grand Palais, and the Hotel de la Marine. This approach mirrors France's 'Grand Projects' initiative that transformed government buildings into iconic cultural spaces.

The chronological arrangement will have about 50 sections each with 5-6 rooms and thus around 250 galleries in total. The thematic section would have displays based on different subjects such as literature, architecture, and art. There would also be galleries with augmented reality, educational centres and children's corners.

2,06,000 artefacts

North Block houses the Ministries of Finance and Home Affairs, while South Block houses the Prime Minister's Office, and the Ministries of Defence and External Affairs.

Offices in both the buildings are being moved to the Common Central Secretariat (CCS) building on Janpath as part of the Central Vista plan.

The new museum, which has been named 'Yug Yugeen Bharat' museum, will be able to house an estimated 25,000-30,000 artefacts and is expected to be the largest such museum in the world when completed.

As of now, the National Museum has 2,06,000 artefacts in total, out of which, 7,000-8,000 are on display.

"We have sought artefacts from all museums across the country for display in the upcoming new museum. While they are most welcome to send things on a permanent basis, we can also display them on a temporary basis and keep rotating them," B.R. Mani, Director General of the National Museum, told *The Hindu*.



INDIA METEOROLOGICAL DEPARTMENT (IMD) COMPLETED 150 YEARS OF SERVICE

- The India Meteorological Department (IMD) completed 150 years of service on Wednesday (January 15).
- Established in 1875, the India Meteorological Department (IMD) completed 150 years of service on January 15. To mark the occasion, Prime Minister Narendra Modi inaugurated Mission Mausam on January 14.
- Mission Mausam will aim to upgrade the capabilities of India's weather department in forecasting, modelling, and dissemination. Mission Mausam will have a budget of Rs 2,000 crore for the first two years of its implementation.
- It will invest heavily in improving weather surveillance, modelling, forecasting to directly benefit key sectors — from agriculture, aviation and defence to disaster management, tourism and health, according to a statement by the government.
- Mission Mausam aims to cover all aspects of weather and forecasting services offered in the country. A similar boost to monsoon prediction took place in 2012, with the launch of Mission Monsoon. It had targeted the improvement of India's long-range forecasts.
- Currently, IMD forecasting of an extreme event such as heatwaves up to 24 hours in advance is about 97.99 per cent accurate. The accuracy for heavy rainfall forecasts, however, stands at only about 80 per cent.
- The mission will also 'manage' certain weather events, and on-demand, enhance or suppress rainfall, hail, fog and, later, lightning strikes.
- For effective weather modification, one of the most important areas is cloud physics, in which India will have to strengthen research. Towards this end, India is establishing a first-of-its-kind cloud chamber at the Indian Institute of Tropical Meteorology (IITM), Pune.
- A cloud chamber resembles a closed cylindrical or tubular drum, inside which water vapour, aerosols, etc. are injected. Under the desired humidity and temperature inside this chamber, a cloud can develop.
- The Pune facility will allow scientists to study the seed particles that form cloud droplets or ice particles sustainably.
- Many countries have basic cloud chambers, which have limited functionalities and scope to perform specific studies.
- With Mission Mausam, however, India will build a cloud chamber with convection properties, as required to study Indian monsoon clouds. Globally, there are only a handful of convective cloud chambers.

WHY INDIA IS WARMING SLOWER

The World Meteorological Organisation last week declared the year 2024 to be the warmest ever since measurements began. The average annual mean temperature of the Earth during the year was more than 1.5 degrees Celsius higher than pre-industrial levels (1850-1900 period).



- The year 2024 was warmest for India as well, as announced by the India Meteorological Department (IMD) earlier this month. However, the extent of warming over India is very different from the world as a whole.
- IMD said the year 2024 was 0.65 degrees Celsius higher than normal. The normal, in this case, is the average for the 1991-2020 period.
- Because of the difference in baselines, the two pieces of data, representing the warming over India and the world as a whole in 2024, cannot be directly compared.
- IMD does not have temperature data over India for the 1850-1900 period to facilitate a straight comparison as its dataset begins from 1901.
- The average of 1901-1910 period might be a more useful baseline for comparing the temperature rise over India with the world as a whole. IMD data shows that temperature over India in 2024 was about 1.2 degree Celsius higher than the 1901-1910 average.
- The break-up of the warming over global land surface and oceans for 2024 is not available immediately, but previous data shows that land temperatures have increased by more than 1.6 degree Celsius from pre-industrial levels while oceans have warmed by about 0.9 degree Celsius.
- The 1.2 degree Celsius warming over India is considerably less than the 1.6 degree Celsius, or higher, that has been experienced over the global land surface. This is not surprising, but it also does not mean that the threat of climate change is less in India compared to other areas.

Do You Know:

- India is located in the tropical area, quite close to the equator. **The increase in global temperature has been more pronounced in the higher altitudes, near the polar regions, than near the equator.**
- According to the Intergovernmental Panel on Climate Change (IPCC), the Arctic region has seen its temperature increase by at least two times compared to the global average.
- In the Arctic, current annual mean temperatures are already about 2 degree Celsius higher than pre-industrial levels.
- Another reason contributing to higher temperature rise in the polar regions is what is known as the **albedo effect**. The ice cover in the Arctic is melting, resulting in more land or water is getting exposed to Sun. Ice traps least amount of heat and reflects most of solar radiation compared to land or water.
- The greater concentration of aerosols, or suspended particles, in the atmosphere over the Indian region also impacts temperature rise.
- Aerosols, in general, have a cooling effect because they scatter the solar radiation back into space. Aerosols also affect cloud formation which, in turn, affects how much sunlight is absorbed or reflected. Being located in the tropical region, India sees a greater amount of dust. But it is also generating huge amount of air pollution. The particulate matter and aerosols have a small unintended consequence of lowering the temperature rise.
- **India is not a uniform landmass. The average temperature rise over the Indian region does not capture the different levels of warming being experienced in different parts of the country. The nature and impact of temperature rise in the Himalayas, for example, is very different than that in**



the coastal regions. India's vulnerability to climate change is very high, not in the least because of its large population.

- Global climate models do not very well reflect the changes happening over the Indian region. Same is true for the global assessments of the impacts of climate change. As such, India needs to strengthen its capabilities in climate observation and impacts assessment.
- The first India-specific climate change impact assessment was carried out in the year 2020 and filled a big gap in the understanding of threats from climate change. But this has to be an ongoing exercise, just like IPCC does a global assessment every few years.

IS GROUNDWATER CONTAMINATION HIGH IN INDIA?

The story so far:

An assessment of India's groundwater by the Central Ground Water Board (CGWB) found that several States are grappling with a serious problem of nitrate contamination.

Which are the sources of contamination?

The most concerning finding was that the number of districts with excessive nitrate in their groundwater rose from 359 in 2017 to 440 in 2023. This works out to nearly 56% of India's districts having excessive nitrate in ground water, defined as having more than 45 mg/l (milligram per litre). Of the 15,239 groundwater samples collected from across the country for testing, 19.8% samples had nitrates — nitrogenous compounds — above safe limits though it must be said that this proportion has not substantially changed since 2017. In the 13,028 samples analysed in 2017 for instance, 21.6% had excessive nitrate. There are two major concerns with excess nitrate content: one is methemoglobinemia, or a reduced ability of red blood cells to carry oxygen.

A bigger problem with excessive nitrates are environmental: once the nitrates in the groundwater rise to the surface and become part of lakes and ponds, algal blooms throttle the health of aquatic ecosystems.

The most common contaminant identified in groundwater is dissolved nitrogen in the form of nitrate in sub-surface waters. Since, the nitrogen content of soil is generally quite low, farmers have to look for external sources of nitrogen by using ammonium nitrate, calcium nitrate, urea, diammonium hydrogen phosphate etc. Although nitrate is the main form in which nitrogen occurs in groundwater, dissolved nitrogen also occurs in the form of ammonium (NH₄⁺), ammonia (NH₃), nitrite (NO₂⁻), nitrogen (N₂), nitrous oxide (N₂O) and organic nitrogen.

Which places had serious contamination?

Rajasthan, Karnataka and Tamil Nadu reported the highest proportion of tested groundwater blocks with nitrate exceeding permissible levels — 49%, 48% and 37% of the tested samples respectively reported numbers beyond the limit.

Rajasthan, Madhya Pradesh and Gujarat have a long-standing nitrate problem with relative levels fairly constant since 2017, the report says. However a growing concern are blocks in central and southern India, which are reporting an increasing trend, and therefore is a reason for worry. "Maharashtra (35.74%), Telangana (27.48%), Andhra Pradesh (23.5%) and Madhya Pradesh (22.58%) also show notable levels of nitrate contamination," the report notes.



Is nitrate the only chemical contaminant?

Other major chemical contaminants affecting groundwater quality are arsenic, iron, fluoride and uranium. Just as 19.8% samples of tested groundwater had excess nitrate, 9.04% of samples had fluoride levels above the limit.

Fluoride concentrations exceeding the permissible limit were “a major concern” in Rajasthan, Haryana, Karnataka, Andhra Pradesh and Telangana. Rajasthan and Punjab reported the maximum number of samples with uranium concentration exceeding 100 ppb (parts per billion). Anything over 30 ppb is considered unsafe and several of these samples were predominant in regions of Rajasthan, Gujarat, Haryana, Punjab, Tamil Nadu, Andhra Pradesh, and Karnataka, where groundwater was over-exploited: more water was being drawn out than replenished by rains or other means.

What was the state of groundwater in 2024?

Along with its report on groundwater quality, the organisation also produced a report on the quantity of groundwater in various blocks, enumerating the availability of groundwater across India. The CGWB estimates that on the whole, the country’s degree of groundwater extraction is 60.4%, or roughly the same as it has been through the years since 2009. About 73% of the blocks are in the ‘safe’ zone, meaning that they are replenished enough to compensate for water drawn out.

How are groundwater levels measured?

The CGWB relies on a network of about 26,000 groundwater observation wells that require technicians to manually measure the state of groundwater in a region. Since 2023, however, around 16,000-17,000 digital water level recorders were connected to **piezometers** in the wells. Piezometers measure groundwater levels and transmit the information digitally to a centralised location. In the next three years, the CGWB aims to increase its network from the existing 26,000 to about 40,000. When combined with similar networks possessed by other institutions, India will have about 67,000 digitally recordable units to monitor ground water dynamics.

KOLKATA SECOND IN GLOBAL LIST OF CITIES WITH SLOWEST TRAFFIC; BENGALURU THIRD

Kolkata’s roads were the second most congested in the world in 2024, and the most congested in Asia, the latest survey by the Netherlands-based location technology firm TomTom said. According to the report, drivers in the city spent an average of 34 minutes and 33 seconds to travel a distance of 10 km.

Kolkata was followed closely by Bengaluru, where drivers spent 34 minutes and 10 seconds to cover 10 km. Pune finished third with a travel time of 33 minutes and 22 seconds for the same distance, leaving India with three cities in the global top five.

Hyderabad (31.5 minutes) was the other Indian city in the top 20 globally, taking the 18th spot.

Barranquilla City (36 minutes, six seconds) in Colombia took the top spot and London (33 minutes, 17 seconds) rounded up the top five of the rankings.

While 110 hours were lost per year due to traffic conditions in Kolkata, it was 117 hours in Bengaluru, 108 hours in Pune and 85 hours in Hyderabad.



Featuring 500 cities across 62 countries on six continents, the 14th edition of TomTom Traffic Index evaluated cities by their average travel time and congestion level. The study used Floating Car Data (FCD) to calculate travel times.

Chennai was 31st in the list, with drivers spending 30 minutes and 20 seconds to cover 10 km while Mumbai (29 minutes, 26 seconds) was 39th.

WHAT IS THE GENOME INDIA PROJECT? WHY DOES IT MATTER?

Genome India project: The Department of Biotechnology recently announced its new platform and framework for sharing its 10,000 human genome dataset.

- The sequences of healthy individuals — from 99 ethnic populations of the country — has helped create a baseline map of India’s genetic diversity. The researchers in the second phase plan to sequence genomes of those with specific diseases.
- To sequence the genome, researchers first extract the information from the blood. Handling the entire genome, however, is extremely difficult. So, the researchers cut it up into smaller pieces and tag them.
- A sequencer is then used to decode these smaller chunks of the genetic material. Once done, it is put together using the tags to create a whole genome — in the same way one would assemble say an Ikea furniture by numbers.
- For now, the data will be available to Indian researchers through managed access. “This is the first time that we have created a resource such as this and we have to be very careful how we share this highly sensitive data. The data will be made available only through managed access — meaning it would be available only to research institutes that partner with us for the study,” said Dr Suchita Ninawe, senior scientist from department of biotechnology.

Do You Know:

- The Genome India project was first approved in 2020 with the aim of capturing this diversity at the genomic level.
- Researchers from 20 different scientific institutions have come together to sequence the first 10,000 genomes under the project. With everything in place — a successful collaboration, a data storage facility, data sharing platform, and a framework — the department of biotechnology aims to expand the programme further and sequence up to 1 million genomes.
- The second phase of the project would involve sequencing the genomes of those with specific disease. This will enable researchers compare the diseased genomes with the healthy ones, helping in identifying genes that are responsible for or pre-dispose a person to certain diseases. They may be able to study the genetic changes when someone gets a disease, take for example cancer.

LONG OVERDUE, SHORT-TERM REGIMEN FOR TB SET TO BE A GAME CHANGER

Multidrug-resistant tuberculosis (MDR-TB) is a strain of the TB disease in which the infecting tuberculosis germs are resistant to the effects of rifampicin and isoniazid, two of the most potent drugs available for TB treatment. Being infected with such TB strains carries up to a 30-40% risk



of death, making MDR-TB a serious, life-threatening illness. India bears a significant burden of TB and has a growing burden of MDR-TB; of the 1,75,923 persons reported to the World Health Organization in 2023, 27% were from India.

For years, the evolution of such resistant germs was largely attributed to the lack of adherence to TB treatment and misuse of TB drugs, especially through improper drug regimens, both of which aid the selection of mutant strains of the bacterium. This is common in India, and often the duration of treatment (6 months) and the number of drugs (typically 4 at the start of treatment) made treatment adherence for drug-sensitive (DS) TB challenging. It is therefore ironic that until recently, the treatment of DRTB involved even more drugs (at least five), which were far more toxic than drugs used for drug-sensitive TB, for a longer duration (18 months or more). It is not surprising then that TB-affected communities globally have for years been advocating and asking for shorter, less toxic treatments, but were often ignored.

The health research and delivery system systematically deprioritised these demands. Perhaps it was because TB-affected populations lived largely in the Global South. Physicians were taught to advise patients to ignore these side effects and have often gaslighted patients for complaining about these side-effects. Intramuscular injections were prescribed to be taken daily, leading to painful swellings, making even being seated a challenge, making work, school, and leisure constantly painful and often impossible. Hearing loss, a side effect of injectables, was dismissed with “better deaf than dead.” Skin discolouration, a common adverse effect of clofazimine added to the TB stigma but was termed a “minor adverse effect,” without really appreciating what the affected individual went through.

Menstrual cycles were disrupted, appetites were lost and people suffered dealing with severe depression and suicidal ideation. All were termed secondary to medications, which they had to endure for at least 18 months.

Shorter regimens

Shorter regimens have for long been the need of the hour. The most important and obvious advantages of the regimens are the duration of treatment, improved ability to complete treatment, and hopefully less economic burden. These were envisaged as all-oral regimens with a low overall pill burden.

Among the most recent of these is the BPaL regimen, which has three oral drugs — bedaquiline, pretonamid and linezolid (BPaL/M has four drugs, along with moxifloxacin) — prescribed for six months. The Nix-TB trial proved the efficacy of the regimen in 109 patients enrolled in three South African centres. The ZeNix trial, conducted across four countries (South Africa, Georgia, Moldova, and Russia,) enrolled 181 participants and found that a lower dose of linezolid (600 mg once a day instead of twice) was better tolerated with similar outcomes.

While these new regimens can be game changers, caveats need to be kept in mind. First, adherence needs to be closely monitored, as bedaquiline resistance has been reported in a high proportion among those failing treatment. Several phone-based and digital devices have been used to improve adherence, in addition to counselling, and these need to be an integral part of treatment. Currently, these are missing in high-burden countries. Second, drug-susceptibility testing needs to be widely accessible to know whether the regimen is appropriate for a given patient. We should not treat these as silver bullets to be used indiscriminately. It only makes sense to prescribe a drug when one is certain that the drug works, and this is likely to get more relevant as treatment is widely prescribed.



There is also the development of antimicrobial resistance that is an inevitable consequence of such use in a subset of patients. Finally, shorter regimens are not devoid of adverse effects. Linezolid is notorious for causing disabling sensory neuropathy in a proportion of patients, and such adverse effects need to be watched for, and alternate regimens clearly defined for those who may not tolerate these regimens. We also must evaluate these regimens on the basis of individual experience and adverse events that affect the quality of the affected individual during and post treatment.

Preparedness is key

The other key issue is health system preparedness, which remains low. Training of physicians in how to manage such situations has to be a part of the rollout. If we truly want to prevent MDR-TB, we must arrest the spread. This can only be achieved by universal molecular diagnostics to detect drug-resistant TB at an early stage.

Since a majority of patients with TB, access private healthcare as their first point of contact, we need large-scale efficient, and reliable private-public partnerships to ensure access to these regimens while preventing their abuse by making them indiscriminately available.

Shorter regimens are likely to be more expensive for the programme. However, continuing inexpensive but toxic regimens would be myopic and will cause patient suffering, which often leads to them giving up.

While the government must be lauded for taking this step forward to roll out the new regimens, even if this move was delayed, preparedness, community education, and supportive services such as counselling and side effects management are key.

While new regimens are critical, it is also important not to forget the critical role of stigma reduction, economic and nutritional support, and better living environments for TB-affected populations.

TB can be cured more quickly, but are we doing enough to prevent it? New regimens with only a focus on pill burden should not make us overlook the structural social, economic, and gender determinants in TB. Nor should we forget what we need is person-centred, high quality care that informs, engages, and works with the affected individual and their families to address why some groups get TB in larger proportions and why some others give up on treatment.

A shorter regimen is transformative but not the answer to all the issues that persist in TB.

Keeping in mind many such intervening factors, systems need to think of a more person-centred view of care and delivery. Under this, a quick rollout, with systemic preparedness and the above caveats, would help clinicians offer more humane treatment, cure patients faster, and allow them to return to their lives without huge disruptions. The answer to controlling TB, though, is not new regimens alone but a broader systemic transformation that may still be missing.

IN MEGHALAYA, SUPERSTITIONS MAKE THINGS WORSE FOR CANCER PATIENTS

An “evil eye” or “toxic vibes” from a person supposed to have bad intent is believed to be among the causes of cancer, a study on the factors influencing delayed healthcare in Meghalaya has revealed.



Researchers from the Indian Institute of Public Health in Shillong, the Department of Radiation Oncology of Civil Hospital Shillong, and the State Department of Health and Family Welfare interviewed 37 cancer patients, 12 caregivers, and five healthcare providers between July and October 2021 to understand barriers to cancer care in Meghalaya. The individuals were selected from among people treated at the Civil Hospital Shillong for the five most common cancers in the State: oesophageal, breast, oral, cervical, and lung cancer.

The researchers were Barilin Dkhar, Carmenia Khongwir, Uniqueky Gratis Mawrie, Fellicita Pohsnem, Redolen Rose Dhar, Anisha Mawlong, Rajiv Sarkar, Melari Shisha Nongrum, and Sandra Albert. Their paper was published in the *Indian Journal of Medical Research* in October 2024.

According to the paper, the caregivers and healthcare providers highlighted the prevalent cultural concepts in the community regarding the causes of cancers, such as “bih” and “skai.”

“‘Bih’ is not an easily translatable word; its literal translation could be ‘poison,’ but here, it does not represent poison in the literal sense, rather it represents a concept in Khasi (the language of the matrilineal Khasi community) which embodies a situation associated with an illness acquired after a person has come in contact with or eaten food with/of a person with bad intent,” the paper said.

Likewise, ‘skai’ is the Khasi equivalent of the evil eye in English.

“The stigma and certain religious beliefs among the poor and illiterate people are strong because of the lack of awareness. In many remote, hilly areas, people tend to use traditional or herbal healing. Many patients who come here for treatment think cancer is an infectious disease,” Amal Chandra Kataki, director of the government-run B. Borooah Cancer Institute in Guwahati, told *The Hindu*.

Vulnerable region

In 2022, India recorded 14.61 lakh cancer cases, with one in nine people in the country projected to suffer from the disease in their lifetime. Studies have estimated a 12.8% increase in the number of annual cancer cases by 2025, to around 15 lakh.

India accounts for about 7% of the world’s cancer burden. The highest cancer incidence in the country is in the northeast, including Meghalaya.

The new study said the region’s cancer profile includes a high incidence of cancers of the upper digestive tract, such as of the stomach, oesophagus, and hypopharynx.

Its paper said the oesophagus is the “leading site” of cancer in both genders, followed by those of the hypopharynx in males and of the mouth in females in Meghalaya. These patterns have been attributed to the consumption of alcohol and tobacco and a diet that includes not inconsiderable quantities of smoked meats and fish.

The paper added that “studies have reported low awareness regarding the signs, symptoms, and risk factors of cancers in the region, as well as lower adoption of methods for early cancer detection, such as self-breast examination, potentially contributing to delays in diagnosis and poor survival.”

The lack of cancer-screening also lowers the odds of positive outcomes.



“Awareness about cancer, which needs to be multi-pronged, has not been as intense as for HIV/AIDS,” Dr. Kataki said.

“Many lose the battle against cancer because they come for treatment at the final stages, unlike in Western countries, where early detection saves lives. If the HIV/AIDS campaign could generate awareness in the Northeast on a large scale, a sustained and innovative campaign on cancer care can work too.”

Cultural underpinnings

The researchers’ interviews revealed the perspectives on health and diseases of the tribal population — the Khasis, with seven sub-groups, and Garos comprise 86% of Meghalaya’s 3.27 million people — due to their beliefs may be an important barrier to ideal health-seeking behaviour of individuals with cancer.

In particular, misconceptions, fatalism, and cultural underpinnings were found to be the principal barriers. Misconceptions included beliefs that radiation would “cook” a patient while fatalism held that the patients were destined to suffer.

“Bih” (taint) and “skai” (evil eye) were examples of cultural ideas in the community regarding the causes of cancer, the study said. “Kren jemdaw,” which means to speak negatively about a person, was also believed to make people susceptible to illnesses like cancer.

Other barriers included hesitancy and stigma. Some respondents said they were uncomfortable about discussing their diagnosis while others believed disclosure could bring bad luck.

“Embarrassment and a sense of shame contributed to perceived stigma, depending on the body parts affected,” the paper said. “Female patients suffering from breast and cervical cancers expressed these feelings.”

Addressing the problem

“Cultural beliefs were just one component among multiple influences on delayed care seeking. We are working with communities to jointly develop approaches that could address the problem,” Sampath Kumar, Principal Secretary of Health and Family Welfare, Meghalaya, told *The Hindu*. “It is a work in progress. Behaviours can take considerable time to change.”

The interviews also underscored a tendency among the patients to self-medicate, including with over-the-counter preparations. They sought medical consultation only once the remedies proved ineffective. Ten of the 37 individuals interviewed also said they sought treatment from traditional healers. The preference for affordable and accessible traditional medicines was more prevalent among the males, the study said.

“We are in the process of using new virtual reality technologies to remove fears about cancer to help better recovery of cancer patients,” Mr. Kumar said. “This would also help patients understand the science behind the cancer and its treatment.”

“We launched the Meghalaya Cancer Prevention Mission two years ago to ensure early detection and care. We enhanced screening in the large East Khasi Hills district, which helped increase overall awareness,” he added. “We are now getting more new cases reported early due to these efforts.”



The researchers acknowledged that their findings are limited by a “potential lack of generalisability” because most participants were “enrolled from a single government hospital,” even if it was a principal referral centre. They also wrote that the individuals’ views of cancer care may have been influenced by the importance given to COVID-19 as the interviews were conducted during the pandemic.

“Nevertheless, this study highlights the barriers for cancer diagnosis and treatment in an indigenous or tribal population in Northeast India,” the paper added. “Our findings underscore the need to address such misconceptions through culturally appropriate messaging via locally suited channels of communication, while addressing the health system-related barriers such as improving the capacity building of healthcare workers in cancer diagnosis and treatment.”

BURROW TRAGEDY

With four deaths so far, the coal mining tragedy in Assam’s Dima Hasao district has revived a long-standing debate on the hazardous nature of rat-hole coal mining in India. As opposed to modern coal mining, which is mechanised, the ‘rat-hole’ points to the crude and antiquated technique of employing people, and even children, to burrow into the ground to scoop out the underground coal. Depending on the depths that they plumb, the odds are high that their pickaxes will often unleash a torrent of water from a hidden aquifer that can suddenly inundate the excavated tunnel — as it is suspected to have happened at Dima Hasao. Because such accidents have recurred over the decades, along with the attendant health and environmental hazards, this mode of mining was banned by the National Green Tribunal (NGT) in 2014. The use of proper geological surveys and appropriate machinery would have made the mine economically unviable. The Assam Chief Minister has stated that the mine appeared to be “prime facie... illegal” and one abandoned by the State’s Mines and Minerals Department. If that is the case, it reflects poorly on the State administration that such mines can be exploited by unscrupulous elements with such ease, despite the ban. Surely, this is only a fraction of the unregulated mining that actually goes on.

The Supreme Court of India, in 2019, had asked whether it was possible for such mining to continue without the “connivance” of officials, when it was examining the rescue of 15 miners trapped in a rat-hole mine in the East Jaintia Hills in December 2018. A report submitted by a monitoring committee set up by the NGT observed that despite the ban, the demand for coal to power cement manufacturing and thermal power plants in the northeast had sustained and supported rat-hole coal mining. On the other hand, when convenient, State authorities have sought out and even felicitated rat-hole miners, some from Assam, as in 2023, when they were called in as a last resort after advanced machinery and the expertise of professional geologists and earth scientists had failed to rescue 41 construction workers trapped in the large, over-ground Silkiyara tunnel in Uttarkashi. The Dima Hasao operation too, like others, will end and the net success or failure of saving those trapped will induce a familiar amnesia that will be broken only by the next accident. Until decisive action to puncture the economics of rat-hole mining is taken, India is only burrowing the way to another tragedy.

RAT-HOLE MINING: WHY THE PRACTICE CONTINUES IN SPITE OF ITS HAZARDS

On January 6, 2025, nine workers were trapped in a flooded coal mine in Assam’s Dima Hasao district. Bodies of four of the workers have been recovered, and rescue work is still ongoing. In this article, dated November 29, 2023, Rahul Karmakar explains the dangers of rat-hole mining.



The story so far:

An oral question from the Supreme Court to the Union government continues to remain unanswered even as rescue workers recover bodies of workers who died trapped in a flood rat-hole coal mine at Dima Hasao district in Assam. On January 11, 2019, the top court had asked whether rat-hole mines could possibly operate in the northeast hills without the “connivance” of officials. “Lives are lost due to illegal mining. What about the officials who allowed this to happen?” the court had asked the government.

What is rat-hole mining?

Rat-hole mining, of two types, is so named as it involves digging tunnels 3-4 feet deep, barely allowing workers to crawl in and out. They have to squat while extracting coal with pickaxes. The side-cutting type of mining is usually done on hill slopes by following a coal seam — dark brown or black-banded coal deposited within layers of rock— visible from the outside. The second type called box-cutting entails digging a circular or squarish pit at least 5 sq. metre in width up to a depth of 400 feet. Miners who drop down in makeshift cranes or using rope-and-bamboo ladders dig horizontally after finding the coal seam. The tunnels are dug in every direction from the edge of the pit, resembling the tentacles of an octopus. Some workers from Assam lost their lives in the coal mines of Meghalaya, dug using this crude method, before and after the National Green Tribunal (NGT) banned it in April 2014.

Why is such mining banned?

The government has little control over the land in Meghalaya, a Sixth Schedule State where the Coal Mines Nationalisation Act of 1973 does not apply. The landowners are thus also the owners of the minerals beneath. Coal mining boomed after Meghalaya attained statehood in January 1972. However, the terrain and expenses involved discouraged mine owners from employing advanced drilling machines. So, labourers mainly from Assam, Nepal, and adjoining Bangladesh risked the hazards of rat-hole mining — asphyxiation because of poor ventilation, collapse of mines due to lack of structural support, and flooding — to earn thrice or four times as much as working in farms or construction sites. Apart from issues of safety and health, unregulated mining led to land degradation, deforestation, and water with high concentrations of sulphates, iron, and toxic heavy metals, low dissolved oxygen, and high biochemical oxygen demand. At least two rivers, Lukha and Myntdu, became too acidic to sustain aquatic life. These factors led to the NGT banning rat-hole mining in Meghalaya in 2014 while observing: “...there is umpteen number of cases where, by virtue of rat-hole mining, during the rainy season, water flooded into the mining areas resulting in the death of many...” Illegal mining and transportation of coal, as mentioned in the interim reports of a one-man committee appointed by the High Court of Meghalaya, has continued despite the ban and the loss of lives. At least 17 miners were drowned in an illegal mine in the East Jaintia Hills district’s Ksan in December 2018 after water gushed in from a river.

What led to the NGT ban?

Environmentalists and human rights activists began flagging the hazards of rat-hole mining in Meghalaya two decades ago. The campaign intensified after Impulse, a Meghalaya-based NGO, began addressing the issue of human trafficking and child labour in such mines.

Three reports prepared by the NGO, first with the Nepal-based Esther Benjamin Trust in May 2010, the second with Aide et Action in December 2010, and the last with Human Rights Now in July 2011, estimated that about 70,000 children mostly from Bangladesh and Nepal were



employed in these mines because they were the right size to work in them. The State's Department of Mining and Geology refuted the claim but, under pressure from the National Human Rights Commission, admitted in June 2013 that 222 children were employed in rat-hole mines, specifically in the East Jaintia Hills district. The NGT ban came a year later.

What is the way forward?

Unlike in Chhattisgarh and Jharkhand, coal seams in Meghalaya are very thin. This, miners say, makes rat-hole mining more economically viable than opencast mining.

The State has an estimated reserve of 576.48 million tonnes of low-ash, high-sulphur coal belonging to the Eocene age (33-56 million years ago). The stakes for a section of locals have been so high that the State government has been under pressure to facilitate the resumption of mining legally.

In May 2023, Meghalaya Chief Minister Conrad K. Sangma said the Coal Ministry approved mining leases for four of the 17 prospective licence applicants. This would lead to the commencement of 'scientific' mining ensuring minimal environmental impact through sustainable and legally compliant extraction procedures. Anti-mining activists, who are assaulted by miners off and on, said that 'scientific' would eventually be a fancy tag in a State where profit has driven coal mining.

SCRIPT READING

The recent announcement by Tamil Nadu Chief Minister M.K. Stalin, of a \$1-million prize scheme for deciphering the script of the Indus Valley Civilisation (IVC), seems to have revived popular interest in the subject, which remains a puzzle to archaeologists, historians and linguists. His invitation for further research was made in the context of the centenary celebration of the IVC discovery, which was published by then chief of the Archaeological Survey of India, John Marshall, in September 1924. Spread across 1.5 million square kilometres in the territories of modern-day India, Pakistan, and Afghanistan during the Bronze Age (3000-1500 BCE), the IVC, also known as Harappan Civilisation, was regarded as complex as the better-known civilisations of Mesopotamia, Egypt and China. The Indus civilisation was essentially urban. Even though there has been a large number of objects and materials of archaeological value in support of the IVC, the decipherment of seals and tablets has not been to the satisfaction of all. About 20 years ago, a group of western scholars had argued that writing was not a necessity of ancient urban settlements, not even those as massive as those of the Harappans, and that "a handful of unknown symbols" could no longer be claimed as evidence of writing. Since then, there has been an exchange of scholarly views for and against the theory of the Indus civilisation being a highly literate society. It is against this context that Mr. Stalin's announcement needs to be seen. There is also a school of thought that there was a script which was "proto-Dravidian", "non-Aryan" and "pre-Aryan". This could be a reason why a southern State, Tamil Nadu, has made the offer. The State government has also supported a study on Indus signs and graffiti marks of Tamil Nadu as part of a project of the documentation and the digitisation of graffiti and Tamil (Tamil-Brāhmī)-inscribed potsherds of Tamil Nadu.

Researchers face certain challenges while resolving the Indus riddle. There is a complaint that the entire database regarding the seals has not yet been made available in the public domain. While allowing free access to these resources, central and State authorities should ensure that context for them is also provided. More importantly, studies should be carried out without any interference. The likelihood of the proposed study's findings going against the established and



particular narrative should not be allowed to cloud intellectual pursuit. There is also scope for well-coordinated work among South Asian countries, including Sri Lanka, Bangladesh, Pakistan and Afghanistan, to unravel the mystery. But if political differences are permitted to adversely impact the execution of any such study, the world, and India, will be much the poorer for it.

SAFETY AND PIETY

Despite the hundreds of thousands who throng the Tirumala temple in Tirupati every year for the Vaikunta Ekadasi celebrations, stampedes at the world-renowned hill temple have been rare. However, the tragic incident on January 8 underscores the need to rethink crowd management strategies at religious pilgrimage sites. As an editorial in this daily on December 27, 2024, noted, India has the highest number of religious stampedes globally. According to National Crime Records Bureau data, between 1996 and 2022, over 3,000 lives were lost in stampedes at religious events nationwide. This statistic starkly highlights the need for systemic changes in the way large-scale gatherings are organised and managed. The Tirupati stampede, which resulted in six devotees passing away and injuries to over 40 others, was despite the extensive arrangements by the Tirumala Tirupati Devasthanams (TTD) and the Andhra Pradesh government. Elaborate crowd control mechanisms, such as a well-dispersed token distribution strategy and the deployment of over 3,000 police personnel and other staff and volunteers were in place for the 10-day Vaikunta Dwara Darshan. Nonetheless, what appears to be miscommunication at one of the centres in the city to handle a surge in devotees at a token distribution centre, seems to have triggered chaos and panic. The probe that Chief Minister N. Chandrababu Naidu announced would shed more light on where the lapse occurred. The tragedy unfolded just weeks after another stampede-like situation in Hyderabad. While the TTD has been making commendable efforts over the years to streamline operations — online booking systems and additional security personnel during peak periods — the scale and the spontaneity of human behaviour at such events demand innovative solutions.

One such idea could involve prioritising pilgrims who have never visited Tirupati over repeat visitors, thereby ensuring a more equitable darshan. VIP darshans too need a rethink. A robust database and a roster system could help regulate devotee flow and ensure fairness. Additionally, there is a need to consider the ecological impact on the Tirumala Hills, which are a part of the Seshachalam Biosphere Reserve. Growing anthropogenic pressures stemming from deforestation, urbanisation, and massive footfalls pose a significant threat to its biodiversity. Balancing the human need to connect with the divine with the imperative to preserve nature requires innovative and sustainable approaches. These could include capping the number of pilgrims every day, promoting virtual darshan experiences, and enforcing stricter conservation policies. A collaborative effort between religious and government authorities, environmental experts, and the public is essential to create a framework that prioritises safety, accessibility, and ecological preservation.

KUMBH ORIGIN, HISTORY, APPEAL

Maha Kumbh Mela Mythology, History, Astrology: It is cold in Prayagraj, foggy with a chance of rain. Yet, on Monday (January 13), tens of thousands are expected to arrive in the city, to camp on the banks of the Ganga. They will stay in tents and bathe in the river, the most devout taking a dip at dawn while stars are still twinkling.



- Prayagraj is hosting the Maha Kumbh this time, or the Poorna Kumbh, held every 12 years. Many myths are prevalent around the Kumbh Mela, many theories about its exact origin. Some believe the festival finds mention in the Vedas and Puranas.

- Some say it is far more recent, going back barely two centuries. What is known for certain is that today, it is one of the largest gatherings of devotees witnessed anywhere on earth.

- The Sanskrit word kumbh means pitcher, or pot. The story goes that when Devas (gods) and Asuras (loosely translated as demons) churned the ocean, Dhanvantri emerged carrying a pitcher of amrita, or the elixir of immortality.

—To make sure the Asuras don't get it, Indra's son, Jayant, ran off with the pot. The Sun, his son Shani, Brihaspati (the planet Jupiter), and the Moon went along to protect him and the pot. As Jayant ran, the amrita spilt at four spots: Haridwar, Prayagraj, Ujjain, and Nashik-Trimbakeshwar. —He ran for 12 days, and as one day of the Devas is equal to one year of humans, Kumbh Mela is celebrated at these locations every 12 years, based on the relative positions of the Sun, the Moon, and Jupiter.

- Prayagraj and Haridwar also hold the Ardh-Kumbh (ardh means half), every six years. The festival held after 12 years is called the Poorna Kumbh, or the Maha Kumbh.

- All four places are located on the banks of rivers — Haridwar has the Ganga, Prayagraj is the sangam or meeting point of Ganga, Yamuna and the mythical Saraswati, Ujjain has the Kshipra, and Nashik-Trimbakeshwar the Godavari.

- It is believed that taking a dip in these rivers during Kumbh, amid the specific alignment of the heavenly bodies, washes away one's sins and accrues punya (spiritual merit).

- Kumbh Melas are also the venue where Sadhus and other holy men gather — the sadhu akhadaas attracting a lot of curiosity — and regular people can meet them and learn from them.

- The site of a Kumbh Mela depends on astrological calculations. Another reason for the 12-year gap in Kumbh Melas is explained by the fact that Jupiter takes 12 years to complete on revolution around the Sun.

Do You Know:

- While some come for only one ritual dip in the river to wash away sins, many, termed kalpwasi, stay at the riverbank, to take a break from the daily fight of earning material resources and earn spiritual credit instead. Many give daan, or donations of various kinds, here.

- With any large crowd comes the chance of commerce, and the Mela has also served as a market crucial to local communities. Historically, there are records of Venetian coins and European toys being spotted at the Mela markets.

- The various sadhu akhadaas set up camp. They go for baths, called shahi snan, in elaborate processions. In the past, tussle over which sadhu akhadaa is important enough to bathe first has led to bloody battles, so now, an order is generally pre-decided.



BENGAL GOVT. ANNOUNCES NEW INITIATIVES TO ATTRACT PILGRIMS TO GANGASAGAR MELA

Competing with the Maha Kumbh at Prayagraj, the organisers of the Gangasagar Mela, held at the confluence of the Ganga with the Bay of Bengal in West Bengal, on Sunday announced a slew of initiatives, including a certificate for pilgrims participating in the annual pilgrimage.

A number of Ministers of the West Bengal government, led by Power Minister Aroop Biswas, held a press conference announcing the Bandhan initiative for pilgrims visiting the site in availing a certificate in three languages.

Other initiatives include the e-Anushandhan (pilgrims can access facilities at the mela ground) and e-Parichay (QR code-enabled identity band) to prevent missing people in the mela crowd. "So far, about 42 lakh pilgrims have visited the island," Mr. Biswas said, expressing hope that the number of pilgrims would cross the record of one crore set in 2023.

While claims of the number of pilgrims visiting the ecologically fragile island during the Makar Sankranti festival is contested by Opposition political parties, Chief Minister Mamata Banerjee has been pushing for a "national mela" status for the Gangasagar Mela for several years.

Earlier this month, Ms. Banerjee had said that the Union government supported the Kumbh Mela but did not extend any support to the Gangasagar Mela.

The State government also organises 'Ganga Aarti' every year during the mela, much like the event held at the ghats of Varanasi.

This year, the 'Ganga Aarti' is being organised from January 11 to January 13.

In separate incidents, one person died and two others were airlifted after they fell ill at the Gangasagar Mela.

TRAIN TO KASHMIR SOON AS LAST LEG OF PROJECT GETS SAFETY NOD

The rail link to Kashmir is now ready to commence operations, said officials Wednesday, as the Commissioner of Railway Safety (CRS) greenlit the ambitious project's final leg — the 17-km Katra-Reasi section.

- The inspection by the CRS, the railway safety audit body under the Ministry of Civil Aviation, is the final check before train operations can begin.
- "For the Katra-Reasi stretch of the Udhampur-Srinagar-Baramulla rail link, a detailed investigation was conducted, especially because of its topography and terrain, and authorisation was granted to the Northern Railway. There was no lacuna found in the project, the infrastructure is outstanding. Now, the entire link is getting connected and the dream of a train to Kashmir will come true soon," said Dinesh Chand Deshwal, CRS, Northern Circle.
- Due to security concerns, trains will run only during the day on this route, said a source.
- Railway ministry officials said the CRS on Tuesday also approved a maximum speed of 85 km per hour for trains running between Shri Vaishno Devi Dham Katra and Reasi stations.



- DEMUs and MEMUs are self-propelled train rakes — that is, they have no separate locomotives — that run on short- and medium-distance routes in India.

Do You Know:

- The Kashmir line, or the Udhampur-Srinagar-Baramulla project, was sanctioned in 1994-95. The first three phases were completed by 2014. Trains have been running between Banihal and Baramulla in the Kashmir valley, and between Jammu, Udhampur and Katra in Jammu region. But the 111-km Katra-Banihal section was the most difficult to construct owing to the challenging terrain.
- A 48-km section from Banihal to Sangaldan was commissioned in February 2024 and the 46-km Sangaldan-Reasi section received CRS authorisation on July 1.
- Katra to Reasi is the final leg that has been constructed, and has now received the CRS approval.
- The Banihal-Katra section contains 97 km of tunnels and 7 km of bridges. “The toughest challenge in the project was to give foundation support to the world’s highest arch bridge (359 metres) on the Chenab River.
- It was achieved by a rock-bolting method using 30,000 tonnes of steel. The other main challenge was to build India’s first cable-stayed bridge on the Anji River. The two other bridges on the section are Reasi and Bakkal bridges.
- The longest tunnel in this section of the Udhampur-Srinagar-Baramulla Rail Link project is 12.77 km long.
- Officials said cameras have been placed every 50 metres in tunnels to keep an eye on operational safety. The Railways has also built 215 km of roads in the region to access the project sites.
- The first train that will run on the stretch will be an eight-coach Jammu-Kashmir Vande Bharat train, designed to operate in temperatures as low as -20°C.

DENOTIFIED TRIBES’ ANGER GROWING AMID A STAGNATING SCHEME, CLASSIFICATION ISSUES

With the Centre’s SEED scheme for denotified tribes only now taking off, caste certificates being denied to them in 29 States, and the Idate Commission’s 2017 report in cold storage, anger among the denotified tribes (DNT), semi-nomadic tribes (SNT), and nomadic tribes (NT) is growing across States such as Uttar Pradesh, Haryana, and Gujarat. This anger is now also frustrating members of the Union government’s Development and Welfare Board for DNTs, SNTs, and NTs (DWBDNC), who are making fresh attempts to push for the implementation of the Idate panel recommendations, which include a permanent commission, proper classification, and a detailed caste census.

The government had constituted the National Commission for DNTs/NTs/SNTs in 2015 under the chairmanship of Bhiku Ramji Idate, which had put out its final report in 2017, calling for the government to expedite the final classification of these communities, count their population by including a caste census column in the 2021 census, and provide a sub-quota for them under SC/ST/OBC quotas in public education and employment. The Idate commission had concluded there were a total of 1,526 DNT, NT, and SNT communities across the country, of which 269 were not yet categorised as SC, ST, or OBC.

4TH FLOOR SHATABDI TOWER, SAKCHI, JAMSHEDPUR



Certificates sought

B.K. Lodhi, who was Member Secretary in the Idate Commission and is now part of the Vimukt, Ghumantu, and Ardh-Ghumantu Janjatiya Vikas Parishad (Akhil Bharatiya) in Uttar Pradesh, said, “We were the first to resist British rulers and branded criminal for it. How can this government not sort out these basic issues like DNT certificates across States?”

Uttar Pradesh is among the seven States that technically have begun issuing DNT community certificates. But Dr. Lodhi, who attended the national workshop in New Delhi last week, said, “They are saying they have issued some 200-300 certificates and painting it as some huge achievement. It strikes at a core area, denying our identity. If the government cannot get States to issue DNT certificates, they might as well brand us criminal again, at least we will get our identity.”

Welfare measures

The SEED scheme (Scheme for the Economic Empowerment of DNT/NT/SNT communities) was meant to be the Centre’s flagship scheme for these communities. Launched in February 2022, the scheme offered assistance for livelihood, education, healthcare, and housing. But it took over two years for the scheme to take off.

In a meeting of top officials, chaired by Social Justice Minister Virendra Kumar last month, the government had resolved to urge States and UTs to start issuing DNT certification along with regular caste certificates.

“The Minister has assured us of action but there are real concerns about the lack of implementation of the Idate Commission’s recommendations. So many people are not getting community certificates because of belonging to sub-castes, or spelling it differently, or having a hyphenated caste name,” Mr. Patni said.

AGASTHYAR’S LEGACY TO BE THE FOCUS OF KASHI TAMIL SANGAMAM 3.0

Union Education Minister Dharmendra Pradhan on Wednesday announced that the main theme of the third edition of Kashi Tamil Sangamam, a cultural exchange programme scheduled to be held from February 14 to 25, will be Rishi Agastya.

• A total of 1,200 participants are expected this year. Of them, 200 will be Tamil students from central institutions. Farmers, teachers, writers, small entrepreneurs, innovators, and women from self-help groups — all from Tamil Nadu — will also be part of the event. An online registration portal has been launched, and the selection of participants will be done through a quiz. Seminars and cultural programmes will be held during the programme. Participants will visit Varanasi, Prayagraj, and Ayodhya, and with the event coinciding with the Maha Kumbh, they will also visit the Kumbh.

Do You Know:

- The first edition of the programme, which is organised by the Ministry of Education, was held in 2022, and it is meant to mark the bond in terms of civilisation and culture between Varanasi and Tamil Nadu.
- Legend has it that King Parakrama Pandya, ruler of the region around Madurai in the 15th century, wanted to build a grand temple dedicated to Lord Shiva. He travelled all the way to Kashi to bring back the lingam for his temple.

4TH FLOOR SHATABDI TOWER, SAKCHI, JAMSHEDPUR



While returning, he stopped to rest under a tree. When he tried to continue his journey, the cow carrying the lingam refused to budge from its spot. Parakrama Pandya understood this to be the Lord's wish, and installed the lingam there, a place that today is known as Sivakasi. For devotees who could not visit Kashi, the Pandyas also built the Kasi Viswanathar Temple in what is today Tenkasi in southwestern Tamil Nadu.

- Dr Vinay Kumar of the Department of Ancient Indian History, Culture and Archaeology, at Banaras Hindu University (BHU), the connection between Kashi and the Tamil region is deep and old. "Much later, another king, Adhivir Ram Pandyan, after returning from a pilgrimage to Kashi, constructed another Shiva temple in Tenkasi in the 19th century," Dr Kumar said. There's more: "Sant Kumara Gurupara from Thoothukudi district had negotiated with the princely state of Kashi to get a place for the consecration of Kedarghat and Vishvesvaralingam in Varanasi. He also composed Kashi Kalambagam, a collection of grammar poems on Kashi," Dr Kumar said.
- Ek Bharat Shreshtha Bharat programme aims to enhance interaction & promote mutual understanding between people of different states/UTs through the concept of state/UT pairing. The states carry out activities to promote a sustained and structured cultural connect in the areas of language learning, culture, traditions & music, tourism & cuisine, sports and sharing of best practices, etc.
- States/UTs in India have been paired with each other for a fixed time period. The paired States/UTs signed MoUs with each other, delineating a set of activities that they would carry out. An activity calendar for each pair was prepared through mutual consultation, paving the way for a systematic process of mutual engagement. Such interaction between different segments of the population of each pair of States /UTs at the cultural level, generated the vibrance of understanding & appreciation amongst the people and forged mutual bonding, thus securing an enriched value system of unity in the nation.

RAJASTHAN RIVER-LINK LIFELINE COULD SUBMERGE 37 SQ KM IN TIGER RESERVE

THE flagship river-link irrigation project, which will provide a lifeline to 23 districts in Rajasthan, envisages the submergence of 37 sq km in the Ranthambhore tiger reserve effectively cutting it into two sections, according to project documents reviewed by The Indian Express.

- The submergence will be caused by the largest dam proposed under the Parbati-Kalisindh-Chambal-Eastern Rajasthan Canal Project (PKC-ERCP), which is part of the ambitious Interlinking of Rivers (ILR) program.
- The canal project is expected to channel surplus water of the Chambal river basin for irrigation, drinking and industrial use to 23 districts of Rajasthan, benefitting 3.45 crore people.
- Of the PKC-ERCP's total submergence area of 408.86 sq km in Rajasthan, 227 sq km will go under the reservoir of a proposed 39-m-high and 1.6-km-long dam across Banas river, a tributary of Chambal, near village Doongri, about 30 km from Sawai Madhopur town.
- Of this, project details show, 37.03 sq km belong to Ranthambhore national park (392 sq km) and Keladevi wildlife sanctuary (674 sq km), both part of the Ranthambhore tiger reserve (1,113 sq km), currently home to 57 tigers.
- The submergence on both sides of the proposed dam will constrict the north-south animal dispersal route between the two halves of the reserve (see map).



- The move has renewed calls for “high-value forests” to be avoided while designing dams, with conservationists saying this section of the project will “adversely impact” the iconic reserve’s habitat connectivity and carrying capacity.

- Incidentally, Ranthambhore is the third tiger reserve facing loss of land to upcoming reservoirs. The North Koel Reservoir Project will submerge 10.07 sq km of Palamu tiger reserve in Jharkhand; the Ken-Betwa river link project is expected to drown 41.41 sq km of Panna tiger reserve in Madhya Pradesh.

Do You Know:

- In 2017, Rajasthan under the then chief minister Vasundhara Raje conceived the Eastern Rajasthan Canal Project (ERCP). However, the project was not acceptable to Madhya Pradesh, which also shares the Chambal river basin, due to the high volume of water extraction planned by Rajasthan.

- Soon after the BJP returned to power in Rajasthan in December 2023, the Centre combined the Parbati-Kalisindh-Chambal (PKC) Link project, which was pending implementation in Madhya Pradesh, with Rajasthan’s ERCP as PKC-ERCP.

- The two states signed an MoU with the Centre for the modified project last January. While the ERCP segment has already been planned by Rajasthan, the project is now undergoing capacity enhancement due to the linking of Parbati, Kalisindh and Chambal (PKC) rivers, necessitating a modified DPR.

- The revised DPR of the Rajasthan segment of the PKC-ERCP will be submitted to the Central Water Commission by mid-January, said Rakesh Gupta, MD, Eastern Rajasthan Canal Project Corporation Ltd, which is under the Rajasthan government.

- A former royal hunting ground, Ranthambhore was declared a tiger reserve in 1974. Over the decades, it has emerged as one of the few strongholds of India’s national animal and the world’s favourite tiger destination.

- Phase One of the PKC-ERCP involves the construction of the Doongri dam and five barrages — Ramgarh, Mahalpur, Navnera, Mej, and Rathod on the river Kul, Parbati, Kalisindh, Me] and Banas, respectively — a water conductor system from Ramgarh barrage to Doongri dam and the renovation of Isarda dam. In Madhya Pradesh, the Kumbhraj dam on Parvati and the SMRS dam on Kuno are proposed. The deadline for this phase is 2028.

- The Inter-Linking of Rivers programme aims to connect various surplus rivers with deficient rivers. The idea is to divert excess water from surplus regions to deficient regions to help improve irrigation, increase water for drinking and industrial use, and mitigate drought and floods to an extent.

- The special committee was set up following a Supreme Court direction on a 2012 writ petition on ‘Networking of Rivers’. The SC directed the Centre to set up a special committee that would then constitute sub-committees. It directed the committee to submit a bi-annual report to the Cabinet on status and progress, and directed the Cabinet to take appropriate decisions.

- The status reports are meant to be in accordance with the National Perspective Plan. This plan was formulated in 1980 by the Ministry of Irrigation (now Water Resources) to look into inter-



basin transfers. The plan comprises two components: peninsular rivers development and Himalayan rivers development.

- India also has a National Water Development Agency (NWDA), which was set up in 1982, to conduct surveys and see how feasible proposals for interlinking river projects are.

ANOTHER TIGER ENTERS BENGAL, STATE SAYS WON'T RETURN IT

With another tiger entering West Bengal from neighbouring Jharkhand, state forest minister Birbaha Hansda on Sunday said that the big cat would not be returned if captured.

- This comes close on the heels of tigress Zeenat leaving a trail of panic across five West Bengal districts after wandering off from Similipal Tiger Reserve Park in neighbouring Odisha, leading to a spat between the two state governments.

- “This tiger has come from Jharkhand. It has entered Jhargram. Our forest department officials are on alert and have reached the area. Teams have been deployed... This proves that our forests are suitable for tigers and there is ample prey base or food here. That is why tigers are entering our forests from neighbouring states,” Bengal Forest Minister Birbaha Hansda said.

- In the absence of a radio collar, say experts, it is difficult to identify the home range of the tiger currently moving.

- Forest officials said the latest pugmarks of the tiger has been found in the Banspahari area of Jhargram district.

Do You Know:

- Tiger dispersals are mostly exploratory — they do not follow linear paths, and find their way around barriers such as highways, railways, canals, mines, and human habitation.

- A study of 29 tiger cubs between 2005 and 2011 in Ranthambhore found that males had a greater probability of dispersal (92.3%) than females (36.4%). Males also dispersed further (4.5-148 km) than females (4.6-25.8 km) from the area of birth.

- Typically, a male tiger's larger territory encompasses smaller territories of multiple female tigers. While related tigresses (siblings or mother-daughters) may concede space to one another in adjacent ranges, every male tiger must establish its own territory when it comes of age.

- Within the finite limits of shrinking forests, this leads to frequent duels between young pretenders and the dominating, mature males already in control of prime plots. If lucky to survive the face-offs, the vanquished flee the victor's territory.

- For old tigers, such displacement would signal impending death. But with time on their side, the young floaters must keep exploring for vacant slots and accessible tigresses. A tiger forest reaching its carrying capacity is not the only scenario when individual tigers wander outside.

- Tigers are also known to set off when moved to new locations as part of population management strategies. In Madhya Pradesh, for instance, the first male tiger shifted to Panna from Pench in 2009 started walking south, looking for its erstwhile home. It had to be recaptured. Last month, tigress Zeenat showed the same restlessness after being packed away from Tadoba (Maharashtra) to Simlipal (Odisha).



- Tigresses may also disperse to protect cubs. In 2011, a tigress walked out of Ranthambhore with its two cubs after the male that sired them was airlifted to repopulate Sariska. Wary of new males looking to kill the cubs and mate with her, the tigress took refuge in the ravines and mustard fields by the Chambal river, where the cubs did not survive too long.
- Not all dispersals have happy endings. But surplus tigers from ‘source’ reserves must fan out looking to reach low-tiger-density areas. When they succeed, fresh gene flow revitalises isolated populations. When they don’t, they die.
- Also, without adequate monitoring and necessary intervention, tiger dispersals through non-forest areas and human habitations may fuel man-animal conflict, eroding the goodwill the national animal banks on. Dispersal routes popular with tigers indicate the potential for developing and protecting new habitats and corridors so that the big cat may reclaim lost ground.
- According to the latest all-India tiger estimate, one-fifth of India’s tiger area spanning 16 tiger reserves harbours only 25 — or less than 1% — of India’s 3,682 tigers.

28 SPOTTED DEER DOT EVERY SQ. KM OF NAGARAHOLE TIGER RESERVE IN KARNATAKA

Wildlife spotting at any reserve is a matter of time, luck, and patience. But those visiting the Nagarahole Tiger Reserve in Karnataka will most likely catch a glimpse of the spotted deer. Officials of the reserve say their population has seen a steady increase in recent years. At present, there are 28 spotted deer for every sq. km of the reserve.

The Nagarahole Tiger Reserve is located in the districts of Mysuru and Kodagu. It has an area of 847.981 sq. km, including a core area of 643.392 sq. km and a buffer area of 204.589 sq. km. The reserve is contiguous with the Wayanad Wildlife Sanctuary in Kerala to the south and Bandipur Tiger Reserve to the southeast.

According to the reserve, these forests in the Western Ghats play host to many carnivores and herbivores, including tiger, leopard, Asiatic wild dog, sloth bear, Asiatic elephant, gaur, sambar, chital, four-horned antelope, and South-western langur, among others.

Seema. P.A., Deputy Conservator of Forests and Director of Nagarahole Tiger Reserve, told *The Hindu* that the increasing deer population is a sign of healthy prey-predator numbers. “Deer population is good in Nagarahole compared to other tiger reserves. It has been increasing for a few years. Prey and predator - both are balanced,” she said. She also said the reserve had 142 tigers as of the 2023 census, the third-highest population in India.

Another official from the reserve said among the factors contributing to the population is the availability of grass and food, which is good for prey density and predator base. The official also said the terrain in the reserve is not entirely hilly and has a variety of forest types, from scrub to evergreen, which helps with the population.

SHORT NEWS

ISRAEL-HAMAS DEAL

— Mediators in Doha, Qatar, have agreed on a phased ceasefire deal in Gaza on the following terms:



— During a 42-day first phase beginning Sunday, Hamas will release 33 hostages and Israel will release between 900 and 1,650 Palestinian detainees, including all of those detained since October 7, 2023.

— The Israel Defense Forces (IDF) will withdraw from central Gaza and the Netzarim Corridor — a 2-4-km-wide security clearing that it has created, cutting Gaza in half up to the Mediterranean — and eventually from the Philadelphi Corridor, the buffer zone along the Gaza-Egypt border.

— Negotiations for a second phase will begin on the 16th day after the ceasefire comes into effect, and is expected to produce almost a full Israeli withdrawal from the Strip, and the release of all remaining hostages by Hamas in return for a yet-to-be-decided number of Palestinian detainees.

— In the third phase, border crossings will be reopened fully, and reconstruction will begin in Gaza.

UN Committee of Experts on Big Data and Data Science for Official Statistics

— India has joined the UN Committee of Experts on Big Data and Data Science for Official Statistics (UN-CEBD), which underscores the country's growing stature in the global statistical community and highlights its commitment to leveraging data and technology for informed decision-making.

— The UN-CEBD was created to further investigate the benefits and challenges of Big Data, including the potential for monitoring and reporting on sustainable development goals.

— India will contribute to shaping global standards and practices in harnessing Big Data and data science for official statistical purposes. India's engagement will highlight its pioneering initiatives, including the establishment of the Data Innovation Lab.

BHARAT RANBHOO MI DARSHAN

— On the occasion of the 77th Army Day (15th January), Defence Minister Rajnath Singh launched the "Bharat Ranbhoomi Darshan" which is a dedicated website for visitors, including information on the 77 sites, their stories, and how to get there.

— The Bharat Ranbhoomi Darshan website will be a one-stop destination for visitors to make all necessary arrangements for their travel planning, including how to apply for permits for some of these places, officials add.

— The website will feature details on various battlefields and border areas, offering virtual tours, historical narratives, and interactive content. The sites will also be highlighted by the Tourism Ministry as part of the Incredible India campaign.

INDIAN ARMY DAY 2025

— Indian Army Day is observed every year on January 15 to honour the bravery and sacrifices of soldiers who dedicated their lives to protecting the country.

— The theme for the 77th Army Day 2025 is '*Samarth Bharat, Saksham Sena*' (Capable India, Empowered Army), reflecting the Indian Army's commitment to national strength and defence capabilities.

— This is the first time the all-women Agniveer contingent participated in the Army Day parade.

4TH FLOOR SHATABDI TOWER, SAKCHI, JAMSHEDPUR



— Also, Pune hosted the Army Day parade for the first time. This is the third occasion on which a city other than New Delhi has hosted the Army Day Parade, keeping in line with the Union government's decision to hold events of national importance outside the national capital.

— The day commemorates the occasion when General (later Field Marshal) K M Cariappa took over the command of the Indian Army from General Sir F R R Bucher, the last British Commander-in-Chief, in 1949 and became the first Indian Commander-in-Chief of Independent India.

ARMED FORCES VETERANS' DAY

— The Armed Forces Veterans' Day is celebrated every year on January 14 across India to pay respects to the armed forces veterans for their selfless duty and sacrifices and to reinforce solidarity towards the next of kin of the Bravehearts.

— The first Armed Forces Veterans Day was organised on January 14, 2017, as a pan-India event under the purview of the Ministry of Defence. The aim was to salute the unwavering dedication and sacrifices of tri-services veterans while standing in solidarity with their families.

— January 14 was chosen to be celebrated as Veterans' Day as it was on this day in 1953 when Field Marshal KM Cariappa, the first Commander-in-Chief of the Indian Army post-independence, retired after glorious service to the nation and became a veteran.

NATIONAL STARTUP DAY

— National Startup Day is an annual observance in India on January 16, dedicated to recognising and promoting the vibrant startup ecosystem.

— During the inaugural Startup India Innovation Week, on January 15, 2016, PM Modi announced the commemoration of Startup Day on January 16, to recognise the economic contributions made by entrepreneurs in India during the first Startup India Innovation Week.

— As a result, since 2022, National Startup Day has been commemorated every year on January 16.

— National Startup Day aims to create a supportive environment for entrepreneurial ventures while celebrating startups' crucial role in stimulating economic development and job creation.

— To commemorate the day, **Udyamotsav 2025** is organised. It is a platform designed to empower student entrepreneurs by facilitating their engagement with the investor community, organised by the Ministry of Education.

— It will enable student entrepreneurs to pitch their startups, seek funding, and receive mentorship on business models and scaling strategies, taking place across 14 Indian cities.

DATA LOCALISATION

— During an IT Ministry organised consultation with the tech industry on the recently released draft data protection rules 2025, a few concerns stood out: apprehensions over data localisation, consent verification and behavioural tracking of children, and worries over cross-border data flows to foreign jurisdictions.



— Under data localisation, the companies are required to store a copy of certain sensitive personal data – like health and financial data – within India, and the export of undefined “critical” personal data from the country is prohibited.

INTERNATIONAL YEAR OF GLACIERS’ PRESERVATION (IYGP) 2025

— The United Nations declared 2025 as the International Year of Glaciers’ Preservation. It has also proclaimed the 21st March of each year as the World Day for Glaciers starting in 2025.

— The objective is to raise global awareness about the critical role of glaciers, snow, and ice in the climate system and the hydrological cycle, and the economic, social, and environmental impacts of the impending changes in the Earth’s cryosphere.

PINK FIRE RETARDANT

— As multiple wildfires continue to torch Southern California, authorities are using planes to drop a large amount of bright pink fire retardant to curb the blaze.

— Fire retardant is a mix of chemicals used to extinguish or slow down the spread of fires. There are different types of fire retardant but to tackle wildfires in the US, authorities most commonly use **Phos-Chek** — a brand of fire retardant — which mostly contains an ammonium phosphate-based slurry.

— Typically, it is made of salts such as ammonium polyphosphate, which does not evaporate easily like water and stays for longer. Colour is usually added to the fire retardant to ensure that firefighters can see it against the landscape.

— Environmental experts have said that spraying fire retardants using planes is ineffective, expensive and a growing source of pollution for rivers and streams.

— These toxic metals include chromium and cadmium which can cause cancer, and kidney and liver diseases in humans. However, their adverse impact on the environment is of more concern, especially when retardants enter waterways.

RING OF FIRE

— A strong earthquake with a preliminary magnitude of 6.9 hit the Kyushu region in southwestern Japan on January 13. Japan’s position along the “*Ring of Fire*” makes it vulnerable to frequent earthquakes.

— The Ring of Fire is a string of hundreds of volcanoes and earthquake sites that runs along the Pacific Ocean. It is shaped like a semicircle or horseshoe and stretches nearly 40,250 kilometres.

— The Ring of Fire traces the meeting points of numerous tectonic plates, including the Eurasian, North American, Juan de Fuca, Cocos, Caribbean, Nazca, Antarctic, Indian, Australian, Philippine, and other smaller plates, which all encircle the large Pacific Plate, according to a report by National Geographic.



— Japan experiences earthquakes due to the interactions of four tectonic plates — the *Pacific Plate*, the *Philippine Sea Plate*, the *Okhotsk Plate* and the *Eurasian Plate*.

— The existence of volcanoes in the Ring of Fire is also due to the movement of tectonic plates. Many of the volcanoes have been formed through a process known as subduction. It takes place when two plates collide with each other and the heavier plate is shoved under another, creating a deep trench.

FIREFLY

— India's space tech startup Pixxel has launched the country's first private satellite constellation, named Firefly, marking a major milestone in the country's space exploration journey.

— Firefly is Pixxel's flagship hyperspectral imaging satellite constellation, featuring six of the highest-resolution commercial hyperspectral satellites to date. It has launched three of its six hyperspectral imaging satellites aboard a SpaceX rocket from California.

— The satellites aim to use hyperspectral imaging, a technology that captures highly detailed data across hundreds of light bands to serve industries such as agriculture, mining, environmental monitoring, and defence.

THIRD LAUNCH PAD

— The Union Cabinet on January 16 approved the setting up of a third launchpad at the Satish Dhawan Space Center (SDSC) in Sriharikota — a spindle-shaped island on the east coast of Andhra Pradesh.

— The new launchpad will help the Indian Space Research Organisation (Isro) to become future ready to use the heavier Next Generation Launch Vehicle (NGLV) that it is currently developing.

— The SDSC is the country's only spaceport from which spacecraft and satellites are launched.

INS SURAT

— The final and fourth ship of the P15B Guided Missile Destroyer Project, is recognised as one of the world's largest and most sophisticated destroyers. The other three are INS Visakhapatnam, INS Mormugao, and INS Imphal. These are named after the major cities in the four corners of the country.

— A contract for the construction of four guided missile destroyers under the project codenamed 15B was signed in January 2011.

— INS Surat is the Indian Navy's first AI (artificial intelligence) enabled warship, which will utilise indigenously developed AI solutions to enhance its operational efficiency manifold.

— Destroyers are a category of warships that have high speed and manoeuvrability, greater strike capability, and longer endurance, because of which they are a key asset in various types of naval operations, mainly offensive.



INS NILGIRI

- The Nilgiri-class stealth frigate, built under the codename Project 17A, is a follow-on vessel of the Shivalik class or Project 17 frigates that are currently in service.
- INS Nilgiri is the first of seven frigates in Project 17A being built by Mazagon Dock Shipbuilders Limited (MDL), Mumbai, and Garden Reach Shipbuilders and Engineers (GRSE), Kolkata.
- The multi-mission frigates are capable of operating in a “blue water” environment — in the deep seas far from the coast — and deal with both conventional and non-conventional threats.
- The ships are fitted with a supersonic surface-to-surface missile system, a Medium Range Surface-to-Air Missiles (MRSAM) system, a 76 millimetre upgraded gun, and a combination of rapid-fire close-in weapon systems.
- The other six ships of this class — Himgiri, Taragiri, Udaygiri, Dunagiri, Mahendragiri, and Vindhyagiri — are at various stages of construction at MDL, Mumbai, and GRSE, Kolkata. They are named after hill ranges in India.

INS VAGHSHEER

- INS Vaghsheer is the sixth and final submarine of the modern stealthy Kalvari class built under Project 75.
- The design of the Kalvari class of submarines is based on the Scorpene class designed and developed by the French defence major Naval Group (formerly DCNS), and the Spanish state-owned entity Navantia.
- They have diesel electric transmission systems and are primarily “attack” or “hunter-killer” submarines — which means they are designed to target and sink adversary naval vessels.
- The submarines are armed with wire-guided torpedoes, anti-ship missiles, and advanced sonar systems, and feature modular construction that allows for future upgrades such as the integration of Air Independent Propulsion (AIP) technology.
- The submarines in the current Kalvari class take their names from now-decommissioned classes of submarines named Kalvari — including Kalvari, Khanderi, Karanj — and the Vela class, which included Vela, Vagir, Vagshir.
- Vaghsheer is named after a type of sandfish found in the Indian Ocean.

KERCH STRAIT

- An emergency task force arrived in Russia’s southern Krasnodar region as an oil spill in the Kerch Strait from two storm-stricken tankers continues to spread a month after it was first detected, officials said.
- Kerch Strait separates the Russia-occupied Crimean Peninsula from the Krasnodar region.
- The Kerch Strait is an important global shipping route, providing passage from the inland Sea of Azov to the Black Sea. It has also been a key point of conflict between Russia and Ukraine after Moscow annexed the peninsula in 2014.



TARUN DAS

- President of Singapore Tharman Shanmugaratnam bestowed the highest honour of the city-state on Tarun Das, the former director general of the Confederation of the Indian Industry (CII).
- He is the second Indian to receive the honour with the late Ratan Tata being the only other Indian recipient of the award before this. The award has been given for his contributions to promoting bilateral relations between Singapore and India.
- Singapore is India's largest trade partner in ASEAN and a leading source of FDI. There is active collaboration between India and Singapore to establish skill development centres in various sectors.

NANOSHIP:

According to a dating app, nanoship is small, yet meaningful interactions. It is a connection that is pregnant with all sorts of possibilities but not weighed down by any of them.

PLANET PARADE:

A 'planet parade' refers to a situation when several planets in our solar system are visible in the night sky, at the same time. It is not a technical term in astronomy.



DreamIAS



BUSINESS & ECONOMICS

BESSENT TOUGH TALK ON RUSSIA OIL: HOW COULD INDIA BE IMPACTED?

Scott Bessent, United States President-elect Donald Trump's pick for Treasury Secretary, said on Thursday that the Joe Biden administration had been "too weak" on Russia's oil sector, and that he was ready to tighten sanctions further — a statement that pushed up global oil prices.

- On January 10, the Biden administration announced fresh curbs against Russia's oil trade, placing as many as 183 tankers, constituting the bulk of the so-called "shadow fleet" delivering to customers such as India and China, under sanctions.
- Unlike earlier sanctions on Russian entities, which were relatively easier to circumvent, the new action is far more targeted, and will hurt Indian imports of Russian oil, government officials said.
- While other sources of oil are available to India, there are obvious advantages, in terms of reliability and cheaper rates, in imports from Russia, officials said.
- India, the world's third-largest consumer of crude oil, depends on imports to meet more than 85% of its requirement. Russia was a marginal supplier before the war in Ukraine began in February 2022; it is now India's biggest supplier of crude. In 2024, Russian oil accounted for nearly 38% of India's total oil imports, according to tanker data.
- Tighter sanctions on Russian oil will also complicate India's efforts to internationalise the rupee.
- India and Russia have been in talks to settle a portion of the oil trade in the domestic currency. While the rupee trade has not taken off as desired, similar efforts have worked in China's case — the booming Russia-China trade in non-dollar exchange has helped the yuan increase its footprint globally.
- During his Senate hearing, Bessent said that the US dollar "should" remain the world's reserve currency. Trump had earlier threatened Brazil, Russia, India, China, and South Africa (BRICS nations) with 100% tariffs if they created a new BRICS currency or backed any other to replace the US dollar as the world's reserve currency.
- International trade experts have noted that the attempts to move away from the dollar began after the US threw Russia out of the Society for Worldwide Interbank Financial Telecommunication (SWIFT), the key to international financial transactions, in 2022.

Do You Know:

- Internationalisation is a process that involves increasing the use of the rupee in cross-border transactions.
- It involves promoting the rupee for import and export trade and then other current account transactions, followed by its use in capital account transactions. These are all transactions between residents in India and non-residents.
- The internationalisation of the currency, which is closely interlinked with the nation's economic progress, requires further opening up of the currency settlement and a strong swap and forex market.



- More importantly, it will require full convertibility of the currency on the capital account and cross-border transfer of funds without any restrictions. India has allowed only full convertibility on the current account as of now.
- Currently, the US dollar, the Euro, the Japanese yen and the pound sterling are the leading reserve currencies in the world. China's efforts to make its currency renminbi has met with only limited success so far.
- The use of the rupee in cross-border transactions mitigates currency risk for Indian businesses. Protection from currency volatility not only reduces the cost of doing business, it also enables better growth of business, improving the chances for Indian businesses to grow globally.

CHINA'S POPULATION DECLINES FOR THIRD CONSECUTIVE YEAR, STRAINING ECONOMY

China's population fell last year for the third straight year, its government said on Friday, pointing to further demographic challenges for the world's second most populous nation, which is now facing an ageing population and an emerging shortage of working age people.

China's population stood at 1.408 billion at the end of 2024, a decline of 1.39 million from the previous year.

The figures announced by the government in Beijing follow trends worldwide, but especially in East Asia, where Japan, South Korea and other nations have seen their birth rates plummet. China three years ago joined Japan and most of Eastern Europe among other nations whose population is falling. The reasons are in many cases similar: rising costs of living are causing young people to put off or rule out marriage and child birth while pursuing higher education and careers. While people are living longer, that's not enough to keep up with rate of new births.

Lopsided sex ratio

Countries such as China that allow very little immigration are especially at risk. China also has a lopsided sex ratio, with as many as millions more boys born for every 100 girls, raising the possibility of social instability among China's army of bachelors. Friday's report gave the sex imbalance as 104.34 men to every 100 women, though independent groups give the imbalance as considerably higher.

More disturbing for the government was the drastically falling birthrate, with China's total population dropping for the first time in decades in 2023 and China being narrowly overtaken by India as the world's most populous nation in the same year. A rapidly aging population, declining workforce, lack of consumer markets and migration abroad are putting the system under severe pressure.

NEW US AI EXPORT LAW EXCLUDES INDIA FROM ITS CLOSEST ALLIES. WHAT COULD BE ITS IMPACT?

Days before demitting office, the Joe Biden administration has released an expansive regulatory framework on the export of artificial intelligence (AI) hardware such as graphics processing units (GPUs), which could have far-reaching consequences for India's AI ambitions.



- In an “interim final rule”, titled ‘Framework for Artificial Intelligence Diffusion,’ the US government has proposed to create three tiers of countries with specific restrictions on the export of AI chips and GPUs for each.
- India is in the middle tier of this classification and will face some restrictions on the number of GPUs it can import from the United States. That could impact the ongoing process of procuring 10,000 GPUs to build up India’s domestic AI computing capacity.
- The first tier, which includes 18 of the closest allies of the United States, has almost no export restrictions.
- The third tier has countries of concern to the US, to which the export of technology is all but prohibited.
- The rules seem intended to keep advanced chips and AI models under the control of the US and its closest allies. Their enforcement, however, will depend on the incoming administration of President Donald Trump.
- Apart from this tiered classification, the law also envisions a special review called the General Validated End User. This list includes only two countries: India and China. Indian companies that get this authorisation can use the exported items for civilian and military purposes, but not for nuclear use. Chinese companies with this authorisation can only use the technology for civilian use.

Do You Know:

The three tiers of countries are:

- TIER 1: The first tier comprises 18 of the closest allies of the US: Australia, Belgium, Canada, Denmark, Finland, France, Germany, Ireland, Italy, Japan, the Netherlands, New Zealand, Norway, South Korea, Spain, Sweden, Taiwan, and the United Kingdom.

—US companies can deploy as much computing power as they like in these countries, and the security requirements are relatively straightforward.

- TIER 2: The vast majority of countries in the world, including India, are in this category. These countries will face a limit on how much computing power they can import from American companies, unless that computing power is hosted in trusted and secure environments. —There are caps on the levels of computing power that can go to each of these countries: roughly around 50,000 advanced AI chips through 2027, although that can double if the state reaches an agreement with the US.

—India is trying to procure 10,000 GPUs for its IndiaAI Mission, and it remains to be seen how this classification could impact large companies looking to build large AI data centres. Smaller firms are not likely to be impacted.

- TIER 3: Export of US technology to these countries – including Russia, China, Libya, North Korea etc. – will be almost prohibited.



CABINET OKS SETTING UP OF 8TH PAY COMMISSION

A year before the end of the 7th Pay Commission, the Government has decided to set up the 8th Pay Commission in 2026. The decision was made during a meeting of the Union cabinet chaired by Prime Minister Narendra Modi on Thursday morning, Union minister Ashwini Vaishnaw announced.

- The minister also told reporters that the chairman and two members of the commission would be appointed soon. The 7th Pay Commission was established in 2016 and its term will conclude on December 31, 2025. Vaishnaw said that initiating the process a year ahead would allow sufficient time to receive and review recommendations before the 7th Pay Commission's completion.
- The recommendations of the 7th Pay Commission were implemented in January 2016 by the Modi government. The 4th, 5th and 6th Pay Commissions also had 10-year terms. The recommendations included a salary hike of 14 per cent for government officials.
- The chairman of the 7th Pay Commission is Justice Ashok Kumar Mathur.

Do You Know:

- A Pay Commission, set up by the government of India, decides the salary and compensation of Central government staffers and allowances of pensioners. The 8th Pay Commission will recommend revisions in the salary and pension structure of the beneficiaries, resulting in a hike in the remuneration and allowances.
- There are over 49 lakh central government employees and nearly 65 lakh pensioners, news agency PTI reported.
- As the 7th Pay Commission's term concludes in December 2025, initiating the process now ensures sufficient time to receive and review recommendations before its completion, Vaishnaw said. He further said the setting up of the new Pay Commission in 2025 will ensure that its recommendations are received well before the completion of the term of the seventh pay panel.
- Pay commissions consult with central and state governments, along with other stakeholders, before recommending salary structures, benefits, and allowances for government employees. Their recommendations are often adopted by state-owned organisations.
- The implementation of the pay commission's recommendations results in increased consumption and economic growth, with an improved quality of life for government employees. Generally, every 10 years, the central government implements a pay commission to revise employee remuneration.
- The commission also suggests formulas for revising dearness allowance and dearness relief for central government employees and pensioners, aiming to offset the impact of inflation.
- Since 1947, seven Pay Commissions have been constituted, with the last one constituted in 2014 and implemented on January 1, 2016. The 7th pay commission saw an expenditure increase of Rs 1 lakh crore for fiscal 2016-17.



- Under the 7th Pay Commission, employee unions had demanded a fitment factor of 3.68 for salary revision of employees but the government set the fitment factor at 2.57. The fitment factor is a multiplier used for calculating salaries and pensions.
- Based on the fitment factor revision, the minimum basic pay for central government employees rose to Rs 18,000 per month, up from Rs 7,000, registering a 2.57-fold increase. Likewise, the minimum pension of retirees increased from Rs 3,500 to Rs 9,000. The maximum salary of serving employees was revised to Rs 2,50,000 and the maximum pension was fixed at Rs 1,25,000, taking into consideration the fitment factor of 2.57.

THE IMPACTS OF RUPEE WEAKENING

The Indian rupee recently registered a sharp devaluation with respect to the dollar after remaining stable for over two years or so. What explains such a phenomenon? What are the implications? This article aims to address these issues by discussing India's exchange rate policy and highlighting a few structural constraints in the Indian economy in the recent period.

Exchange rate regimes

The nominal exchange rate is the price of buying one unit of foreign currency in terms of domestic currency. The way in which the nominal exchange rate changes depends both on the demand-supply conditions of the foreign exchange market and the exchange rate policy of the central bank.

The real exchange rate is the relative price of foreign goods in terms of the domestic currency with respect to the prices of the domestic goods. It describes how cheap or costly domestic goods are concerning the foreign goods.

The demand and supply conditions of the foreign exchange market depend on the flows of the current account and capital account. The demand for foreign currency would rise if the sum of net current account and capital account flows falls, whereas the supply of foreign currency would rise if the sum increases. The net current account flows are largely influenced by the net exports, whereas net capital account flows are influenced by the net flows of foreign investments. The lower the net exports and greater the capital outflow, the greater would be demand for foreign currency and vice-versa.

Depending on how the central bank responds to the demand and supply conditions in the foreign exchange market, there can be broadly three kinds of exchange rate policy frameworks — fixed exchange rate, floating exchange rate, and managed-floating exchange rate regimes.

In the fixed exchange rate regime, the central bank responds to the higher demand for foreign currency entirely by selling (decumulating) foreign exchange reserves (and vice versa), while keeping the nominal exchange rate fixed at a predetermined level.

In the floating exchange rate regime, the central bank responds to higher demand of foreign currency entirely by devaluing the domestic foreign currency (making foreign currency costlier in terms of domestic currency) and vice versa, while keeping the level of foreign exchange reserves unchanged.

In the managed-floating exchange rate regime, the central bank responds to higher demand for foreign currency both by selling foreign currency as well as devaluing the domestic foreign currency.



Barring a few brief episodes, India has largely pursued a managed-float exchange rate regime in the last three decades. The last decade has been characterised by the Reserve Bank of India (RBI) pursuing a particular variant of managed-float exchange rate regime, where its response under excess demand conditions in the foreign exchange market has been qualitatively different from excess supply conditions. Under excess demand conditions in the foreign exchange market, the RBI has simultaneously devalued the domestic currency and decumulated its foreign exchange reserves. However, under excess supply conditions, the RBI accumulated foreign exchange reserves while largely resisting appreciation of the nominal exchange rate to avoid appreciation of the real exchange rate or the worsening of export competitiveness. By implication, while episodes of net capital outflow were associated with depreciation of the nominal exchange rate, the episodes of net capital inflow did not involve appreciation of the exchange rate to the same extent. This asymmetry in the behaviour of the nominal exchange rate led to an overall devaluation of the rupee throughout the 2010s decade.

In the post-COVID period, particularly between the latter half of 2022 and November 2024, the RBI momentarily shifted its policy stance to a regime that closely resembles the fixed exchange rate regime. This is reflected by the flat segment of the dollar exchange rate in Figure 1 during the relevant period. Deterioration of the current account deficit and capital outflow during this period were met by selling foreign exchange reserves while holding the nominal exchange rate more or less at the same level. The sharp devaluation of the rupee in the last month or so hints towards RBI returning to its earlier regime of the managed-float exchange rate that it followed during the 2010s. Responding to greater capital outflow and a rise in imports amid higher crude oil prices, the RBI allowed the rupee to depreciate with the objective of putting less strain on the foreign exchange reserves.

Implications of devaluation

Depreciation of the nominal exchange rate can have at least two macroeconomic implications — positive and adverse. The first route involves the real exchange rate channel, whereas the second route involves the prices of domestic goods.

Cheapening domestic goods opens up the possibility of increasing net exports. For example, if the nominal dollar exchange rate is ₹85, the dollar price of foreign goods is \$100 and the rupee price of domestic goods is ₹1,000, then the prices of foreign goods in terms of the domestic currency would be ₹850 and the real exchange rate would be 0.85.

First, a depreciation in the nominal exchange rate can positively influence net exports and output if two conditions hold simultaneously: (i) the net exports respond positively to the real exchange rate and (ii) depreciation in the nominal exchange rate is associated with depreciation in the real exchange rate. A rise in domestic prices at a given nominal exchange rate would lead to an appreciation of the real exchange rate by making domestic goods costlier, whereas a depreciation of the nominal exchange rate at unchanged domestic prices would lead to a depreciation of the real exchange rate by making domestic goods cheaper with respect to foreign goods.

Second, a depreciation in the nominal exchange rate can increase domestic prices by increasing the variable cost of firms and putting a greater squeeze on real income. In oligopolistic markets, firms typically set their prices by setting a markup over their variable cost. Since the variable cost of firms typically includes the cost of imported raw materials, nominal exchange rate depreciation would increase the variable cost of firms by increasing their effective cost of imported raw



materials. The consequent rise in variable costs leads to higher prices when the firms pass on the burden of higher raw material costs to the final consumers.

The central constraint that emerged in the Indian economy since the latter half of the 2010s, however, was that the condition for the positive effect of nominal exchange rate depreciation ceased to hold.

The recent constraint

The period since the mid-2010s, particularly 2019 has been characterised by the growing divergence between the nominal and the real exchange rate. These indices reflect the weighted average exchange rate of India with respect to its multiple trade partners. The way in which these indices are defined, any increase or positive change of these indicators implies appreciation, and any decrease or negative change implies depreciation. After moving in the same direction till the mid-2010s, they started moving in opposite directions with the real exchange rate registering an appreciation despite a depreciation in the nominal exchange rate. Such a phenomenon distinguishes India from the bulk of the other countries.

Depending on how both NEER and REER changed during this period, countries can be divided into four boxes or categories. Category 1 includes countries where both nominal and real exchange rates registered appreciation. Category 2 includes countries where the real exchange rate appreciated despite the depreciation in the nominal exchange rate. Category 3 countries are those which registered depreciation in both nominal and real exchange rates. Category 4 countries are those which registered depreciation in the real exchange rate despite the appreciation in the nominal exchange rate.

The figure shows at least two important features of the global economy during this period. First, the majority of countries have been located in categories 1 and 3, indicating that the nominal and real exchange rates have moved in the same direction for most countries. Second, India parted company with most countries since 2019, as it is located in category 2.

Such appreciation of the real exchange rate in India despite a depreciation of the nominal exchange rate indicates that the latter has been associated with counteracting rise in domestic prices.

The markup can be estimated as the ratio between the output price and the variable cost per unit of output or the ratio between the nominal value of sales and the total variable cost. The variable costs in this estimation include the expenses on raw materials, packaging, power, and fuel, compensation to employees, indirect taxes, distribution, and outsourcing. After registering a decline till the mid-2010s, the markup reversed its trend and started rising. Since prices are formed by a markup over variable costs, any rise in markup would push up domestic prices at any given level of variable costs and nominal exchange rate.

The policy question

While the weakening of the rupee puts pressure on the prices, the delinking of the real exchange rate from the nominal exchange rate has posed additional constraints on the recovery of net exports and the balance of payments adjustment mechanism. This leads to the larger questions for the exchange rate policy — should India return to the earlier strategy of the 2010s, or does it require a new and explicit exchange rate policy framework? What should the exchange rate policy aim to achieve?



The response of the RBI in the post-COVID period has appeared somewhat arbitrary, as it has frequently shuffled its policy stance without providing adequate explanation. The recent challenges bring forth the need to address these questions in a more systematic way.

INDIA'S REAL GROWTH RATE AND THE FORECAST

The First Advance Estimates (FAE) of National Accounts for 2024-25 show a real GDP growth of 6.4% and a nominal GDP growth of 9.7%. These numbers have fallen short of the Reserve Bank of India's revised growth estimate of 6.6% for real GDP, as in its December 2024 monetary policy statement and 10.5% for nominal GDP growth as in the 2024-25 Union Budget presented in July 2024.

The annual growth of 6.4% can be seen as consisting of 6% growth in the first half and 6.7% growth in the second half. There is, thus, a clear improvement expected over the Q2 growth of 5.4%. The sharp fall in 2024-25 annual GDP growth from that of the previous year at 8.2% is seen only in the case of GDP. With respect to Gross Value Added (GVA), this difference, between 7.2% and 6.4%, is much less. On the GVA side, it was the manufacturing sector which suffered a sharp fall in sectoral growth from 9.9% in 2023-24 to 5.3% in 2024-25.

Growth prospects for 2025-26

The Gross Fixed Capital Formation rate at constant prices has ranged between 33.3% and 33.5% during 2021-22 to 2024-25. Thus, it appears to have stabilised around 33.4%. It is expected to continue at this level in 2025-26. The average Incremental Capital Output Ratio (ICOR) has been marginally higher than 5 in recent years. Assuming ICOR to be 5.1 in 2025-26, we may consider a 6.5% real GDP growth to be realistic.

There may not be much change in the global economy even though Donald Trump's assumption of office may create more uncertainty. India will have to largely depend on domestic demand.

In particular, the Government of India has to ensure that there is no relaxation in its investment expenditure. In fact, the slightly lower growth in 2024-25 is largely linked to the slowdown in the Government of India's investment growth which has remained negative at (-)12.3% even after eight months into the fiscal year.

With a lower nominal GDP growth in 2024-25 of 9.7% as compared to the budgeted nominal GDP growth of 10.5%, the budgeted Gross Tax Revenue (GTR) of ₹38.4 lakh crore may not be realised if the budgeted buoyancy of 1.03 is maintained. As per Controller General of Accounts (CGA) data, GTR growth for the first eight months was 10.7%. If this growth is maintained for the remaining months also, the realised buoyancy would be about 1.1, which is higher than the budgeted buoyancy. In such a case, tax revenue shortfall will be minimal. In other words, any revenue constraint or likely pressure on fiscal deficit would not constrain the government's ability to achieve its capital expenditure target of ₹11.1 lakh crore.

Reason for the dip

However, after the first eight months, the level of the Government of India's capital expenditure has remained limited to ₹5.14 lakh crore, that is 46.2% of the Budget target. In the remaining four months, the Government of India's capital expenditure may be accelerated. It may still fall well short of the target. This has been the main reason for the dip in overall real GDP growth in 2024-25.



Going forward in 2025-26, the Government of India will have to continue to rely on an accelerated capital expenditure growth which can be kept at least at 20% on the revised estimates for 2024-25. Sustained government capital expenditures can have a favourable effect on private investment. The size and the pattern of investment expenditure of the government should be designed to accelerate private investment as well.

Medium- to long-term growth prospects

Over a period of next five years, the best that India may hope for is a steady real GDP growth rate of 6.5%. This is in line with the International Monetary Fund's real GDP growth projection for the Indian economy, as in its October 2024 release, which is at 6.5% over the period 2025-26 to 2029-30. This real GDP growth may be accompanied by an implicit price deflator (IPD)-based inflation of about 4% which can give a nominal GDP growth in the range of 10.5%-11%. In years in which global conditions improve and the contribution of net exports to GDP growth becomes significant, real GDP growth may touch even 7%. If a real growth of around 6.5% and a nominal growth in the range of 10.5%-11% are maintained over the long run with an average exchange rate depreciation of 2.5% per annum, India should be able to reach a per capita GDP level consistent with a developed country status in the next two and half decades. But the task is not going to be easy. It will be hard to grow at 6.5% as the base keeps on increasing. In fact, in the earlier years, the growth rate will have to be higher. But, at present, the potential rate of growth appears to be 6.5%. However, it can change.

In the light of a potential growth rate of 6.5%, the achievement of 6.4% in 2024-25 should not be considered as disappointing. In fact, the achievement of 8.2% in 2023-24 should be considered as a flash in the pan. The current year's growth rate of 6.4% as in the first advance estimates should be seen in the context of India's potential growth rate.

NOTHING CYCLICAL ABOUT IT

Pratap Bhanu Mehta writes: India's growth slowdown is a signal of declining confidence in government

- The downward revision of India's growth prospects to 6.4 per cent in FY 25, down from 8.2 per cent, the lowest growth forecast since the pandemic, should be dominating the news cycle.
- Growth is often indeed cyclical. But in Indian official economic discourse, the term cyclical is not an analytical word. It is a word of evasion. If the slowdown were cyclical in a genuine economic sense, it would have been anticipated. But we had to drastically revise down our own projections. This suggests that we have a very weak underlying analytical and data framework for the conditions under which we think the cycle will be up or down.
- But the faith in "cyclical" is a fatalistic evasion. We still have a "monsoon" economy mindset. Like the seasons, the economy will correct itself. Perhaps this is appropriate for an economy where good rain and modest agriculture growth in this cycle have saved us from what might have otherwise been a bigger slump.
- Capital formation in the private sector has been expanding at a snail's pace for close to a decade now.
- High net worth individuals continue to flee India; private consumption is virtually stagnant, wages are stagnant, there is a slump in manufacturing, household savings are declining, the



middle class is squeezed, small retail loan defaults are rising, albeit from a small base; India's cash-rich large companies seem to struggle for investible projects. Three and a half decades after liberalisation, India is still massively reliant on public spending and the monsoon to shore up growth. This is an astonishing thought.

Do You Know:

- From a regulatory point of view, the government's four cardinal sins are —first, renegeing on minimum government maximum governance. Admittedly, this is a complex issue. But there is an almost offensive insensitivity in the finance ministry to concerns about needless regulatory confusion and complexity, whether in taxation or GST. And defenders of the prime minister will often blame it on the bureaucrats. This is a bad move, it makes the government look weak and evasive.

—Second, the sheen is now off the government on corruption. There was always going to be centralised and wholesale corruption: The demands of political finance make that inevitable. But the reputation for retail corruption at the level of transactions is back with a vengeance.

—Third, there is diminishing confidence that India's political economy will push for real reform. The government is quite comfortable with a political economy of growth for the top 10 per cent, combined with gestures of a "welfare architecture" for the bottom; Indian capital has made its Faustian bargain with the state.

—Finally, and this must be repeated ad nauseam, India's capital concentration and championing of three or four large players is sucking out the competition and energy of India's private sector. The fear of any moderately successful enterprise that it can be "expropriated" to benefit existing big players is real. This a conscious choice the government has made,

INFLATION MATRIX

In the final inflation print before the Union Budget for 2025-26 is presented, followed by the first review of the monetary policy led by the new Governor of the Reserve Bank of India (RBI) in early February, the price rise faced by Indian consumers eased to 5.22% in December. Although a four-month low, this still marked only a mild decline from November's 5.5% uptick in the Consumer Price Index (CPI), and was largely driven by a sequential easing in food prices. Food inflation moderated from over 9% in the previous month to 8.4% last month, and though inflation in vegetables cooled from 29.3% to 26.6%, it still remained generally high. Households still forked out a lot more for their meals than they did a year ago — it must be recalled that overall inflation was 5.7% and food price rise, over 9.5% in December 2023. While prices of some food items, including vegetables, are seen cooling further this month, those of a few critical ingredients have started spiking, including of edible oils, that rose at a 33-month high pace of 14.6% in December. Eggs, meat and fruits also saw inflation accelerating last month along with the relatively humble potato (up 68.2%). Moreover, inflation in wholesale prices has gained pace, signalling that there is room for higher costs to be passed on to consumers for food items as well as manufactured products.

The government and industry want the RBI to cut interest rates to reinvigorate consumption and fading growth impulses by looking through 'volatile' food inflation. But even industry captains admit that just keeping food prices out of the interest rates and growth-inflation balancing act will not suffice. Moreover, even if the weightage for food in the CPI is reduced in line with the recent



household consumption spending survey results, food price trends have a material impact on the spending propensity of households and their inflation expectations. Inflation may yet average 4.5% through January to March, as the RBI expects, but the central bank that has committed to await a durable alignment to its 4% goal before slashing rates, has a difficult call to make in February. Tangible measures, if any, to ease price pressures in the Budget, along with some visibility on the Centre's fiscal glide path, could help tip the scales for a rate cut cycle to begin soon, if not next month. There are a few new imponderables that have compounded the trade-off matrix for policymakers in North Block as well as Mint Street — the swift unravelling of the rupee vis-à-vis the dollar in recent weeks which raises the risk of importing inflation, among other collateral effects, especially as global oil prices have resurged to multi-month highs. A very nuanced approach is imperative to avoid fresh missteps.

WHAT WENT WRONG WITH GOLD IMPORT FIGURES? WHY IS REVISION BEFORE THE BUDGET CRUCIAL?

An unusual 331% year-on-year surge in gold imports during November 2024 — which had an impact on the domestic currency almost hitting its all-time low against the US dollar — and subsequent redflags raised by the gold industry has forced the government to undertake a broad-based process of comparing and matching trade data from multiple sources, including tax collection data, to verify accuracy.

This initial reconciliation effort involving imports between April and November resulted in one of the steepest revisions of gold import figures in the recent past. For November alone, the gold import figures were revised down by \$5 billion, and cumulatively between April and November, the import figures were revised down by \$12 billion to \$37 billion.

This revision was officially attributed to a problem in a data migration process that commenced in July last year. It was discovered subsequently that an error occurred due to the transition of the data transmission mechanism from the Special Economic Zone (SEZ) to the Indian Customs Electronic Gateway (ICEGATE), leading to “double counting” in the case of gold imports.

The revision comes just weeks ahead of the Union Budget presentation, and assumes significance, as gold imports had been rising to record levels ever since the duty on gold was slashed from 15% to 6% in the last Budget. This had led to calls for tightening the rates in the upcoming Budget to help limit the widening trade deficit, which has contributed to the weakening rupee.

Industry fear of increase in gold duty amid high imports

The likely increase in gold duty rates in the upcoming Budget, based on inaccurate data, could have hurt the labour-intensive gems and jewellery industries, for which gold is a key input material. During what would normally be a strong period for exports driven by festive demand, gems and jewellery exports slipped by 13% in November.

This decline comes as the jewellery industry is already facing challenges on both the demand and supply sides. Weak demand in Europe and China has curtailed exports to these lucrative markets, while sanctions on Russia due to the Ukraine war have created difficulties in accessing rough diamonds.

The correction in the data, therefore, reduces the chances of an increase in the gold import duty in the upcoming Budget, as the revised numbers suggest that gold imports from January to November 2024 are below the annual average of 800 tonnes.



‘200 tonnes of gold smuggled on average’

To be sure, high duties on gold have always been an ineffective revenue strategy, as they lead to an increase in gold smuggling in the country. Even at a 6% duty on gold, Delhi customs last month intercepted a passenger attempting to smuggle gold in their rectum.

Up to one-quarter of the total volume of gold entering India is believed to come via illicit trade, according to a report from the Indian Institute of Management Ahmedabad (IIMA) on gold smuggling, which suggests that up to 200 tonnes of gold is being smuggled into the country. India imports around 800–900 tonnes of gold every year, while the annual consumption is around 1,000 tonnes, according to the report,

‘Gold data double counting’

In its official explanation of the counting error, the Ministry of Commerce and Industry stated that data from the Commerce Ministry and the Finance Ministry had been reconciled. During the data migration process, it was discovered that an error occurred due to the transition of the data transmission mechanism from the Special Economic Zone (SEZ) to the Indian Customs Electronic Gateway (ICEGATE). The transition came into effect on 1 July.

The Ministry clarified that the figures for precious metals required revision, as it was found that the system had been counting both imports into the SEZ and subsequent clearances into the Domestic Tariff Area (DTA) as separate transactions after the migration, due to a “technical glitch.”

‘Migration still not complete’

The Ministry of Commerce stated that, due to the persistence of “certain technical glitches”, the migration is still not complete, and both SEZ Online and ICEGATE continue to capture and transmit mutually exclusive EXIM data to DGCIS.

The Ministry confirmed that the revision had been made for trade figures from April 2024 to November 2024, which are published in accordance with the regular publication cycle maintained under international standards for data dissemination. It further stated that a committee had been formed with stakeholders from DGCIS, DG Systems (CBIC), and SEZs to establish a robust mechanism for publishing consistent data.

ARE LITHIUM BATTERIES ON FLIGHTS DANGEROUS?

The story so far:

On January 2, the International Federation of Air Line Pilots’ Associations (IFALPA) issued three position papers on the fire risk due to the use of lithium-ion batteries in airport and aircraft settings. The papers are motivated by air operators’ increasing use of electric vehicles (EVs) and lithium-ion batteries as well as the batteries becoming more energy-dense.

What is IFALPA?

The IFALPA is a global nonprofit representing the international community of professional pilots. After the Second World War, the UN established the International Civil Aviation Organisation (ICAO) in 1947 to coordinate air transport and its principles worldwide. A year later, ICAO organised a conference in London where pilots could interact with its leaders. The IFALPA was born at this event with 13 pilots’ associations. According to a source on the ICAO website, IFALPA



encompassed 104 member associations representing one lakh professional pilots worldwide around 2013. Per the same source, “The belief [is] that the unique perspective of pilots operating in scheduled flying would be of significant benefit to the creation and adaptation of ICAO Standards and Recommended Practices (SARPs) through which ICAO regulates international civil aviation.” The IFALPA also provides inputs to the International Air Transport Association, the Airports Council International, and the International Federation of Air Traffic Controllers’ Association.

Why are there fears about lithium batteries?

Almost every major industry in the world is mechanised to a significant degree, and the energy for these machines has traditionally been produced by burning fossil fuels. As climate mitigation has become more pressing, industries are under pressure to replace this thermal energy — the principal cause of global warming — with electric energy.

For example, EVs draw electric energy from a battery to drive an electric motor and supply kinetic energy to the wheels. In an internal combustion engine, heat energy released by burning fossil fuel moves pistons, whose motion is converted to rotary motion of the wheels.

Lithium-ion batteries have emerged as a popular solution to storing electric energy because they are energy-dense, rechargeable, and can be made in almost any shape, which is useful when there are space constraints as onboard an aircraft. But lithium-ion batteries have been known to catch fire when they are subjected to certain physical stresses.

The fire is the result of the stress creating a short-circuit inside the battery, leaving it to keep producing electric current, heat, and oxygen. The battery’s internal components can become corroded while the risk of catching fire increases. The short circuit can be the result of mechanical, electric, and/or thermal abuse, which respectively deforms the internal structure, degrades its electric performance, and causes heat to accumulate.

For example, after Hurricane Helene struck the U.S. in November 2024, 48 lithium-ion batteries reportedly caught fire.

University of South Carolina mechanical engineer Xinyu Huang said they may have been the result of EV batteries rarely being rated to be waterproof when they are sitting in salt water for more than 30 minutes. Such situations are more likely to occur during flooding, which is becoming more common due to climate change and poor urban planning.

What do the IFALPA papers say?

The three position papers are numbered POS01, POS02, and POS03. POS02 and POS03 are more general whereas POS01 is more specific.

POS02 is motivated by the different kind of fires caused by lithium-ion batteries (compared to internal combustion engines). As Mr. Xinyu wrote, “When a lithium-ion battery pack bursts into flames, it releases toxic fumes, burns violently and is extremely hard to put out. Frequently, firefighters’ only option is to let it burn out by itself.” The position paper thus asks “airports, rescue and fire-fighting services, operators, and ground service providers” to acquire or develop purpose-built fire-safety equipment and protocols.

POS03 extends these concerns to the flight deck — the area colloquially called the “cockpit” in civilian aircraft — where the batteries may be present in components required to operate the



aircraft. It also calls attention to studies by the U.S. Federal Aviation Administration and the European Union Aviation Safety Agency finding that existing fire kits couldn't respond adequately to fires of lithium-ion batteries with an energy rating of 100 Wh or higher.

POS01 is concerned with the safe transport of lithium-ion batteries, especially UN regulations 3480 and 3481. Since the UN classifies these batteries as "miscellaneous dangerous goods", the regulations specify the packaging and labelling standards required to transport them by air. UN3480 applies to lithium-ion batteries transported in bulk and UN3481 to lithium-ion batteries fit inside some equipment that's being transported in bulk.

One difference between the two regulations is that UN3480 requires the batteries to be charged to less than 30%, also known as state of charge (SOC) 30%, whereas UN3481 doesn't. POS01 contends that UN3481 didn't adopt this restriction because it assumed manufacturers would install safeguards in the equipment to prevent a fire from one battery spreading to others. But as the energy density of batteries and the number of settings in which they are used is increasing and the size of the equipment that uses them is shrinking, IFALPA's position is that the SOC 30% limit should be extended to UN3481 as well.



DreamIAS



LIFE & SCIENCE

GATES IN THE SKY

On December 30, 2024, the Indian Space Research Organisation (ISRO) launched its PSLV-C60 mission. Its primary payload was a pair of satellites for the Space Docking Experiment, or SpaDeX, to demonstrate orbital rendezvous and docking. The ability to execute it in orbit is an essential stepping stone to more complex missions. The launch was also hailed as ISRO ending the year on a high, but SpaDeX reminded us that sophisticated spaceflight missions care little for arbitrary deadlines. The satellites successfully docked on January 16 after a few abortive attempts. They were expected to dock on January 7, which ISRO postponed to January 9, then brought them close without docking on January 12 in an apparent data-taking effort. It nixed the January 9 attempt after the satellites were found to have drifted more than expected, prompting measures to arrest the displacement and reinitialise the experiment. Once docked, ISRO began tests to verify if the satellites could exchange electric power, then undock and separate, followed by testing their own payloads that would be spread over two years. The C60 mission also launched the fourth stage of the rocket as an orbital platform. It carried 24 payloads from various ISRO centres and private enterprises testing various technologies. The Vikram Sarabhai Space Centre's Compact Research module for Orbital Plant Studies was able to have cowpea seeds germinate in orbit, capturing the popular imagination.

Docking allows spacefaring components to be launched separately and assembled in space to form a larger module. This allows a space agency to plan interplanetary missions whose spacecraft are heavier than what the heaviest rockets can launch. Docking is thus a symbolic gateway to new opportunities, with the Chandrayaan-4 lunar sample return mission being a good example. In anticipation, ISRO loaded the SpaDeX satellites with enough fuel for multiple tries and also continuously collected data. Its own nervousness became evident, too: after the first two attempts, it backed down from its promise to live-stream the successful one. Docking technology has become desirable thanks to the perceived inevitability of long-duration spaceflight. The pressure to lower costs imposed by, say, crewed missions to Mars or space-mining operations has rendered ideas such as in-space satellite servicing and orbital resupply platforms, both of which require docking, more lucrative. ISRO plans to start launching the 'Bharatiya Antariksh Station' (BAS) later this decade. As it embarks on a new phase of operations, with V. Narayanan as its new chairman, ISRO should also describe a coherent vision for the ex ante utility expected of BAS. Without this context, the larger pieces of the Indian space programme and their purpose relative to other countries' plans seem adrift.

SATELLITES DOCK IN SPACE, ISRO GETS A BOOST FOR MOON & BEYOND

The Indian Space Research Organisation (ISRO) on Thursday (January 16) morning successfully demonstrated space docking — or the joining of two fast-moving satellites in space.

- With the successful docking of the two satellites — Chaser and Target — as part of the Space Docking Experiment (SpaDeX), India has become the fourth country after the US, Russia and China to accomplish the feat.
- “SpaDeX has accomplished the unbelievable ... and it is all (using the) indigenous Bharatiya Docking System. This paves the way for smooth conduct of ambitious future missions including



the Bharatiya Antriksha Station, Chandrayaan 4 and Gaganyaan,” Union Science Minister Dr Jitendra Singh said.

- Docking refers to joining together two or more fast-moving objects in space. Most larger space assets, particularly those that involve two-way journeys, from and to Earth, are made of several parts that are taken one at a time and integrated in space.
- Space facilities like the International Space Station, as big as a typical six-bedroom house in the United States, cannot be launched into space at one go. Similarly, spacecraft taking humans to the Moon are composed of multiple components. A part of the spacecraft has to detach and land on the Moon, and then re-integrate on the return journey.
- Satellites in space move at very high speeds, thousands of kilometres per hour. For docking to happen, they have to move at exactly the same speed, so that relative to each other, they are almost stationary. Docking, thus, is an extremely complicated process requiring very high precision manoeuvres. The smallest of errors can lead to complete destruction of the satellites
- The SpaDeX mission consisted of two relatively small spacecraft, called Target and Chaser, each weighing about 220 kg, that were launched together into space. They were injected with slightly different force to allow them to attain a separation of about 20 km, while keeping them in the same orbit around Earth, about 470 km from the surface.
- The satellites were then brought progressively closer, in stages, before being docked together on Thursday morning. The two satellites which carry several scientific payloads will eventually be undocked and fulfil their science objectives over the next two years.

HOW AND WHY ARE PLANTS GROWN IN SPACE: TAKEAWAYS FROM ISRO'S SUCCESS

The lobia (black-eyed pea) seeds that the Indian Space Research Organisation (ISRO) sent to space on December 30 as a part of its Compact Research Module for Orbital Plant Studies (CROPS) germinated last week.

- As humans venture out on lengthy space missions to colonise celestial bodies like Mars and the Moon, space-grown plants can provide a sustainable food source. With minimal scope of restocking supplies, astronauts cannot simply rely on a limited stock of multivitamins during missions that may go on for years. Besides, pre-packaged vitamins break down and lose their nutritive value over long periods of time.
- The most significant challenge is microgravity, the condition in which people or objects appear to be weightless.

The lack of gravity precludes plants' roots from growing downwards, in addition to making nutrient delivery a difficult task. Since water tends to cling to any surface it touches in microgravity, when sprayed onto the base of a plant, it does not trickle down to the roots where it would be absorbed.

- Plants grown in space also need to be protected from the high levels of radiation that can damage their DNA and hinder growth, and insulated from temperature fluctuations — often hundreds of degrees — that are normal in space, Pandey said.



Light conditions, especially in the outer Solar System where sunlight is scarce, pose another challenge. Without light, photosynthesis stops, and plants begin to consume more oxygen than they produce.

Do You Know:

- CROPS stands for Compact Research Module for Orbital Plant Studies which is an unmanned experimental module designed to develop ISRO's capabilities for growing and sustaining plants in space.
- CROPS first mission (CROPS – 1) is designed to demonstrate germination of a seed and growth of plant up to two leaves stage in space. It is an airtight container of diameter 300mm and height 450mm simulating earth like environment in space except gravity.
- A neutral clay soil medium in pellet form having high porosity to absorb and retain water is used in CROPS – 1 for the seed to spread its roots. The soil medium can be sterilized by heating at high temperature to neutralize microbes, fungus, spores etc. without losing any of its functional properties. The soil is premixed with a slow release fertilizer (activated by water) in a measured quantity to provide nutrients to the plant in a controlled manner over a period of time. The soil is tightly packed in four chambers (with two seeds each) covered by a silicon foam layer followed by a cover plate on the top to provide sufficient compression to the soil.
- Each seed is pasted on to a polypropylene tissue and glued together using an organic gum. This gum holds the seed rigidly in position until it is wetted by water. The seed also has to be thoroughly sterilized using ethanol before pasting to avoid contamination. The pasted tissue strip is inserted into the soil medium through a slit in the silicon foam and the cover plate. This mechanism of seed fixing helps the seed to survive the high vibrations and shock levels experienced during launch.

CONQUERING THE MOON

In *Orbital*, Samantha Harvey's 2024 Booker Prize-winning novel, the exhilarating distance of space evokes a sobering realisation in her six astronaut protagonists: "The planet is shaped by the sheer amazing force of human want, which has changed everything, the forests, the poles, the reservoirs, the glaciers, the rivers, the seas, the mountains, the coastlines, the skies, a planet contoured and landscaped by want." Going by the World Monuments Fund (WMF), the international body dedicated to the conservation of cultural heritage, it appears that the Earth is not the only celestial body scarred by human desire. On the day that India successfully docked two satellites in space, the WMF's list of threatened cultural sites saw an extra-terrestrial addition — the Moon. In particular, Tranquility Base, Apollo 11's landing site and other associated areas.

In 1969, when Neil Armstrong and Buzz Aldrin first stepped on the Moon, it marked a triumph of imagination and ambition. It was a moment that framed the technological aspirations of the 20th century, affirming the belief that human ingenuity could overcome the greatest odds. But the Moon landing was also the beginning of a geopolitical race. In the years since, burgeoning commercialisation of space exploration, including private space tourism, has raised a philosophical dilemma: Where does curiosity end and greed begin?

There is a counterargument, one that resists the imposition of conservation ideals on uncharted domains. The Moon is, after all, a place of scientific opportunity. The challenge, then, is not just about how the Moon's heritage is preserved, but over its reconciliation with human ambitions.

4TH FLOOR SHATABDI TOWER, SAKCHI, JAMSHEDPUR



The WMF's intervention comes as an invitation to deliberate on how progress and preservation can coexist in a world of ever-expanding frontiers.

'STRANGE' PARTICLE POSSESSES MASS WHEN MOVING IN ONE DIRECTION, NOT ANOTHER

Since the start of the 20th century, physicists have discovered a veritable zoo of subatomic particles. Matter can be both wave and particle. If you take the particle route, these subatomic particles are what you could say the universe and everything in it is made of. There are many ways to further categorise them.

A common one is as fermions and bosons: fermions make up matter and bosons mediate the forces between matter. For example, electrons and protons are fermions whereas photons are bosons.

Fermions can be further classified as Dirac or Majorana fermions. Dirac fermions are fermions that may or may not have mass but are always different from their anti-particles. Majorana fermions are fermions that are also their own antiparticles (neutrinos are suspected to be Majorana fermions).

"Here strange particles can arise and be experimentally detectable, which are otherwise not usually seen in three dimensions." For example, two-dimensional materials can host particles called anyons whose properties lie somewhere between those of fermions and bosons. Recently, researchers at Columbia University and Pennsylvania State University reported finding another strange particle called a semi-Dirac fermion.

Dirac fermions have mass and aren't their own anti-particles. A semi-Dirac fermion has mass when it's moving in one particular direction but not in a perpendicular direction. This unusual characteristic, which makes semi-Dirac fermions very exotic, is the result of the fermion's interaction with the electric and magnetic forces acting on it in certain materials.

The semi-Dirac fermion reported in the experiment is technically a quasiparticle. A quasiparticle is a clump of particles or energy-packets that, in some given conditions, behaves like a single particle. Protons are quasiparticles, for example: each proton is made of three quarks and the gluons holding them together. In most settings, what separates particles from quasiparticles is a distinction without a difference. If a quasiparticle is a fermion, it's a fermion in the same way an electron is a fermion.

WHY IS META SHUTTING DOWN FACT-CHECKERS?

The story so far:

On January 7, Meta CEO Mark Zuckerberg said the company will get rid of fact-checkers and simplify content policies by removing restrictions on topics as it is "out of touch with mainstream discourse." In a five-minute video, he said that the company will return to its roots as the fact-checkers have been "too politically biased" and "destroyed more trust than they created, especially in the U.S."

How did Meta get into fact-checking?

After the 2016 U.S. presidential election results were out, Meta, then known as Facebook, faced serious backlash for amplifying political posts that helped tilt the election in favour of U.S.



President-elect Donald Trump. To build back its reputation, Facebook roped in content moderators globally and developed technology to filter harmful content.

Meta started its independent fact-checking programme in partnership with the International Fact-Checking Network (IFCN) and the European Fact-Checking Standards Network (EFCSN). Over time, Meta became one of the largest donors to IFCN.

Meta worked with fact-checkers to address misinformation on its platforms, Facebook, Instagram and Threads. While the fact-checkers worked on finding misinformation and rating them based on the seriousness of content violation, Meta followed up with action and informed users of the measures it took. Beyond fact-checking, partner organisations worked across Meta's platforms to carry out research, and rate content on a qualitative scale — false, altered, partly false, missing context, satire, and true. Per IFCN's 'State of Fact-Checkers in 2023' report, income from Meta's Third-Party Fact-Checking Programme and grants remain fact-checkers' predominant revenue streams. And 68% of fact-checking organisations have 10 or fewer employees, whereas only 6.6% employ 31 or more people.

Why was there a need for fact-checkers?

Fact-checkers play a vital role in finding false and misleading content promoted on social media platforms by domestic accounts, and at times by foreign regimes. They also played a crucial role during the COVID-19 pandemic by correcting misinformation on social platforms. If the rated content on Meta is false or altered, its distribution across Meta's apps will be reduced. If key information is missing or the content is satirical, Meta might provide the needed facts. Content rated poorly by a fact-checker may not be suggested to users, and repeat offenders could be hit with penalties such as restricted reach, being unable to monetise their content or turn their content into a news page.

What other steps were taken by Meta?

Apart from relying on fact-checkers, Meta set up an Oversight Board to adjudicate cases involving serious content policy violations. The board heard serious content violation cases and made binding decisions to uphold or overturn Meta's own actions. Gradually, Meta moved away from news content in general to keep its platform free from disinformation-prone content. The company said it will not "proactively recommend content about politics on recommendation surfaces across Instagram and Threads", noting that it wants these apps to be a "great experience" for all.

Now that is starting to change under Joel Kaplan, Meta's new chief of global affairs. Mr. Kaplan said "civic content" about elections and politics would return to the apps, and that users can choose what they want to see. He expanded on Mr. Zuckerberg's video clip, noting that the platform will also get rid of a number of restrictions "on topics like immigration and gender identity that are the subject of frequent political discourse and debate". He said, "It's not right that things can be said on TV or the floor of Congress, but not on our platforms."

What is Community Notes?

Meta will be moving towards an X platform styled content moderation system called 'Community Notes'. Under this model, instead of a centralised authority taking action against misinformation, users work together to add additional context that will appear under false or even blatantly illegal content.



The feature itself goes beyond the Elon Musk-era Twitter. It was originally conceived as Birdwatch, where users could add context to posts they see that require more information. Initially launched in 2021, the feature gained prominence in March 2022 when misinformation on the Russia-Ukraine conflict was rife on the platform.

While crowd-sourced fact-checking is seen as a better way of implementing content moderation, Community Notes can also reflect biased majority viewpoints regarding controversial subjects. The feature can also be slow, meaning false or hateful content may go viral long before the specific context is added to clarify the post. Furthermore, under X's current style of content moderation, even posts glorifying slavery and Nazism are allowed to remain online, unchallenged.

In an open letter to Mr. Zuckerberg, IFCN said, "There is no reason Community Notes couldn't co-exist with the third-party fact-checking programme; they are not mutually exclusive. A Community Notes model that works in collaboration with professional fact-checking would have strong potential as a new model for promoting accurate information."

But, Meta has decided on a hands-off approach to content moderation, by stopping its demotion of fact-checked content and removing the full-screen warnings over flagged posts. The company will focus more on illegal content and high-severity violations while adjusting content filters to make it more challenging to take down flagged content — even though this means catching "less bad stuff," as per Mr. Zuckerberg.

What is the significance of the new policy?

Mr. Zuckerberg's shift in stance comes at a time when a new Trump administration takes charge. The tech CEO dined with the President-elect at his Mar-a-Lago resort in November to repair a fraught relationship. Earlier, he publicly praised Mr. Trump's conduct after the former President survived an assassination attempt. In the video clip, Mr. Zuckerberg referenced the 2024 election as a "cultural tipping point" and committed to "restoring" free expression across Meta platforms. In essence, he was aligning his values with the new conservative government by making a clean break from the old one.

While the plan to end the fact-checking programme in 2025 applies only to the U.S., there are similar programmes Meta is running in more than 100 countries. Some of these countries are highly vulnerable to misinformation that spurs political instability, election interference, mob violence and even genocide. If Meta decides to stop the programme worldwide, it is almost certain to result in real-world harm in many places, the IFCN said in its open letter.

WELCOME, GENERATION BETA

Aristotle, Horace, bosses and parents have all complained about "kids these days". In *Paris Fashion: A Cultural History*, a republished letter from *Town & Country* magazine in 1771 reads, "A race of effeminate, self-admiring, emaciated fribbles can never have descended in a direct line from the heroes of Poitiers and Agincourt...". Recently, hustle-culture CEOs have made similar assertions. N Narayana Murthy implored young people to work "70 hours a week" last year. Into this chaos entered Generation Beta this year, which will include all children born between 2025 and 2039.

Reductive listicles that promise to give you a fixed address in a particular generation through pop-culture references reflect the impulse to categorise the young and old into neat pockets. The arrival of a new group into the workforce, or society, brings with it a bit of hope — and



apprehension over the possible disruption. The innumerable articles and surveys on whether Gen Z and Y, and X before it, make “the worst workers” are evidence. In India and across the world, cultivating the demographic dividend, that is, ensuring the young are gainfully employed and contributing to national growth and cohesion, remains an area of focus. The future rests on the shoulders of the young, after all. But the vocabulary of “generations” is woven together by vibes, not science. Of course, some experiences like wars and large technological changes inform the values of a generation. But studies have dispelled the myth that the “generation” formula is an accurate tool for identifying coherent cultural or attitudinal shifts.

As Gen Beta comes of age, it is prudent to remember that disruption is not always a bad thing. The young bring with them fresh ideas. “Kids these days” are much like the kids that came before them. For those still on the fence, a “skinny vs baggy jeans” quiz may provide clarity on the redundancy of age wars.

SNAKE ALERT

A Japanese researcher has found that a monkey’s ability to rapidly detect snakes is because of the presence of snake scales as a visual cue. The findings highlight an evolutionary adaptation of primates to identify snakes based on specific visual characteristics. In an experiment the researcher demonstrated that monkeys exhibited an immediate response to images of snakes but not to images of salamanders, implying a specific fear of snakes. On the basis of this, the researcher wondered what would happen if he edited the images of the salamanders to have snakeskin without changing anything else. When edited images of salamanders with snakeskin were shown to monkeys, they reacted to the altered images of the harmless creature equally fast, or even faster, than to the snake. The results are “consistent with the snake-detection theory that snakes were a strong selective pressure favouring modifications in the primate visual system that allow them to detect snakes more quickly or reliably”.

MOVING AWAY FROM COAL A MUST: SOUTH AFRICAN COURT UPHOLDS ‘CANCEL COAL’ CASE

Civil society organisations claimed a landmark victory against fossil fuel power in South Africa on December 4 when the High Court in Pretoria turned down the national government’s plan to add more coal-fired power stations to the country’s power grid. According to the court, the government’s plan was “inconsistent with the Constitution of the Republic of South Africa” and thus unlawful.

The ‘Cancel Coal’ case

In its Integrated Resource Plan (IRP), the government of South Africa announced in October 2019 that it plans to add 1,500 MW of coal power to the country’s national grid – 750 MW by 2023 and another 750 MW by 2027.

The Minister of Mineral Resources and Energy and the National Energy Regulator of South Africa in 2020 backed the announcement.

In 2021, youth-led civil organisations including the African Climate Alliance, the Vukani Environmental Justice Movement in Action, and the Groundwork Trust, represented by the Centre for Environmental Rights, brought the case against the government’s plan. The group alleged that



the plan would harm the environment and cause health issues, especially among children. The case soon acquired the popular monicker “Cancel Coal.”

South Africa’s energy mix

Like most economically developing nations, South Africa is heavily dependent on coal for its energy needs.

According to estimates by the International Energy Agency, almost 71% of the country’s total energy supply came from coal power in 2022.

According to an analysis of global emissions through history by Climate Watch, South Africa is the world’s 16th largest emitter of greenhouse gases.

South Africa has ratified the Paris Agreement, which means it is legally bound to cut its greenhouse gas emissions and contribute to mitigating global warming.

According to the Nationally Determined Contributions South Africa submitted in 2021, the country plans to cut 350-420 million tonnes of carbon-dioxide-equivalent (MtCO₂e) of greenhouse gas emissions by 2030. It has also committed to reaching net-zero by 2050.

In July 2024, the country’s President Cyril Ramaphosa signed the Climate Change Act into law, which includes a clause to reduce greenhouse gas emissions.

Details of the judgement

Civil society organisations contended that the government’s plan to add more coal power didn’t consider the rights of children as granted by the Constitution of South Africa.

According to the Constitution, South African citizens have the right “to have the environment protected, for the benefit of present and future generations.” This is to be ensured through measures that “prevent pollution and ecological degradation, promote conservation, secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.”

The court ruled that the Minister of Mineral Resources and Energy and the National Energy Regulator couldn’t provide enough evidence to show that the ill effects of the coal power on the environment and the health of the people, especially children, had been considered, suggesting they didn’t “comply with their constitutional obligations.”

Speaking to The Hindu, Ritwick Dutta, environmental justice lawyer and associate at Doughty Street Chambers U.K., said the order is a significant development in the field of climate litigation.

“Although, at the core, the judgment still follows the basic principles of administrative law — duty to give reasons and non-application of mind to relevant consideration — what is however significant is the fact that the court held that the minister, while according approval, did not take into account the interest of the future generations or the unborn generations.”

He also highlighted the fact that “since the Court relied on Section 28 of the South African Constitution, which requires the state to protect the child against ‘neglect and degradation’ to hold that the governments/ministers decision was not in the ‘best interest of the child’. The implication of this judgment as I see it is the requirement that a minister/government decision must not be



based on the immediate short-term need but must consider a long-term holistic view,” Mr. Dutta said.

A 2019 study published in the International Journal of Environmental Research and Public Health reviewed epidemiological literature to understand the impact of coal-fired power plant emissions on children’s health. It concluded that they affect children negatively due to their “developing physiology, anatomy, metabolism, and health behaviours.” The review also observed that children who lived near a coal-fired plant exhibited more asthma and respiratory-related conditions.

Environmental justice

The case is also an example of environmental justice in the context of transitioning away from coal worldwide.

“Even in India, for the first time three ministries — Ministry of Power, Ministry of Environment, Forest and Climate Change and the Ministry of New and Renewable Energy — jointly filed an affidavit before the Supreme Court in the case of M.K Ranjitsingh versus Union of India that India will have to move from polluting coal to wind and solar not only to ensure cleaner air but also to meet its commitment under the Paris Agreement,” Mr. Dutta said. “Coal will continue to meet the energy requirement in the short run, but it is now accepted that transition is a must if the world has to slow down climate change. The fact that courts globally are recognising this reality is ... only natural.”

The lawyer also said that even though this case is limited to coal power, combating climate crisis goes beyond it. “Judicial decisions on climate change are a recognition of both the urgency to deal with climate crisis and the fact that civil society groups and citizens have an important role to play in tackling the crisis. It should not be forgotten that the South African judgement is an outcome of litigation undertaken by three civil society groups. It is therefore crucial that the state and the judiciary are more open and receptive towards divergent views on dealing with a crisis of an unparalleled nature,” he added.

RESEARCH QUESTIONS ‘IRON DEFICIENCY’ AS KEY CAUSE OF ANAEMIA IN INDIA

The conventional wisdom that iron deficiency is the primary cause of anaemia in India may be outdated, with a host of other factors, ranging from Vitamin B12 deficiency to air pollution, influencing anaemia, says a study involving researchers from multiple institutions that was published earlier this week. Moreover, the manner in which blood is drawn for testing anaemia under public health programmes can dramatically alter estimates of the condition.

The study has appeared in the peer-reviewed *European Journal of Clinical Nutrition*.

Anaemia is caused due to a lack of enough red blood cells (RBC) or haemoglobin. The common wisdom is that insufficient iron is the culprit and is the driving force behind public policy interventions such as iron supplementation or mixing iron into staple foods (bio-fortification).

The latest official assessment of anaemia in the fifth round of the National Family Health Survey (NFHS), in 2019-2021, suggests that despite decades of policy intervention, anaemia has only gotten worse.

The latest study, funded by the Department of Biotechnology, measured venous blood haemoglobin concentrations from about 4,500 people in eight States. Overall, 34.9% of those



tested were anaemic. However, only 9% of them had what could be medically characterised as iron-deficiency anaemia; 22% of them were characterised as having anaemia from “unknown” causes.

“The major proportion of anaemia in all groups studied, was due to... unknown (and unmeasured) causes of anaemia. This could be due to deficiencies in other erythropoietic (blood-producing) nutrients like B12 or folate, or due to hemoglobinopathies, undetected blood loss, an unhygienic environment [20] or other causes like air pollution,” the authors said in their report.

The team of scientists and doctors spanned institutions such as St. John’s Medical College, Bengaluru; National Institute of Nutrition; Centre for Cellular and Molecular Biology; and Institute of Genomics and Integrative Biology.

For women aged between 15 and 49, anaemia prevalence was 41.1% in comparison with 60.8% in the NFHS-5. The prevalence of anaemia in adolescent girls (15-19 years) was 44.3% compared with 62.6% in NFHS-5.

The percentage drop in anaemia in this study compared with the NFHS could be explained by the method of blood collection, said Anura Kurpad, professor, St. John’s Medical College, and one of the authors of the study.

The NFHS relied on drawing capillary blood, or from a pinprick, compared with the more involved venous-blood draw.

AN UNLIKELY MYSTERY: STUDIES SHED NEW LIGHT ON HOW GENES ARE MADE

The likeness of identical twins can be startling. They are alike because all their genes are alike. Genes are those segments of the genome where, if changes occur, the characteristics of an organism change. Non-identical twins vary in 50% of their genes and are much less alike. Thus, genes define our individuality in many ways.

In December 2024, two research groups addressed how new genes are created. The University of Nevada, Reno, group reported its findings in *Molecular Biology and Evolution*, and the other, from the Max Planck Institute for Evolutionary Biology Plön, Germany, reported in *Genome Biology and Evolution*.

The 24 molecules

A group of 24 molecules of DNA gives identity to our 24 chromosomes. These are the chromosomes numbered 1 to 22 and the sex chromosomes X and Y. Our cells contain two sets of the genome: one derived from the mother’s egg and the other from the father’s sperm. Eggs and sperm receive only one chromosome of each pair. When they fuse and form the zygote, the latter has two sets again. The zygote then multiplies to form a baby.

The cells in human bodies possess two copies of chromosomes 1-22. Biological females have two X chromosomes, whereas biological males have an X chromosome and a Y chromosome. Identical twins arise from a single zygote, while non-identical twins arise from two zygotes produced simultaneously.

Each DNA molecule has two strands held together by bonds between compounds on the strands, called base pairs. Our genome contains 3.2 billion base pairs. A gene is typically a few-thousand base-pair-long segment of DNA.



When a gene is 'expressed,' it means a cell will transcribe the underlying base pair sequence to a molecule called messenger RNA (mRNA), and read the mRNA like a recipe to make a protein.

In the human genome, there are 20,000 protein-coding genes and 20,000 genes that cells use to create RNA that influences the expression of other genes. There are also some genes, called promoters and enhancers, which tell the cell when and where other genes are copied into mRNA.

Two compounds involved in forming the base pairs are cytosine and thymine. Sometimes the cytosine molecules bind to a methyl ion and are said to be methylated. A methylated cytosine molecule is likelier than an unmethylated one to mutate and become a thymine molecule.

Duplications create new genes

In 1970, Japanese-American biologist Susumu Ohno proposed that the main source of new genes is gene duplication. When the body's genome has two copies of the same gene, one copy can continue to provide the original function while the other is free to mutate and acquire new functions.

Ohno's proposal was simple but had one flaw: it didn't explain how the organism's cells would deal with producing twice the quantity of the same proteins as a result. Protein over-expression can lead to debilitating conditions. The University of Nevada, Reno, researchers addressed this problem.

Humans and mice last shared a common ancestor 75 million years ago. The researchers compared genes duplicated in human or mouse genomes, those duplicated in both, and those not duplicated in either.

They found the promoters of duplicated genes had more methylated DNA than the promoters of genes that hadn't been duplicated. Increased methylation would have prevented the cells from manufacturing twice as many proteins, minimising the ill effects of duplication and allowing the duplicate gene to survive long enough to acquire new functions.

The researchers reported that the higher rate of methylation also elevated the rate of mutation.

Keeping vs. chucking a gene

For a genome to retain a gene, it must have some use, or the genome allows it to mutate. But establishing a gene's usefulness is challenging.

Consider blood groups. Individuals can have one of four groups — A, B, AB or O — depending on which variants of the *ABO* gene they've inherited. If a person receives *A* and *A* or *A* and *O*, they have the A blood type. If they have *B* and *B* or *B* and *O*, they have the B blood type. If they have *A* and *B* or *O* and *O*, then they have the AB or the O blood types, respectively.

In sum, every individual lacks either one or two of the variants, which means no variant is really essential. The *O* variant also encodes a protein with no known function and whose amino acid sequence is markedly different from those encoded by *A* and *B*.

Primates and humans took different branches on the tree of evolution millions of years ago but share blood types — which is to say evolution both found a way and saw fit to retain all three variants in so many species for a very long amount of time. Scientists don't yet have a simple answer to why evolution has done this, but they aren't complaining.



PUTTING THE GENE EDITING TOOL TO USE

When you edit a letter or a document, you make specific changes in the words and phrases to make the meaning clearer. Gene editing involves changing the sequence of DNA using specific enzymes which can cut DNA at a precise location, thus permitting the removal, addition, or replacement of genetic information within a gene. The process is akin to correcting a misspelled word in a sentence or replacing it with a more appropriate word. In organisms, this modification directly alters the genetic instructions encoded in the DNA.

In earlier days, if we wanted to modify the message in the DNA to a desired function, it involved two enzymes — one to cut the DNA at a specific site, and another to help insert the desired genetic change. While such twin-enzyme methods worked, they were laborious.

This was when Drs Jennifer Doudna of University of California, Berkeley, U.S., and Emmanuelle Charpentier of Humboldt University, Germany came out with a double action gene modification method, called CRISPR-Cas9. This is a mechanism that can edit the genomes of humans, pathogens, and plants. CRISPR stands for Clustered Regularly Interspaced Short Palindromic Repeats, and Cas9 (which stands for CRISPR- associated Protein 9) cuts DNA strands at a specific location, creating a gap that can be filled with new DNA. Doudna and Charpentier shared the Nobel Prize in 2012.

However, Prof. Feng Zhang who was then at a Southern California University, published a paper wherein he showed genome engineering using the CRISPR-Cas9 system. But he was not included as the third scientist by the Nobel Committee. He then went ahead, obtained a patent, and moved to Boston, where he works and this patent is owned today by the MIT-Harvard University combine, called Broad Institute, which uses the CRISPR-Cas9 system for a variety of applications such as the mouse model for cancer, identifying genes that make cancer drugs ineffective, and modification of immune cells, plus training people in the technology.

While CRISPR-Cas9 patented technology has been used for the above-mentioned diagnostic and genetic uses, agricultural scientists and botanical researchers have been using this method to genome engineer plants. The group of Dr. Holger Puchta of the Karlsruhe Botanical Institute, Germany has published several papers, notably on how to use Cas9, Cas 12, and Cas13, for targeting plant s. Most recently, CRISPR-Cas9 based 'knock-out' of two genes in tomato plants increased their sweetness with no loss in weight. Similar studies on other plants and fruits will surely follow.

However, a recent report by Dr. Anurag Chaurasia, titled "How CRISPR patent issues block Indian farmers from accessing biotech benefits", points out that the IPO has granted a local patent to ERS Genomics of Dublin, which allows Indian researchers to use CRISPR-Cas9 only for academic purposes. Our rural farmers are thus still left 'classical'.

MILLIONS OF DIABETES, HEART DISEASE CASES LINKED TO SUGARY DRINKS

A new study estimates that in 2020, 2.2 million new cases of type 2 diabetes and 1.2 million new cases of cardiovascular disease occur each year globally due to consumption of sugar-sweetened beverages, representing 9.8% and 3.1%, respectively, of all incident cases. The study estimated sugar-sweetened beverage-attributable type 2 diabetes and cardiovascular disease burdens across 184 countries in 1990 and 2020.



Sugary beverages are rapidly digested, causing a spike in blood sugar levels with little nutritional value. Regular consumption over time leads to weight gain, insulin resistance, and a host of metabolic issues tied to type 2 diabetes and heart disease, two of the world's leading causes of death. Men are more likely than women to suffer the consequences of sugary drink consumption, as are younger adults compared to their older counterparts, the researchers say.

They call for a multi-pronged approach, including public health campaigns, regulation of sugary drink advertising, and taxes on sugar-sweetened beverages. Some countries have taken steps in this direction. Mexico, which has one of the highest per capita rates of sugary drink consumption in the world, introduced a tax on the beverages in 2014. Early evidence suggests that the tax has been effective, particularly among lower-income individuals.

COSTLY HPV VACCINE NEEDS TO BE PART OF NATIONAL IMMUNISATION PROGRAMME

January is Cervical Cancer Awareness Month, and doctors are urging women to get screened for this deadly disease. Cervical cancer develops in the cervix, or the wall of the cervix. The Human Papillomavirus (HPV) is responsible for 99.7% of cervical cancers worldwide and is among the leading causes of cancer in Indian women. The HPV vaccine is the most effective way to prevent it, as it stimulates the immune system to produce antibodies that neutralise the virus.

In India, HPV vaccines are only available under prescription by private practitioners, even though the National Technical Advisory Group for Immunisation (NTAGI) has recommended that the HPV vaccine be included in the national immunisation programme. A senior Health Ministry official noted that the Ministry was working on the inclusion. The NTAGI recommends a one-time catch-up for girls aged 9–14, followed by routine introduction at 9 years.

A vaccine that helps

The HPV vaccine was introduced in India in 2008, but its high cost has limited its use. Some states, such as Punjab and Sikkim, have introduced the vaccine into their immunisation programmes. The vaccine is most effective when given before exposure to the virus and is recommended for children aged 12 to 13 years old and people at high risk from HPV. The vaccine is safe and well tolerated and can be used in people who are immunocompromised or HIV-infected. Common side effects include mild fever, tenderness, swelling, and redness at the injection site. It doesn't treat existing HPV infections or diseases. However, it can prevent more than 90% of cancers associated with HPV.

It protects against genital warts and most cases of cervical cancer. It protects against cancer of the vagina, vulva, penis, or anus caused by HPV. The HPV vaccine also protects against mouth, throat, head, and neck cancers caused by the virus. India has authorised several HPV vaccines, including Gardasil (a quadrivalent vaccine that protects against HPV-6, 11, 16, and 18), Cervarix (a bivalent vaccine), and Cervavac (an Indian-developed vaccine that targets high-risk HPV types).

In India, cancer of the cervix uteri is the 3rd most common cancer, with an incidence rate of 18.3% (123,907 cases), and the second leading cause of death, with a mortality rate of 9.1%, as per GLOBOCAN 2020. The age-standardised incidence rate per 1,00,000 population was 18, while the five-year prevalence rate across all ages was 42.82 per 1 lakh population. As per the National Cancer Registry Programme, cancer of the breast and cervix uteri was the most common cancer among females. Cervical cancer accounted for 6-29% of all cancers among women in India.



Papumpare district in the state of Arunachal Pradesh, India, had the highest incidence rate of cervical cancer (27.7) in Asia.

The majority of the patients with cancer were diagnosed at the locally advanced stage for breast (57%), cervix uteri (60%), head and neck (66.6%), and stomach (50.8%) cancer, whereas in lung cancer, distant metastasis was predominant among males (44%) and females (47.6%).

Challenges ahead

Experts note that among the top challenges to the uptake of HPV vaccination in India are the high cost of the vaccine, concerns about its safety and effectiveness due to lack of awareness and cultural perceptions around reproductive health.

Richu Sharma, consultant medical oncologist, Ujala Cygnus Group of Hospitals, speaking about the cost and coverage of the vaccine, notes that Gardasil 9 is priced at ₹10,850 per dose, Gardasil 4 costs range between ₹2,000 and ₹4,000 per dose, while Cervavac (the first Indian-made HPV vaccine by the Serum Institute of India, effective against HPV types 16 and 18, approved for ages 9 to 26) is priced at ₹2,000 per dose. Vaccines like Gardasil and Cervavac are already approved for use in boys and young men, offering protection against HPV-related conditions such as genital warts and certain cancers, including anal and throat cancers. This marks an essential step towards broader HPV prevention in all genders.

Sowmya Sampurna M., obstetrics and gynaecology, Apollo Cradle and Children Hospital, Hyderabad, said that all males and females aged 9-26 years should get the HPV vaccine. Unvaccinated men and women aged 27-45 years should consider getting vaccinated. The HPV vaccine is most effective if it's given before exposure.

HOW TO DIAGNOSE OBESITY: LANCET COMMISSION RECOMMENDS FOCUSING ON FAT DISTRIBUTION, NOT JUST BMI. HERE'S WHY IT IS SIGNIFICANT

The Lancet Diabetes & Endocrinology Commission, a group of 58 leading experts from various medical specialties and countries, on Tuesday proposed a new approach to defining and diagnosing obesity. This approach goes beyond just using Body Mass Index (BMI)—a numerical estimate of a person's weight relative to their height, traditionally used to determine obesity.

The commission acknowledges that BMI is a helpful screening tool for identifying people who might have obesity but experts suggest it shouldn't be the sole method. Instead, they recommend confirming obesity by assessing excess body fat and how it's distributed in the body. This includes combining BMI with at least one body size measurement, such as waist circumference, waist-to-hip ratio, or waist-to-height ratio, or using at least two body size measurements regardless of BMI.

The commission also suggests direct body fat assessments, like DEXA scans, for a more accurate measurement, especially when BMI is not used. For people with an extremely high BMI (for instance above 40 kg/m²), it can be assumed they have excess body fat without additional testing, the commission has recommended.

Why has the commission recommended a newer approach

A BMI of over 30 Kg/m² is considered as an indicator of obesity for people of European descent. However, different, country-specific BMI cutoffs are also used to account for ethnic variability of



obesity-related risk. “Relying on BMI alone to diagnose obesity is problematic,” Commissioner Professor Robert Eckel, University of Colorado Anschutz Medical Campus (USA) said.

“Some individuals tend to store excess fat at the waist or in and around their organs, such as the liver, the heart or the muscles, and this is associated with a higher health risk compared to when excess fat is stored just beneath the skin in the arms, legs or in other body areas. But people with excess body fat do not always have a BMI that indicates they are living with obesity, meaning their health problems can go unnoticed. Additionally, some people have a high BMI and high body fat but maintain normal organ and body functions, with no signs or symptoms of ongoing illness,” Eckel explains.

Two new categories of obesity: ‘clinical obesity’ and ‘pre-clinical obesity’

The Commission has also introduced two new diagnostic categories of obesity — clinical and preclinical obesity — to enable clinicians to differentiate between health and illness at the individual level.

The commission defines clinical obesity as a chronic, systemic illness characterized by alterations in the function of tissues, organs or the individual, due to excessive and or abnormal fat in the body. It outlines 18 diagnostic criteria for clinical obesity in adults, focussing on the central nervous system, respiratory system, cardiovascular health, metabolism, liver, kidneys, and reproductive health. Additionally, it specifies 13 diagnostic criteria applicable to both children and adolescents.

The commission defines pre-clinical obesity as a condition where there is excess body fat but the tissues and organs are still functioning normally. However, it increases the risk of developing clinical obesity and other serious health problems, such as type 2 diabetes, heart disease, certain cancers, and mental health issues.

According to Dr Misra, for preclinical obesity, lifestyle modifications such as diet and exercise can often suffice. “For clinical obesity, additional therapies, including medications and, in some cases, weight-loss surgery, may be necessary. This approach allows for tailored interventions, improving outcomes while addressing India’s unique health challenges related to abdominal obesity and its complications,” Misra said.

Why prioritising abdominal obesity is crucial for India

Indians have a high prevalence of abdominal obesity and related diseases, such as diabetes, even at slightly elevated body weight and waist circumference, Dr Misra emphasizes. “Given this context, focussing on abdominal obesity as a priority is both rational and relevant for controlling associated diseases. Equally important is fat accumulation in the liver, known as fatty liver, which is broadly a part of abdominal fat accumulation. This condition is another critical component of the metabolic cluster seen in Indians and is linked to diabetes and heart disease.”

According to the National Family Health Survey (NFHS-5, 2019–21), 6.4% of women and 4.0% of men aged 15–49 years are obese. Recent research highlights that Asian Indians experience more severe metabolic consequences from excess fat accumulation. “Studies show that excess fat in Indian populations generates higher levels of inflammation and metabolic disturbance at lower BMI thresholds compared to Western populations. Additionally, childhood obesity rates are rising across the country, leading to concurrent increases in conditions such as diabetes, lipid disorders, fatty liver disease, and cardiovascular disease,” Dr Misra explains.