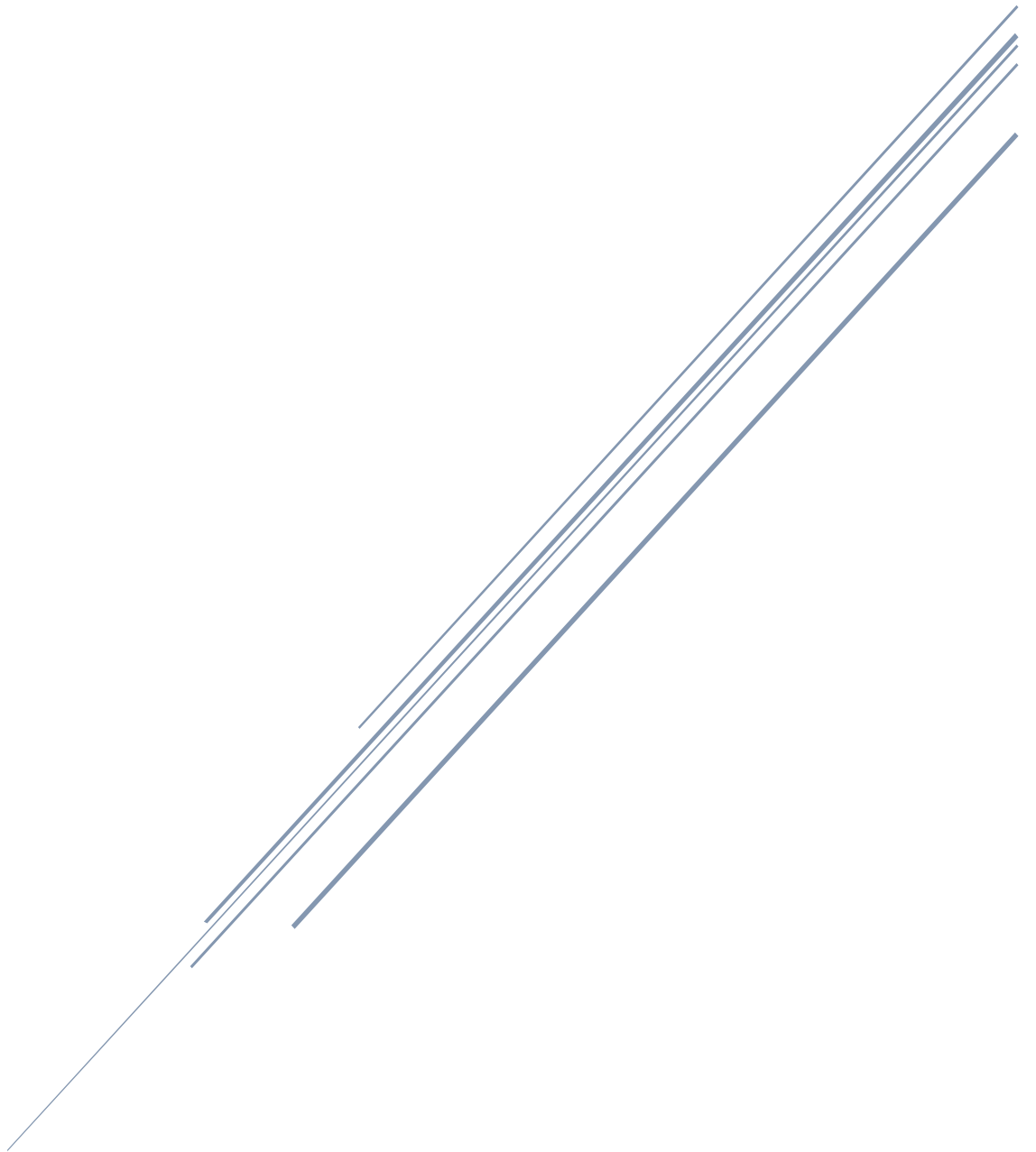


CURRENT AFFAIRS FOR UPSC

8th to 14th March 2026





INTERNATIONAL

WHY DOES THE STRAIT OF HORMUZ'S CLOSURE MATTER?

The story so far:

The Strait of Hormuz, one of the world's most strategically important chokepoints, has been experiencing a near-total collapse in commercial traffic following rising tensions in West Asia. More than 20% of the world's total oil and gas shipments, and nearly 40% of India's, pass through the strait.

What is the significance of the strait?

The Strait of Hormuz, only 33 kilometres wide at its narrowest, lies between Iran, Oman, and the UAE. It is a vital route for oil and gas from Saudi Arabia, Qatar, Kuwait, Iraq, and Iran leaving the Persian Gulf to various destinations.

Other important shipping chokepoints in the world include the natural Malacca Strait off Singapore through which almost the entire west-bound Chinese maritime trade takes place; the Bab-al-Mandab at the mouth of the Red Sea, which has come under Houthi influence; the artificial Suez Canal connecting Europe and Africa-Asia; the artificial Panama Canal linking the Pacific and Atlantic Oceans; and the straits of Bosphorus and Dardanelles connecting the Mediterranean and Black Sea via the Sea of Marmara, which are crucial not just for nations such as Romania but also for Russia.

While Egypt and Panama hold sovereignty over the Suez and Panama canals, respectively, Turkey has exclusive sovereign rights over the Bosphorus and Dardanelles straits. Nations such as Malaysia and Singapore, and Iran and Oman play a major role in securing the natural straits (Malacca and Hormuz) while not holding sovereignty over them. India has been building naval presence in the Andaman and Nicobar Islands with the strategic aim of gaining leverage over Chinese trade across the Malacca Strait.

What is the current situation?

Since February 28, when the U.S. and Israel attacked Iran, and Iran retaliated, ship traffic across the strait has reduced by some 95%. Nine ships have faced attacks in or near the strait. Shipping is a high-risk business and even small damages can prove costly to repair. Lloyds List Intelligence, a maritime information provider, estimates that some 600 ships are now stranded in the region. Some 250 are bulk carriers carrying loose cargo such as coal, ores, and grain. Others include some 200 oil tankers and 50 gas carriers.

Can countries just halt shipping lanes?

International law generally treats the seas as commons. Though territorial waters and exclusive economic zones are recognised, in general, laws and practices tend to be favourable towards free usage of all of the seas by merchant ships, and by naval ships for "innocent" passage.

In the past, Egypt has shut down the Suez Canal. Panama has not shut down its canal. No country can order the shutdown of the Straits of Hormuz and Malacca as its sovereign right. However, lack of security, emanating from threats and attacks, can make shippers wary of making the passage due to fears of loss of life and property.



As a result, insurance costs can balloon. In the current situation, insurance premiums have climbed 10-15 times on a case-by-case basis depending, among other factors, on whether a ship is affiliated with any of the belligerent parties. A rough estimate suggests that purchasing insurance for just one week of a ship transiting the strait would cost nearly as much as what the owner would normally pay for a year.

Are there alternatives to this strait?

Saudi Arabia can transport fuels to its western ports on the Red Sea, such as Yanbu, through pipelines. However, ship traffic in the Red Sea plummeted when Houthi attacks started in 2023-24. In October 2023, for instance, there were around 2,300 ship transits across Bab-el-Mandab, the strait at the mouth of the Red Sea. By January, the number had dwindled to less than half of that. Since then, ship transits have only marginally gone up. Any attempt to leverage Red Sea ports may invite attacks from the Houthis, who are aligned to Iran.

How does closing the strait help Iran?

Iran has spoken in multiple voices over allowing ship passage. Currently, about one in five ships passing through the strait are Iranian. While those speaking for the Iranian government have said they would not like ship traffic to halt, agencies such as the Iranian Revolutionary Guards have threatened attacks. Iran hopes that closing the strait will force world opinion to bear upon Israel and the U.S. to end the conflict.

The strait is a leverage that Iran has historically exercised, such as during the Iran-Iraq war in the 1980s. At the time, the U.S. allowed merchant ships registered in other nations to fly its flag. This provided legal sanction for the U.S. to deploy its Navy to escort merchant ship convoys across the strait.

India's response was unique then. Leveraging its neutrality and positive relationships in the region, the Shipping Corporation of India (SCI) had its ships painted 'INDIA' in big, bold white letters against the black hull so that the ships would be visible and stand out as belonging to India. Although there were attacks on SCI ships, the move did succeed to a large extent.

This time too, the U.S. President has vowed to keep ship traffic flowing through the strait. He has talked about escorting ships to provide direct security and also help defray insurance costs. India has been in touch with U.S. authorities for securing maritime insurance cover from the International Development Finance Corporation. The proposal had come from the U.S. government, officials have said.

How does the situation affect India's economy and oil prices?

Some 40% of India's oil flows through the strait. Qatar supplies half of India's liquefied natural gas (LNG) imports, which in turn provide half of the country's natural gas needs. Qatar shut down its LNG production when the conflict began.

While LNG is regasified to supply city gas uses such as for cooking, power plants and other industrial uses, about 30% of India's natural gas is directed towards fertilizer production. Though this is the off season for fertilizers, the situation may not recover fast enough when ammonia fertilizer demand picks up later this year. The government is actively pursuing other LNG sources, such as the U.S., Russia, and Australia.



Some 60% of India's Liquefied Petroleum Gas (LPG), which is mostly a mixture of propane and butane, comes from imports largely upstream of the strait. A shortage of LPG, the dominant cooking gas in India, is far more worrying. The government has come up with a series of measures, such as tweaking the oil refining process to produce more of propane-butane and prioritising cooking gas use of propane-butane.

The U.S. has given the green light for India's purchase of Russian crude for 30 days, which is a relief. India has built supply networks with Russia and these will come in handy. Overall, Brent crude price has been hovering below \$90 (it shot past \$125 when Russia attacked Ukraine). In a reflection of the turn towards Russian oil, high sulphur Urals oil (from Russia) is now costlier than Brent oil in India. Increase in global crude prices may force the Indian government to increase administered price hikes in petrol and other fuels for transport and other uses, leading to a spiralling effect on the economy.

HOW AIRSTRIKES TRIGGERED BLACK RAIN IN TEHRAN

When Tehran residents stepped outside on Sunday morning, something was very wrong with the rain. It wasn't the usual grey drizzle. It was black — oily, soot-laden droplets coating cars, clothes, and skin, falling dozens of miles from the source of the disaster. This was "black rain" in Iran and it has become one of the war's most alarming consequences.

Key Takeaways:

— On the night of March 7-8, Israeli strikes hit four oil storage facilities and an oil production transfer centre in Tehran and the province of Alborz, igniting large fires that burned for hours.

The targeted sites included the Aghdasieh oil warehouse in northeast Tehran, the Shahrn oil depot, and the Tehran refinery in the south.

— The Iranian Red Crescent was quoted by The Times of Israel as saying that the explosions released significant quantities of toxic hydrocarbon compounds, sulfur, and nitrogen oxides into the air. As rain moved through the pollutant-saturated skies over the city, it absorbed these chemicals — and fell back down as oily, blackened precipitation.

— Scientists explained that the black rain resulted from a weather pattern bringing rain into the area, which combined with particles already suspended in the atmosphere.

— On Tuesday, the World Health Organization (WHO) warned that black rain and acidic rain falling over Tehran pose a real danger to the population, primarily to respiratory health, and backed Iran's advisory urging people to remain indoors.

— The strikes, WHO spokesperson Christian Lindmeier stated, caused a massive release of toxic hydrocarbons, sulfur oxides, and nitrogen compounds into the air. Scientists said inhaling or touching the smoke or particles could cause headaches, skin and eye irritation, and difficulty breathing — and that longer-term exposure to some compounds increases cancer risk. Lindmeier stated that the "black rain" and "acidic rain" in Tehran "is indeed a danger" for Iranians.

— The Iranian Red Crescent warned that the rain could cause serious lung damage and chemical burns to the skin, reported CBC News. Tehran was already vulnerable before the first strike landed. Doug Weir, director of the UK-based Conflict and Environment Observatory, told CBC



News that the city is surrounded by mountains, meaning pollutants are pushed downward and inward. Combined with its dense urban layout, air doesn't circulate as it ideally should.

— The 'black rain' crisis may outlast the fires. Scientists warned that "forever chemicals" — likely present in flame retardants built into the facilities — could contaminate groundwater and become airborne, ending up back in the rain. Acid rain, depending on concentration, could also accelerate corrosion of buildings already weakened by Tehran's chronic air quality problems.

— The Conflict and Environment Observatory in its latest report has tracked over 232 incidents with environmental risk since the conflict began, and warned of contamination of vegetation that could expose humans and animals to toxic compounds through the food chain.

HIT TO KILL

The Terminal High Altitude Area Defence (THAAD) system is one of the most advanced missile defence platforms developed by the United States to counter ballistic missile threats.

Designed to intercept missiles during the final stage of their flight, THAAD can destroy incoming threats both inside and outside earth's atmosphere, providing a critical defensive layer against short-medium- and limited intermediate-range ballistic missiles. The U.S. deployed additional THAAD batteries to the West Asian region before it launched the invasion of Iran on February 28, along with other weapons.

Unlike many traditional air defence systems that rely on explosive warheads, THAAD uses "hit-to-kill" technology. This means its interceptor missiles destroy incoming targets by directly colliding with them at extremely high speeds, relying on kinetic energy rather than an explosive blast.

This approach significantly improves precision and reduces the risk of debris from explosive interceptors affecting populated areas. THAAD can engage ballistic missile targets at ranges of roughly 150–200 kilometres, intercepting them at high altitude before they descend toward their intended targets.

Key components

The THAAD weapon system is a major element of the broader Ballistic Missile Defence System (BMDS) architecture and consists of several integrated components: interceptors that destroy incoming missiles through kinetic impact; truck-mounted launchers used to deploy the interceptors; and the powerful AN/TPY-2 radar, which detects and tracks missile threats at a long range; a tactical fire control and communications unit that coordinates targeting and engagement; and additional logistics and support equipment.

A typical THAAD battery includes around 90 personnel, six launchers, and 48 interceptors, with each launcher carrying eight missiles.

THAAD is designed to operate as part of a layered missile defence network. It can integrate with other systems such as the MIM-104 Patriot, including the Patriot Advanced Capability-3 (PAC-3), as well as the Aegis Ballistic Missile Defence system used by naval forces.

In recent tests, THAAD has demonstrated its ability to launch PAC-3 missile segment enhancement (MSE) interceptors, highlighting growing interoperability within the U.S. missile defence architecture.



The THAAD system is highly mobile and rapidly deployable, allowing the U.S. Army to position it in regions facing missile threats. The first operational THAAD battery was deployed to Guam in 2013. Internationally, the UAE became the first foreign buyer in 2011, followed later by Saudi Arabia.

The system has been in the spotlight ever since the latest war on Iran began on February 28. Iran has reportedly destroyed a key radar associated with the THAAD system used by the U.S. to detect and intercept ballistic missiles in West Asia, dealing a major blow to Washington's regional missile defence network as the war on Iran enters its second week, according to media reports.

Satellite imagery cited in the reports suggests that an AN/TPY-2 radar, valued at around \$300 million and manufactured by RTX Corp., along with its support equipment, was destroyed at Muwaffaq Salti Air Base in Jordan during the early days of the conflict. The radar plays a critical role in guiding U.S. missile defence batteries deployed across the Persian Gulf.

But despite such setbacks, THAAD remains a critical piece in America's defensive shield. Ballistic missiles travel at extremely high speed and high altitudes, leaving little time for defence once they approach their targets. Systems like THAAD are designed to intercept these threats far from population centres and critical infrastructure, increasing the chances of neutralising them before impact.

As missile technology continues to evolve, THAAD remains a key element of the U.S. strategy to build a multi-layered missile defence shield capable of countering a wide range of ballistic missile threats.

INDIA CO-SPONSORS RESOLUTION PASSED BY UNSC AGAINST IRAN

On Wednesday, India co-sponsored a Gulf Cooperation Council (GCC) resolution at the United Nations Security Council (UNSC) along with 134 countries that demanded the "immediate cessation of all attacks by the Islamic Republic of Iran" against GCC countries Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, the United Arab Emirates, and Jordan. The resolution was passed with 13 UNSC members voting in favour while Russia and China abstained.

It condemned "any actions or threats by the Islamic Republic of Iran aimed at closing, obstructing, or otherwise interfering with international navigation through the Strait of Hormuz".

"The resolution reflects several of our positions," said Ministry of External Affairs spokesperson Randhir Jaiswal at a weekly press briefing on Thursday.

"We have a large diaspora in the GCC countries, and their well-being and welfare are of utmost importance. The Gulf is also very important for our energy security needs," Mr. Jaiswal added, in references to about 10 million Indians who live and work in West Asia, and India's energy purchases from the region that make up about 50% of its crude oil and 90% of its liquefied petroleum gas (LPG) imports.

In contrast, there are about 9,000 Indians in Iran and India has discontinued its energy imports from Iran since 2019, under threat of U.S. sanctions. The Indian support for the UNSC resolution comes on the heels of a number of statements by the Ministry condemning specific Iranian actions such as the attacks on various countries across the West Asian region, buildings in Dubai, Omani facilities and a Thai ship bound for India.



U.S.-Israeli actions

However, India has not similarly condemned the attacks by the U.S. and Israel on Iran, in which an estimated 1,255 people have been killed, including Iran's Supreme Leader Ayatollah Ali Khamenei, his family and advisors; the sinking of Iranian ship IRIS Dena in the Indian Ocean that had been hosted for exercises by India; or the bombing of a school in Mubin in which 150 schoolgirls are believed to have been killed. Nor has India or the GCC-led resolution spoken about Israel's strikes on Lebanon, where the government said more than 630 people have been killed, and 8,00,000 displaced from their homes.

To a question from The Hindu about the seemingly unbalanced responses, Mr. Jaiswal said that the MEA had issued statements, and External Affairs Minister S. Jaishankar had made suo motu statements in both Houses of Parliament that regretted the loss of lives.

"As far as the question of the schoolchildren is concerned... we have issued several statements on the ongoing conflict. We have underlined the need for prioritising the safety of all civilians. We regret the precious lives lost, and express our grief in that regard," Mr. Jaiswal said.

In the past few days, India's "silence" on U.S. and Israeli actions has come in for criticism from a number of senior former diplomats speaking to the media and at various public events.

"Diplomacy should recognise complexity, not reduce it to a single culprit," former Indian Foreign Secretary and former Ambassador to the U.S. Nirupama Menon Rao said on Thursday in a post referring to the Ministry of External Affairs statement, suggesting that India's sponsorship of the UN resolution would "endorse a narrative that begins the story with Iranian retaliation rather than the escalation that preceded it".

In an interview to news agency ANI, former Foreign Secretary Kanwal Sibal said India should have issued a statement condoling the death of Ayatollah Khamenei "to recognise that the head of state contrary to norms of international law has been politically assassinated".

Speaking about the March 4 submarine torpedo attack that sank the IRIS Dena "very close to India shores", former Foreign Secretary Shyam Saran said that India must assert itself in the face of U.S. actions. "Tactical subservience can easily result in strategic irrelevance," he added.

THE IRAN WAR EXPOSES INDIAN MIGRANT WORKERS IN GULF TO AN UNCERTAIN FUTURE

With the Iran war casting a long shadow over the Gulf over the past two weeks, what once appeared to be a region of glittering airports, financial hubs and endless construction now looks extremely vulnerable. India has already acknowledged the seriousness of the crisis. The External Affairs Ministry had said that within less than a week of the war in the Gulf region beginning, more than 52,000 Indians had already returned from the Gulf under special arrangements, and the number may rise in the coming days. India has also issued repeated advisories on West Asia, showing that this is a real regional emergency.

For the Gulf Cooperation Council (GCC) states, the danger is not only military but structural. These states built their prosperity on stability, open sea lanes, energy exports, global finance and migrant labour. A prolonged war threatens every one of these pillars. Iran's strategic logic is also clear enough. Tehran sees several GCC monarchies not as neutral neighbours but as part of a wider U.S.-led security architecture in the region. That perception is influenced by the long presence of Western military bases and by the political afterlife of the Abraham Accords, which began formal



normalisation between Israel and the UAE and Bahrain in 2020. In Iran's view, the Gulf cannot claim neutrality while remaining tied to American security power and, in some cases, to new arrangements with Israel.

Severe implications

The socio-economic implications are severe. Even where missiles do not land directly, fear itself can become an economic weapon. Insurance costs rise. Shipping routes become uncertain. Investors retreat. Aviation schedules are disrupted. Tourism slows. Energy markets become volatile. The Strait of Hormuz remains the region's most sensitive choke point, and any threat there immediately affects oil and gas flows.

The GCC states have tried to diversify, especially the UAE and Saudi Arabia, but diversification does not remove vulnerability. It only changes its form. Dubai depends on confidence, connectivity and circulation. Saudi Arabia's large-scale transformation plans require enormous capital and long-term predictability. Qatar's strength in liquefied natural gas depends on uninterrupted maritime movement. Oman's ports depend on trade stability. In short, the Gulf's prosperity rests not only on oil but also on the belief that it is safer than the rest of West Asia. War damages that belief.

The deepest wound, however, falls on migrant workers. The GCC hosts over 25 million Asian migrants, making it one of the largest labour migration corridors in the world. Indians form one of the GCC's biggest communities. Official Indian data puts the Indian-origin population in the UAE at over 3.4 million and in Saudi Arabia at nearly 2.6 million; Qatar also hosts a fairly large Indian community. For Kerala, this is not an abstract number. Kerala Migration Survey 2023 found that remittances amounted to 23.2% of the State's Net State Domestic Product, showing how deeply the State's economy is tied to migration income. The same report underlined that remittances were 1.7 times the State's revenue receipts. That means any Gulf shock quickly becomes a Kerala social crisis.

Migrant workers are hit

In such a situation, migrant workers are always the most exposed. Executives may leave first. Capital may move digitally. Diplomats may negotiate exits. But low-paid workers in construction, transport, retail, domestic work and services remain trapped between fear and necessity. They cannot easily abandon jobs. They often live in shared accommodation far from urban protection zones. They must keep sending money home even when uncertainty grows. For many families in Kerala, remittances are not extra income. They pay for food, education, health care, housing loans and daily survival. A prolonged war, therefore, means more than temporary anxiety. It may lead to job losses, wage delays, stalled projects, reverse migration and a renewed social burden on Kerala's already strained economy.

The larger lesson is thoughtful. The Gulf's modern order was built on external security guarantees, hydrocarbon wealth and imported labour. The Iran war shows how brittle that order really is. If the conflict continues, the GCC may harden its security systems, restrict labour mobility and prioritise national workforces. That would narrow the space for skilled or low-skilled migrants from India. Even if the war subsides soon, the psychological break will remain. The Gulf will continue to matter for India, but the old certainty of the "Gulf dream" has been shaken. For millions of Indian families, the bridge across the Arabian Sea still stands, but it now stands under fire. Jean-Paul Sartre once wrote, "When the rich wage war, it is the poor who die," and in the modern Persian Gulf, it is the migrant who loses their lifeline.



GENERATIONAL SHIFT

In a country that has seen political instability following every election since multiparty democracy was restored in 1990, Nepali voters have finally delivered a decisive mandate and in favour of a relatively new party. In the March 5 elections, Rastriya Swatantra Party (RSP), founded barely four years ago, won a commanding majority in the 165 directly elected seats to the House of Representatives and roughly 50% of proportional votes, decimating parties that dominated Nepali politics for decades. The RSP is not the first to secure a decisive majority under the new Constitution of 2015. In the 2017 elections, the first elections held under the federal framework, the Left Alliance of the Communist Party of Nepal (Unified Marxist-Leninist) led by K.P. Sharma Oli and the Communist Party of Nepal (Maoist Centre), helmed by Pushpa Kamal Dahal won close to a two-thirds majority. The two parties merged to form the Nepal Communist Party, but the union was voided in 2021. What followed was the familiar rigmarole of shifting alliances and a carousel of Prime Ministers — Mr. Oli, Mr. Dahal, and the Nepali Congress's Sher Bahadur Deuba — with none able to anchor a stable government.

It was this “dance of the status quoists” that provoked the 2025 youth-led Gen Z uprising against entrenched corruption and patronage politics, eventually leading to Mr. Oli's resignation and a Sushila Karki-led caretaker government. Ms. Karki creditably oversaw a largely peaceful election within a compressed timeframe. The results show that the Gen Z protests were no flash in the pan. Balendra Shah's entry transformed the RSP's fortunes. A former rapper who stormed into politics by winning the 2022 Kathmandu mayoral election as an independent, Mr. Shah joined the RSP in January and became its prime ministerial candidate. The 35-year-old politician defeated 74-year-old Mr. Oli by nearly 50,000 votes in his stronghold Jhapa. Mr. Shah was the choice of the Gen Z protesters when they demanded a generational shift in political leadership and a decisive break from the Oli-Dahal-Deuba troika. The scale of the RSP's victory, including a clean sweep of all 15 seats in the Kathmandu Valley, is a powerful expression of a young electorate's frustrations. This is a verdict against incestuous patronage politics, endemic corruption, and the dire economic conditions that have driven Nepalis to work abroad. Whether the RSP, and Mr. Shah, can translate this sweeping mandate into the institutional reform and economic revival that Nepal desperately needs remains to be seen. Considering that Mr. Shah's tenure as mayor drew criticism for an anti-poor and technocratic approach to urban governance, the mandate must be greeted with caution.

DreamIAS

**NATIONAL****WHY ALGORITHMIC SOVEREIGNTY SHOULD BE INDIA'S TOP PRIORITY**

A day after a U.S. submarine sank the Iranian frigate IRIS Dena inside Sri Lanka's Exclusive Economic Zone (EEZ), I posed a straightforward question to an advanced Artificial Intelligence (AI) system: "Was the sinking legal under international law?" The reply was instant: "It was not illegal." No qualification, no reference to the deeply contested nature of military activities in an EEZ, and no mention that India and most Global South nations interpret the UN Convention on the Law of the Sea (UNCLOS) very differently from the U.S. and its allies.

When the response was challenged — pointing out India's longstanding position that Article 58 of the UNCLOS requires coastal-state consent for foreign military activities in an EEZ, and that similar views are held by China, Indonesia, Brazil, South Africa, Iran, and many others — the AI conceded. It acknowledged that its initial answer had drawn heavily from Western naval doctrine and Western legal scholarship. The machine, in other words, spoke with the accent of its Western training data. This is not a minor technical glitch. It is a foundational bias with serious geopolitical implications.

Not a neutral arbiter

Article 58 of the UNCLOS grants foreign states freedom of navigation, overflight, and "other internationally lawful uses of the sea related to these freedoms" in an EEZ. Two sharply divergent interpretations of this Article have emerged. The U.S.-led Western view treats these freedoms expansively, encompassing intelligence collection, submarine operations, military exercises, weapons testing, and even combat actions — provided they occur beyond territorial seas. India and much of the Global South read the provision more restrictively: the listed freedoms must be genuinely related to navigation and overflight, while the obligation under Article 58(3) to show "due regard" for the coastal state's rights carries real weight. From this perspective, most military activities in an EEZ require prior consent.

Since the treaty text is silent on many specifics, the prevailing interpretation will therefore depend less on legal exegesis than on power, persuasion, and the dominant discursive frameworks — which are increasingly shaped by AI systems.

A parallel humanitarian issue was also absent from the AI's initial reply to my query: the duty to rescue under Article 18 of the Second Geneva Convention. The provision requires parties to take "all possible measures" to search for and collect shipwrecked persons "without delay." Reports indicate that the attacking submarine departed the scene quickly, leaving rescue operations to the Sri Lankan Navy, which received a distress call from the stricken warship. At least 87 sailors died; 32 were saved. The only recognised exception to this duty is operational infeasibility, but no public evidence has established that rescue was infeasible here. The AI system did not even consider this aspect until it was confronted. Politely, it acknowledged its mistake.

This exchange with the model exposes a deeper reality: contemporary AI is not a neutral arbiter of international law. It mirrors the data on which it was trained, which is disproportionately Western in authorship, perspective, and institutional origin. The bias is arguably not intentional, it is structural. Yet, Western readings become the "default" answer, while Global South positions are relegated to "alternative" status or made invisible. Thus, power asymmetries are quietly encoded into machine outputs. When an AI declares — with no apparent doubt — that the sinking



of IRIS Dena was “not illegal,” it is reproducing a worldview that privileges the strategic preferences of a small group of powerful states over the legal stances adopted by a majority of countries.

The IRIS Dena incident is a reminder that the Indian Ocean is no longer insulated from extra-regional conflict and that U.S. preoccupations in the neighbourhood are out of sync with India’s priorities. But it is also a reminder that the architecture of interpretation — the systems that tell us what counts as law, humanitarian failure, or acceptable conduct— will increasingly be algorithmic. This matters because policymakers and analysts today routinely turn to AI tools. When those tools systematically favour one interpretive tradition, that interpretation gains outsized influence. The consequence goes beyond academics; it is geopolitical.

A wake-up call for India

The global AI landscape is moving toward bipolarity, dominated by U.S. and Chinese architectures reflecting their respective data models and assumptions. There are well-grounded reservations about opting for the ‘China AI stack’. The debate now centres on whether to adopt the ‘U.S. AI stack’, or to pursue a ‘sovereign Indian stack’.

The pitch for the U.S. stack is seductive — chips, clouds, models, and platforms that it offers to ‘trusted partners’ as the fastest route to AI capability. But beneath the language of partnership lies a familiar asymmetry. If the core infrastructure, computing power, and frontier models remain controlled elsewhere, sovereignty becomes a matter of permission. Besides, there is also the expectation that India’s AI ecosystem will be ‘China-free’, though the U.S. is willing to co-mingle with China in AI locations in the Gulf.

Pragmatists, who consider catching up with global AI systems as the first priority, argue that India cannot realistically out-train Silicon Valley on frontier models. The real economic payoff, they say, lies in closing the deployment gap: embedding world-class foreign engines into India’s unique workflows in healthcare, agriculture, education, and governance. The emphasis would be on building the applications, and not expending resources on engines.

AI advocates who prioritise sovereignty, however, counter that exclusive reliance on foreign foundational models carry unacceptable strategic risks. U.S. models are trained predominantly on Western data and carry linguistic, cultural, and strategic biases ill-suited to India’s diverse realities. More fundamentally, dependence on externally controlled compute, models, and data pipelines risks digital colonialism: foreign algorithms would govern data flows, set innovation boundaries, and mediate knowledge production.

The path forward

India cannot afford to remain a passive consumer of intelligence or a vendor of applications produced by AI architecture elsewhere. It must become a producer of models, datasets, and interpretive frameworks. Our scale, linguistic diversity, democratic complexity, and geopolitical position demand more than adaptation or applications; they demand ownership of the algorithmic layer that will shape future cognition. This means strategic choice, not autarky: the ability to integrate with global ecosystems without structural dependence. It requires sustained investment in domestic compute, indigenous training data and tools, secure data infrastructure, and models that treat Indian languages and lived realities as first-order inputs rather than afterthoughts. If not, India outsources not just computation but cognition itself.



AI today represents a civilisational contest. Nations that fail to develop their own models will eventually think through someone else's, and nations that do not build their own data architectures will find their narratives increasingly shaped by external entities.

India stands at a decisive moment. We can remain privileged tenants in someone else's digital empire, or we can fashion a plural AI future. Just as India built its own space programme, nuclear programme, and digital public infrastructure, it must now build its own sovereign AI stack.

HOW NEW DELHI SHOULD DEAL WITH THE NEW KATHMANDU

The sweeping victory of rapper-turned-politician Balendra Shah and the Rastriya Swatantra Party (RSP) in Nepal's elections held on March 5 sends a strong message to the old guard of the country's political system. It has been decisively rejected. The polls come only six months after youth-led mass protests roiled the country, forced the resignation of KP Sharma Oli as prime minister, and led to the dissolution of its parliament. The Gen Z-led movement, initially triggered by a ban on social media platforms but soon encompassing broader grievances over corruption, unemployment and widening wealth disparities, was part of a wave of youth-driven mobilisations across the world. The challenge, however, has always been in translating mass disenchantment into tangible policy change, the day after. Shah, now poised to become prime minister, has the opportunity to bring change while ushering in a measure of political stability — something Nepal has severely lacked since 2008, having seen more than a dozen governments, none of which completed a full five-year term.

The scale of the shift from the old to the new can be measured by the fact that the RSP is not even four, and Shah is only 35 years old. The new government has no time to waste. Domestic job creation has stalled amid instability. Trade deficits and low wages continue to plague the remittance-driven economy, while inequality — exacerbated by natural disasters and climate vulnerability — has pushed many young Nepalis to leave the country. An equally pressing imperative is to bring an end to the entrenched culture of corruption, with nearly every former PM facing allegations.

For India, which has historically maintained close ties with Nepal's traditional leadership, deepening engagement with the new generation of leaders is essential. New Delhi must also demonstrate the dexterity to engage with Nepal while avoiding the perception of external interference. Finally, India should take the lead in economic cooperation with Nepal. India remains Nepal's largest trading partner and its most accessible market, and greater domestic stability could accelerate connectivity projects and energy cooperation between the two countries. The elephant in the room is China, of course, which has actively backed the communist forces in Nepal. But after the electoral drubbing, Beijing's patronage networks are bound to be disrupted. New Delhi must not fritter away its opportunity to redefine its relationship with Kathmandu.

CHINA'S 'BORDER DEFENCE' VILLAGES AND THE CHALLENGES THEY POSE

China has constructed 72% of its 628 Xiaokang, or "well-off villages," near the Line of Actual Control (LAC) in northeastern states, with 90% in Arunachal Pradesh.



Key Takeaways:

— The details were revealed on Tuesday (March 10) by Deputy Chief of the Army Staff (Strategy), Lieutenant General Rajiv Ghai, during an address at the annual Assam Rifles-USI seminar, who added that many of these settlements are in areas contested between the two countries.

— China has been constructing 628 such Xiaokang or “well-off villages” along India’s borders with the Tibet Autonomous Region for over five years now. These have been constructed all along the LAC, including the Ladakh and Arunachal Pradesh borders.

— The structures include mostly double-storey, large and spacious buildings. The construction for most of these planned villages has already been completed, as per officials.

— The exact purposes of these villages have remained unclear, but they were understood to be dual-use infrastructure — can be used both for civil and military purposes — and have thus been a concern from a defence perspective. The strategic community looks at it as a way to assert Chinese claims over certain areas along the LAC.

— Notably, the exact extent of the LAC has been a source of contention between the two countries for years. India considers it to be 3,488 km long, while China says it is around 2,000 km.

— While China had been constructing them aggressively since 2019, they remained vacant for a long time. However, since late 2023, Chinese nationals have started occupying several of these villages particularly across from Lohit Valley and the Tawang sector of Arunachal Pradesh.

China has also been constructing infrastructure, including border villages, in Bhutanese territory.

— A new law on China’s land borders was brought into effect from January 1, 2022. The law was passed in 2021 by the Standing Committee of China’s National People’s Congress (which is China’s rubber-stamp Parliament), for the “protection and exploitation of the country’s land border areas”.

— The Indian government announced the Vibrant Villages Programme in 2022 to develop its border villages into modern villages with all amenities and as tourist attractions. The programme builds on the existing Border Area Development Programme (BADP) under the Union Ministry of Home Affairs.

— Under the programme, India plans to develop 663 border villages into modern villages in the first phase. Of them, at least 17 such border villages along the borders with China in Ladakh, Himachal Pradesh, Uttarakhand, Sikkim and Arunachal Pradesh, have been selected for development as a pilot project.

— In Arunachal Pradesh, villages in the eastern part of the state and the Tawang region have been identified such as Zemithang, Taksing, Chayang Tajo, Tuting and Kibithu.

— China has been constantly building infrastructure all along the LAC, including in Arunachal Pradesh’s Tawang region and the Siang Valley.

— India has also focused on strengthening its border infrastructure and improving forward connectivity with the construction of new roads, bridges, and helipads. There has also been a push to develop alternate routes to the LAC and improve inter-valley connectivity in the northeast.



Do You Know:

— The LAC is the demarcation that separates Indian-controlled territory from Chinese-controlled territory. India considers the LAC to be 3,488 km long, while the Chinese consider it to be only around 2,000 km. It is divided into three sectors: the eastern sector which spans Arunachal Pradesh and Sikkim, the middle sector in Uttarakhand and Himachal Pradesh, and the western sector in Ladakh.

COVID VACCINE SIDE EFFECTS: WHY SC ORDERED ‘NO-FAULT’ COMPENSATION

The Supreme Court on Tuesday (March 10) directed the Centre to formulate a “no-fault” compensation policy for individuals who suffered serious adverse effects or died after receiving Covid vaccines.

Key Takeaways:

— The court was hearing a batch of petitions led by people who lost their children or spouses — all aged between 18 and 40 years — to rare complications, such as blood clotting disorders, shortly after receiving the Covishield and Covaxin vaccines in 2021. The petitioners argued that the government failed to ensure informed consent and transparently communicate the risks associated with the vaccines. According to them, the vaccination drive, while officially voluntary, was effectively made mandatory through various administrative restrictions on unvaccinated individuals, thereby violating their fundamental rights.”

— The Union government, in its defence, argued that the vaccines underwent rigorous regulatory approvals and that the existing system for detecting Adverse Events Following Immunisation (AEFI) was robust.

— The government maintained that vaccine-related deaths were extremely rare, citing a reporting rate of just 0.001 per one lakh doses in India for certain clotting disorders. It contended that aggrieved families already had a legal remedy: they could approach civil or consumer courts to claim damages for negligence or malfeasance against vaccine manufacturers.

— The Bench, comprising Justices Vikram Nath and Sandeep Mehta, rejected the government’s suggestion to let families approach lower courts individually. It noted that vaccine injury claims involve complex scientific attribution. Insisting on proof of negligence, the Bench noted, “would impose an onerous burden upon affected families and would not be the best solution to those left affected.” Forcing citizens into a multiplicity of individual legal battles would also risk inconsistent outcomes and unequal access to relief, which undermines the guarantee of equality under Article 14 of the Constitution, it held.

— To resolve this, the court invoked the legal principle of “no-fault liability”, which means that a victim or their family can receive financial relief without having to prove that the injury was caused by someone’s negligence or intentional wrongdoing. The court noted that this principle is already recognised in Indian law, such as in motor vehicle accidents, and is a standard feature of vaccine injury schemes in countries like Australia, the United Kingdom and Japan.

— The judgement relied on Article 21 of the Constitution, which guarantees the right to life, including the right to health. The court stated that the Constitution “does not conceive of the State as a distant spectator to human suffering, but as an active guardian of welfare and dignity.” It ruled that since the mass vaccination programme was a State-led public health intervention, the State



bears a positive obligation to support those who suffered grave outcomes, “no matter how rare they are.”

— The court clarified that it was not sitting in scientific review of the vaccines. It referred to its 2022 judgement in Jacob Puliyel vs Union of India, in which it had upheld the legality of the vaccine approval process and the government’s AEFI monitoring mechanisms while ruling that bodily integrity is protected under Article 21 and no individual can be forcefully vaccinated.

— The apex court directed the Ministry of Health and Family Welfare to expeditiously formulate and publish a no-fault compensation framework to address serious adverse events arising from the Covid-19 vaccination drive, while clarifying that this policy shall not be construed as an admission of liability or fault by the Union government.

IN A FIRST, SC ALLOWS PASSIVE EUTHANASIA FOR MAN IN VEGETATIVE STATE FOR 13 YEARS

In a historic first in India, the Supreme Court on Wednesday permitted the withdrawal of artificial life support to Harish Rana, a 32-year-old who has been in a vegetative state for almost 13 years now. The court also urged the Centre to bring a comprehensive law to address passive euthanasia.

Key Takeaways:

— In two concurring judgments, a bench of Justices J B Pardiwala and K V Viswanathan said: “In the facts and circumstances of the present case, we record our satisfaction that the twin legal requirements for the withdrawal and withholding of medical treatment have been unequivocally met. First, it is established that the Clinically Assisted Nutrition and Hydration (CANH) currently being administered to the applicant ... constitutes medical treatment. Secondly, it has been conclusively determined that the continued administration of the same is no longer in the best interests of the applicant.”

— “In light of the unanimous consensus arrived at by the parents/ next of kin and the constituted medical boards respectively, we are of the opinion that the medical treatment ought not to be prolonged any further,” it said, directing that “the medical treatment, including CANH being administered to the applicant, shall be withdrawn and/ or withheld.”

— Citing the “peculiar facts and circumstances of the present matter”, the court “waived the reconsideration period of 30 days... as all stakeholders are unanimous in their opinion that the medical treatment... should be withdrawn and/ or withheld”.

— Reconsideration period refers to the period between the date of decision by medical experts to withdraw life support and date of implementing it, so as to enable a person aggrieved by the decision to approach a court of law.

— The bench asked AIIMS Delhi to admit Rana to its palliative care department “so that the withdrawal and/ or withholding of” his “medical treatment, including CANH, can be given effect to. For this purpose... AIIMS shall provide all necessary facilities for shifting him from his residence to the said palliative care department.”

— “AIIMS shall ensure that such withdrawal and or withholding is carried out through a robust, palliative, and end-of-life care plan which is specifically tailored to manage symptoms without



causing any discomfort to the applicant and ensuring that his dignity is preserved to the highest degree,” the bench said.

— Noting the absence of a comprehensive legislation to address end-of-life care, the bench urged the Centre to enact a law in this regard. Due to absence of such a law, “end-of-life decisions stand imperilled by the possibility that considerations wholly extraneous to medical science or the patient’s autonomy, most notably financial distress, lack of insurance coverage, or socio-economic vulnerability, may imperceptibly shape outcomes,” said Justice Pardiwala.

— The judgement came on a plea by Rana’s family, seeking permission to withdraw medical support in terms of the SC’s five-judge bench ruling in 2018 (Common Cause vs Union of India), recognising the legality of “passive euthanasia” for terminally-ill patients.

— The 2018 ruling laid down detailed guidelines for passive euthanasia, both in cases where the patient left an “advance directive” or “living will” stating that life support should be withdrawn if they slipped into terminal illness, and where no such directive was left behind.

— In January 2023, another five-judge bench modified the 2018 order to make the process of withdrawal of treatment for terminally ill patients less stringent and more workable. The changes included introducing timelines for each board to make its decision and limiting the role of the judicial magistrate in the process.

— Assisted dying involves intentionally causing death through the administration of a lethal injection.

— In India, this directly attracts criminal liability and may amount to culpable homicide under the Bharatiya Nyaya Sanhita. When a doctor assists the patient in performing the act, criminal liability arises for abetment to suicide. Attempted suicide continues to be an offence, even though the Supreme Court has repeatedly observed that a person attempting suicide requires care, not punishment.

— Withdrawing or withholding life-sustaining treatment is treated differently because it involves stopping or not initiating medical intervention and allowing the underlying illness or injury to take its course. This distinction flows from Article 21, the “right to life”, which the Supreme Court has interpreted to include the right to live with dignity.

— For terminally ill or persistently vegetative patients whose life is “ebbing out”, the court has held that the Constitution protects the choice not to be kept alive through invasive or futile medical intervention.

— The Supreme Court’s order allowing the withdrawal of Rana’s treatment is the first application of its passive euthanasia framework, shaped largely by rulings on end-of-life decisions rather than law.

— The judicial position was set out in Aruna Ramchandra Shanbaug v. Union of India (2011). The court reaffirmed its earlier decision in Gian Kaur v. State of Punjab (1996) that Article 21 does not include a general “right to die”. Assisted dying remained outside constitutional protection.

— At the same time, the Bench recognised that the right to live with dignity may, in limited circumstances, include a dignified death.



— The court observed that a premature end to life for a patient in a terminal condition or persistent vegetative state “may fall within the ambit of the ‘right to die’ with dignity as a part of right to live with dignity, when death due to termination of natural life is certain and imminent and the process of natural death has commenced”.

— It drew a distinction. Assisted dying — actively causing death — remained illegal. But withdrawing or withholding life-sustaining treatment could be permitted.

— Active euthanasia is a process in which a physician may prescribe a lethal drug or injection to relieve the suffering of a person with no hope of recovery. It is legal in countries such as the US, Canada, Australia, and parts of Europe — but not in India.

— Passive euthanasia means allowing a person to die naturally by withholding life-sustaining treatment. Patients or their families can refuse treatments such as cardio-pulmonary resuscitation, ventilator support, chemotherapy, radiotherapy, dialysis or specialised nutrition.

— What has made the process easier is knowing the patient’s wishes through a living will. These directives allow terminal patients to create a legal document choosing the measures that they would like or would not like to have done to them when they no longer have the capacity to decide.

— It allows them to choose the type of care they would like to receive, the gender they would like to be addressed as, and it allows a patient to nominate a person to take their medical decisions, which could be someone other than their family.

UCC EFFECTIVE ANSWER, WE LEAVE IT TO WISDOM OF LEGISLATURE, SAYS SC

Strongly backing the case for a Uniform Civil Code (UCC) yet again, the Supreme Court on Tuesday said it is the “most effective answer” to usher in equality in inheritance laws, rather than the court striking down allegedly discriminatory personal law provisions and causing ambiguities.

Key Takeaways:

— “The most effective answer...is the Uniform Civil Code,” Chief Justice of India (CJI) Surya Kant presiding over a three-judge bench also comprising Justices Joymalya Bagchi and R Mahadevan said while hearing a plea challenging provisions of the Muslim Personal Law (Shariat) Application Act, 1937, which the petitioners said discriminated against Muslim women in matters of succession, etc.

— Justice Bagchi added, “Until and unless we can create through our judicial fiat, a equal strata in respect of these asymmetric property rights, including inheritance rights, to strike and declare the personal law as ultra vires will create unnecessary void and in such a situation it may be better to defer to the wisdom of the legislature to bring in one of the fundamental directive principles of state policy, that’s a Uniform Civil Code. And this court has already recommended a UCC for the country.”

— Appearing for the petitioners, Poulomi Pavini Shukla and Nyaya Naari Foundation, Advocate Prashant Bhushan said the provisions discriminate against Muslim women by denying them equal property rights like their male co-religionists.

— Justice Bagchi said that even in Shayara Bano, the judges had taken different approaches. Justice R F Nariman’s view was that the 1937 Act “is statutory recognition of the pre-existing personal law.” Chief Justice J S Khehar, however, “did not agree with that” and held that “even if it is Muslim



personal law protected in terms of Narasu Appa Mali case, it will be violative (of Article 14), not being an essential religious practice”.

— Responding to a query from the bench, Bhushan also pointed out that inheritance is not an essential religious practice but a civil right, and the court can intervene. “In any case, we cannot have a situation in this country today after Shayara Bano and various other judgments, which say that Muslim women will not get the same rights as Muslim men. This is a much more secular issue than the issue of talaq, which was a somewhat more religious issue. This is a totally civil rights issue and needs to be settled once and all by a Constitution bench of this court,” he said.

— Justice Mahadevan then referred to the UCC brought in by the Uttarakhand government in 2024.

— Justice Bagchi said the issue “may have multifarious and manifold impact not just with regard to Muslims, but share in Hindu undivided properties under the Hindu Succession Act, on coparcenary rights” and hence a UCC will be a prudent solution.

Do You Know:

— A Uniform Civil Code would provide for one law for the entire country, applicable to all religious communities, in their personal matters such as marriage, divorce, inheritance, adoption, etc.

— The framers of the Constitution recognised the need for uniform personal laws, but placed it in the Directive Principles of State Policy. Article 44 of the Constitution says that “the State shall endeavour to secure for the citizens a uniform civil code throughout the territory of India”.

— Article 44 is among the Directive Principles of State Policy. Directive Principles are not enforceable by court, but are supposed to inform and guide governance.

JUSTICE FOR ALL

The Supreme Court of India’s sense of hurt at references to judicial corruption in a National Council of Educational Research and Training (NCERT) textbook is in danger of resulting in a serious case of miscarriage of justice. According to the Court, the NCERT’s textbook development team did not have “reasonable, informed knowledge about the Indian judiciary”. The Court went on to direct that persons such as those in the team should not be associated in “any manner with preparation of school curriculum or finalisation of textbooks for the next generation of this country”. This sweeping statement has cast a shadow over the entire exercise of textbook writing. While insisting on independent domain experts such as a senior judge to approve the chapters on judiciary before publication, the Court could have initiated a similar process for other chapters as well, especially for those dealing with history where the misrepresentation of facts is sometimes tinged with bigotry.

In the past, the Bharatiya Janata Party (BJP) and its allied organisations had critiqued Indian textbooks saying that they were Macaulay-an and created “westernised” minds that did not hold India’s past, its traditions, and the Hindu religion as sacred. When the BJP came to power, it sought to redraft the textbooks along these lines. Now, references to Hindu rituals and beliefs are found across textbooks and subjects. For instance, a discussion on solar energy refers to the ritual of “arghyam”, a Vedic salutation to the sun by pouring water. Geography is strictly science, but a geography chapter in a class seven textbook talks about a divine feminine presence pervading the Indian landmass, thereby making it sacred. The Court must apply the same yardsticks it used for



the judiciary chapters to history chapters in the textbooks too. Part 1 of the same social science textbook for class eight describes Muslim rulers as uniformly and singularly cruel, despotic and repressive whereas Hindu kingdoms are portrayed as benign and as resisting Muslim rule. Objectivity is given short shrift, leading to genuine fears that the narrative is to instigate bigotry even though the class eight textbook includes a disclaimer that today's generation is not to be blamed for the 'sins' of the past. Textbook writing requires not just subject matter expertise but also skill that would genuinely kindle knowledge and inquiry as well as train minds towards valuing fairness, equality, peace and harmony. The language is important, so is the intent. Any selective targeting of chapters will only reinforce the perception that the judiciary is merely protecting itself. That, ultimately, would undermine any conception of justice.

'PARENTAL INCOME ALONE CANNOT SET CREAMY LAYER STATUS'

Creamy layer status of Other Backward Classes (OBCs) cannot be decided solely based on parental income and treating similarly placed employees of private entities and Public Sector Undertakings (PSUs) differently from government employees, for deciding whether their wards are entitled to reservation, would amount to hostile discrimination, the Supreme Court ruled on Wednesday.

Key Takeaways:

— A bench of Justices P S Narasimha and R Mahadevan said this while affirming the judgments of High Courts of Madras, Kerala, and Delhi which were dealing with the eligibility of candidates claiming OBC (Non-Creamy Layer) benefit for Civil Services Examinations.

— Some of the HC orders allowed the claims of candidates who contended they were wrongly categorised as falling in the creamy layer on account of the income of their parents who were employed in PSUs, banks or the private sector.

— The dispute centred around the September 8, 1993 Office Memorandum (OM) issued by the Government of India, specifying who shall be creamy layer among OBCs and the clarificatory letter issued in this regard on October 14, 2004.

— The court noted that while the OM excluded income from salary and agricultural income from the Income/ wealth test for determination of creamy layer status, the letter dated October 14, 2004 directed inclusion of salary income of PSU and private sector employees and this resulted in hostile discrimination between the wards of government servants and those of PSU/private sector employees.

— The SC said, "It is... evident from a comprehensive reading of the 1993 OM along with the clarificatory letter dated 14.10.2004 that income from salaries alone cannot be the sole criterion to decide whether a candidate falls within the creamy layer. The status as well as the category of post to which a candidate's parent or parents belong is essential... Mere determination of the status of a candidate as to whether he/she falls within the creamy or the non-creamy layer of the OBCs cannot be decided solely on the basis of the income."

— It said, "Thus, determination of creamy layer status solely on the basis of income brackets, without reference to the categories of posts and status parameters enunciated in the 1993 OM is clearly unsustainable in law."

— The bench said, "Treating the children of those employed in PSUs or private employment etc., as being excluded from the benefit of reservation only on the basis of their income derived from



salaries, and without reference to their posts (whether Groups A, B, C or D) would certainly lead to hostile discrimination between parties who are similarly placed and would amount to equals being treated unequally, thereby attracting the rigour of the equality doctrine under Articles 14, 15 and 16, of which reservation is a facet.”

— It said that “the object of excluding the creamy layer is to ensure that socially advanced sections within the OBCs do not appropriate benefits meant for the genuinely backward; it is not to create artificial distinctions between equally placed members of the same social class.”

Do You Know:

— National Commission for Backward Classes (NCBC) was initially constituted by the Central Govt by the National Commission for Backward Classes Act, of 1993. The act has been repealed through the National Commission for Backward Classes (Repeal) Act, 2018.

— The NCBC has been accorded Constitutional Status through “The Constitution (One Hundred and Second Amendment) Act, 2018, whereby Article 338-B has been inserted, forming a Commission for the socially and educationally backward classes to be known as National Commission for Backward Classes.

— The Commission consists of a Chairperson, Vice-Chairperson and three other Members in the rank and pay of Secretary to the Govt of India and their condition of service and tenure of office has been notified vide Ministry of Social Justice and Empowerment.

MANDATORY MENSTRUAL LEAVE COULD HURT WOMEN’S CAREERS: APEX COURT

The Supreme Court on Friday reiterated its concern that making menstrual leave for women employees mandatory could disadvantage women, as it could make employers wary of recruiting them.

Key Takeaways:

— A bench of Chief Justice of India (CJI) Surya Kant and Justice Joymalya Bagchi said it was better left to the government to take a call on the matter.

— “Affirmative action in respect of women is constitutionally recognised. But look at the practical reality in the job market. The more unattractive the human resource, the less is the possibility of consumption in the market. These are also factors to be looked into...You are right, we will see it from the rights regime. But look at it from the business model. Will an employer be happy with the competing claims of other genders?” said Justice Bagchi.

— The bench initially questioned the locus standi of the petitioner, Shailendra Mani Tripathi, and wondered why no woman had approached the court.

— Tripathi had moved the court twice in the past. The first one was disposed of in February 2023, allowing him to give a representation to the Centre. He moved the court again in 2024, contending that the government had not responded to his representation. The court then asked the government to take a policy decision.

— On Friday, the CJI said, “You are not a bona fide petitioner. This is only to create a type of impression in young women that you still have some natural issues, and you are not at par with male persons, and you cannot work like them during a particular time.”



— Appearing for the petitioner, senior advocate M R Shamshad said Bihar, Karnataka, and Odisha had menstrual leaves while Kerala had allowed it in schools. He added that some private institutions, too, had allowed it.

— The CJI said it was excellent if they were giving leave voluntarily. “That is a very good thing...But the moment you introduce it as a law, as a compulsory condition, you do not know the amount of damage you will do to their career. Nobody will give them responsibilities. Not even in judicial services, a normal trial will be assigned to them,” he added. Creating a right to take leave for two days every month may deter the entire private sector, the CJI said.

Do You Know:

— Saying that the right to menstrual health is a part of the right to life under Article 21 of the Constitution, the Supreme Court recently directed all States and Union Territories to put in place Menstrual Hygiene Management (MHM) measures, including gender-segregated toilets and free sanitary napkins, in all government as well as private schools.

SC TO STUDY WHAT CONSTITUTES ‘PERSONAL DATA’ IN DPDP LAWS

The Supreme Court on Thursday agreed to examine what constitutes “personal data” under India’s new digital personal data law, which allegedly uses data privacy norms to block the right to information.

A three-judge Bench headed by Chief Justice of India Surya Kant said the need to define “public data” and “personal data” has arisen following the implementation of the Digital Personal Data Protection (DPDP) Act, 2023 and its corresponding Digital Personal Data Protection Rules, 2025.

The court issued formal notice to the Union government on a petition jointly filed by journalist Geeta Seshu and the Software Freedom Law Center, represented by senior advocate Indira Jaising and advocate Paras Nath Singh, who said the DPDP laws effectively stall journalists from accessing data of public interest concerning those who hold public offices.

“While enacted under the ostensible objective of protecting personal data, the DPDP laws in effect legalise disproportionate state surveillance, create a compensation vacuum for citizens, dilute the Right to Information, erode the ability of journalists to practice their profession and establish a data protection regulator that is structurally dependent upon the Executive,” the petition said.

For one, the petition said, Section 44(3) of the Act imposes a “blanket ban” on Right to Information (RTI) applications seeking disclosure of ‘personal information’.

“The term ‘public interest’ has been deleted from the DPDP Act. Journalists cannot access data which is in public interest. A journalist need not have personal data, but needs information which is in the public interest to satisfy the public’s right to information and knowledge.” Ms. Jaising submitted.

‘No clear definition’

She said the Act does not clearly define terms such as “information” and “personal”. The state could mount sweeping surveillance on anyone, Ms. Jaising said.

She highlighted how the Act allowed compensation for illegally accessing personal data to go directly to the government and not the injured person.



“While the DPDP Act introduces a penalty-centric framework with fines running into hundreds of crores, such penalties are payable exclusively to the Consolidated Fund of India. The data principal whose privacy is violated receives no compensation, restitution or restoration, even in cases involving identity theft, financial fraud, reputational harm or dignitary injury,” the petition said.

The Chief Justice said a balance had to be struck between privacy and the right to information. One right should not compromise the other, the court said.

“At what point should data regarding a respectable person holding public office be treated as public and when should it be seen as personal?” the CJI asked. The Chief Justice pointed out that an individual’s data privacy has to be protected against sweeping provisions of law. “Entire personal data of the citizenry from a substantial part of the globe are flowing into bigwig private entities. Data has become the true wealth of the day,” Chief Justice Kant said.

The court asked Ms. Jaising to frame questions of law and scheduled the case for detailed hearing on March 23.

SC SEEKS BALANCE; GOVT. SAYS IT RULES DO NOT CURB SATIRE

The Supreme Court on Tuesday sought balance between protecting the nation against fake online content and safeguarding the right to free speech while the Centre defended that its Information Technology Rules was not meant to curb humour, satire or criticism of the government.

“There is no intention under the statute [Information Technology Act] or the Rules to curb any humour, statute, expression of view, critical expression of view and criticism,” Solicitor-General Tushar Mehta, for the Union government, addressed a Bench headed by Chief Justice of India Surya Kant.

In fact, the government had notified the formation of a Fact Checking Unit (FCU) under the Press Information Bureau through a notification issued in March 2024 via the Information Technology (Intermediary Guidelines and Digital Media Ethics Code) Rules, amended in April 2023. The FCU was meant to act as a “deterrent” against the creation and dissemination of fake news or misinformation regarding the “business” of the Centre. The Amendment Rules and the establishment of the FCU had come under the judicial scrutiny of the Bombay High Court through petitions filed by the Editors Guild of India and stand-up comedian Kunal Kamra.

The High Court had, in September 2024, struck down the FCU notification and concluded the amended IT Rules of 2023 “unconstitutional” and violative of Article 14 (right to equality), 19 (freedom of speech and expression) and 19(1)(g) (freedom and right to profession) of the Constitution. It had concluded that the expression “fake, false and misleading” in the Rules was “vague and hence wrong” in the absence of any definition. The High Court had said the government cannot assume the role of the “sole arbiter of truth”.

The Centre appealed in the Supreme Court against the High Court decision, saying it had no subversive intention to crush free speech.

Senior advocates Arvind Datar and N.H. Seervai, for parties including the Editors Guild, Association of Indian Magazines, News Broadcasters of Digital Association and Mr. Kamra, asked who in the FCU would decide if a particular content was fake or not.



“Who mans the FCU? How can such a unit be formed on the basis of a notification? The High Court had merely asked the government to frame proper Rules,” Mr. Datar submitted.

“The question raised in the case is of paramount importance. It would be better for the Supreme Court to lay down the law. The issues flagged by the High Court leads to the question of how to balance rights without destroying the individual constitutional rights,” Chief Justice Kant observed.

The Chief Justice however indicated that some of the online platforms conducted themselves in an offensive manner. “You can damage a personal life... you can damage the nation... I am bothered about the impact on the nation,” the CJI said.

Mr. Datar said whatever was misleading or fake should be taken down. “But then who defines ‘misleading’?” he asked.

Need clear guidelines

“There should be clear guidelines,” the CJI responded, “but, at the same time, shifting all the onus on the state machinery without putting any obligations on those who play mischief requires a lot of consideration” the CJI responded.

“When we see it, we know it is fake,” Mr. Mehta interjected.

Issuing notice on the special leave petition by the Centre, the court refused Mr. Mehta’s request to stay the High Court decision.

GOVT. TOLD X, INSTAGRAM TO TAKE DOWN CRITICAL, SATIRICAL POSTS ON PM, UGC EQUITY REGULATIONS

The Union government has issued a spate of takedown orders for posts satirising, criticising, and mocking Prime Minister Narendra Modi and accounts critical of the government in response to the UGC equity regulations on X and Instagram.

Over the past month, posts that were taken down on X include a reference by Hotmail co-founder Sabeer Bhatia to a viral mistranscription of a Sanskrit subhashita by Mr. Modi; criticism of targeting of minorities in India; and two animated satirical cartoons featuring the Prime Minister.

The Hindu counted dozens of such posts in a review of takedown orders posted by affected users, but comprehensive statistics are not available, as these orders are confidential.

Social media firms comply with takedown orders by making posts invisible in India, while they remain available in other countries.

Three-fold increase

The Ministry of Electronics and Information Technology and the Ministry of Information and Broadcasting did not respond to questions from The Hindu on a sample of these takedown notices. Meta and X did not respond to a request for comment. Data from Meta show that localised takedowns tripled in the first half of 2025 compared with the corresponding period two years earlier.



When The Wire put out two satirical music videos featuring Mr. Modi, they were targeted with takedown notices on both X and Meta's Instagram, and when the site's founding editor, Siddharth Varadarajan, reposted the second cartoon, the repost was also taken down.

The Congress complained that nine AI-generated posts (labelled as such) were taken down in February.

It is unclear how many orders have been issued in recent weeks. X, which used to publish such orders on a third party platform, no longer does so. Orders under Section 69A of the IT Act, 2000, are confidential, one senior official pointed out.

'No choice'

One industry source said that while orders under another Section, 79(3)(b), aren't binding, social media platforms have "no choice" but to comply since the takedown timelines were reduced to two to three hours last month.

Pranesh Prakash, founder, the Centre for Internet and Society, wrote on X that the takedowns were "unconstitutional" as they gave users no prior notice.

On Instagram, an account belonging to an Hindu activist, Sarthak Bhagat, who recently protested against the murder of 26-year-old Tarun Bhutolia in Uttam Nagar, Delhi during Holi, and has over 2.7 lakh followers, was withheld in India.

@woke_kashmiri, another right wing account with over two lakh followers, was also withheld with no explanation. Both accounts also spoke out against the University Grants Commission (Promotion of Equity in Higher Education Institutions) Regulations, 2026.

SAFE NAVIGATION, NOT BANS, TO PROTECT YOUNG

The announcements last week by Karnataka and Andhra Pradesh, of plans to cut social media access for children under 16 and under 13, respectively, are part of a growing global movement to protect young people from digital harm. Animating these proposals are concerns over how excessive screen time and the use of potentially addictive apps may be impacting children's mental health and academic performance. Yet protecting a generation of "digital natives" from the worst effects of the internet calls for more finesse than the blunt instrument of a ban can offer. Not only is a ban likely to be ineffective — workarounds, like proxy devices, are all too easy — it could even be counterproductive if it ends up pushing the vulnerable to the murkier, poorly regulated corners of the internet.

Evidence testifies to the grave harm excessive screen time can cause, especially to young people. Risks such as exposure to dangerous content and cyberbullying and harassment are well documented, as are problems connected to disrupted sleep and lack of emotional regulation. A Pew Research Centre survey of 743 teens in the US noted that 42 per cent report feeling anxious and 25 per cent feel lonely when they are away from their phones. Social media, with the widely-used "endless scroll" feature and a near-infinite menu of short-form content, has been connected to shorter attention spans. Yet, these very platforms also offer spaces for connection, creative expression and education. In India, where inequalities run deep, the internet, including social media, has provided an important bridge to educational resources to children for whom these would otherwise be out of reach. A ban would sever access to these and deepen inequalities.



A more layered approach could lie in the plan for graded restrictions being mulled over by the Union government. It is considering restrictions based on different age brackets. For this approach to be effective, however, there must be consultations with all stakeholders. It will also need to be combined with a digital literacy campaign — one that not only educates children on healthy online behaviour, but also guides parents and teachers on how they can help young people navigate digital spaces safely.

SOCIAL MEDIA BAN MAY MAKE CHILDREN LESS SAFE ONLINE

Meghna Bal and Aaquib Qayoom write- “The Karnataka government’s proposal to ban minors from social media is driven by a familiar concern: Protecting children from excessive screen time and the perceived harms of online platforms. The proposal rests on a flawed assumption — that restricting access will meaningfully reduce children’s engagement with the digital world. However, a survey of 1,000 children across the country aged 10-15 carried out by us indicates that a ban is unlikely to work and may inadvertently make children less safe online.”

Key Takeaways:

— “First, children today are more digitally adept than policymakers assume. Around 69 per cent of the children we surveyed had been using digital devices for more than a year, and nearly half reported being comfortable changing settings on their devices and social media accounts. When users possess this level of familiarity with technology, blanket prohibitions rarely work. Instead, they prompt workarounds — from creating alternative accounts to shifting to platforms that are harder to monitor.”

— “Second, children’s social media use in India frequently operates through a “double-proxy” dynamic. Nearly 71 per cent of the children we surveyed reported using a family member’s social media account. Age-gating mechanisms are, therefore, inherently undermined. Even when children create their own profiles, evidence shows that they circumvent age-based restrictions.”

— “Third, the digital world is not only a space of risk for young people — it is also a space of opportunity. Close to 55 per cent of children surveyed reported positive interactions with strangers online. For many young people, digital platforms may provide communities, learning networks, and sources of emotional support. For instance, a study on LGBTQ+ youth in Australia showed that online communities often serve as safe spaces for children.”

— “Of course, openness to interacting with strangers online also increases the risk of exploitation. But banning social media is unlikely to address these threats. If anything, it may drive children to more private, encrypted or poorly moderated platforms. This would reduce the visibility that parents, educators and regulators have over children’s online activity.”

— “In this sense, a social media ban is an abdication of responsibility towards children. The online world is woven into how children, learn, socialise and express themselves. If policymakers are serious about safeguarding children, they must invest in awareness and sensitisation programs such as integrating digital safety education into curricula. Equally important is equipping parents with the knowledge and tools to guide their children’s online behaviour. The task before policymakers is not prohibition, but preparation.”



Do You Know:

— In today's world, social media has emerged as a powerful force, connecting people on local, national, and international levels like never before due to previous technological advancements. However, it is often referred to as a double-edged sword due to the negative impact it has on multiple fronts

— A report by cybersecurity firm McAfee Corp informs that as many as 85 per cent of children in India have been victims of cyberbullying. Given the lasting emotional harm caused by cyberbullying, coupled with the tender age of its victims, the world of social media becomes an exceptionally challenging turf for parents.

— On the one hand, these platforms offer opportunities to connect with others who share similar identities or who support them. On the other hand, social media platforms also remain active sites of brazen transphobic and homophobic cyberbullying.

— The government of India has taken various initiatives for the effective regulation of social media platforms. Such as, Information Technology (Intermediary Guidelines and Digital Media Ethics Code) Rules, 2021 ("IT Rules").

U.P. ACCOUNTS FOR MOST CASES OF DENIAL OF ACCESS TO PUBLIC SPACES TO PERSONS FROM SC COMMUNITIES

Reported cases of denial of access to public spaces to persons from the Scheduled Caste communities — a crime category that was introduced by the National Crime Records Bureau in 2017 — have been rising across India since authorities started recording them, with Uttar Pradesh holding a large share.

As per the NCRB's 2023 Crime in India report, there were 180 reported cases of SCs being denied access to public spaces under the SC/ST (Prevention of Atrocities) Act across the country. Of these, 173 were reported in U.P. alone, The remaining incidents were reported from Haryana, Himachal Pradesh, Jharkhand, Madhya Pradesh, and Rajasthan.

The NCRB's data for the year before, showed that the country reported 305 of such cases out of which 300 were from U.P. In 2018, the State accounted for 68% of such cases all over India, which rose to 80% in 2019.

For better classification

Ish Kumar, former Director-General of the NCRB, told The Hindu that in 2017, the organisation introduced new columns to "better classify" crimes across India. As a result, new crime heads and classifications were added in the Crime in India reports. The category of crimes under the SC/ST Act — 'Prevent or deny or obstruct usage of public place/passage' — was among the new crime-heads that were added to the series as part of this reform.

In the first year that this crime category was introduced, it noted just 12 cases across the country, spread across States like Himachal Pradesh, Punjab, Karnataka, Kerala, and Maharashtra, while U.P. reported zero. However, U.P. did record 57 cases that year under another newly added category: SC persons being forced to leave their residence or facing social boycott.

Interestingly, a review of this crime category data showed that the number of such cases reported was relatively lower for people belonging to Scheduled Tribe communities.



END OF CHAPTER

An inglorious chapter of unedifying lessons in constitutional statecraft may be ending in Tamil Nadu with the transfer of Governor R.N. Ravi to West Bengal following the sudden and inexplicable resignation of incumbent C.V. Ananda Bose. The gubernatorial change of guard in these poll-bound States comes alongside that of five other States and two Union Territories. Rajendra Vishwanath Arlekar, Governor of Kerala, another State facing elections, will hold additional charge in Tamil Nadu. While Mr. Bose and Mr. Ravi had repeatedly administered political pinpricks to elected governments, Mr. Bose's relations with West Bengal Chief Minister Mamata Banerjee had recently improved. Mr. Ravi made no such allowances to the M.K. Stalin dispensation. As recently as January, he walked out of the Assembly, for the fourth year. Each time, he found a reason or manufactured an excuse for not fulfilling his mandate of delivering the Special Address to the House, under Article 176. Relations between Lok Bhavan and Fort St. George have remained strained since 2022, when Mr. Ravi returned a Bill — instead of reserving it for the President — seeking exemption from the central mandate of NEET-based medical admissions. The House historically readopted and re-sent the Bill to Lok Bhavan. Thereafter, Mr. Ravi created legislative paralysis by indefinitely delaying his decision on Bills, abusing powers under Article 200. He even argued that if a Governor withholds assent, the Bill is “dead”, a position rejected by the Supreme Court in the Punjab case (2023). He chose to continue in office, even after the Court, in 2025, nullified his inaction on 10 Bills and granted them “deemed assent”. Perhaps, he had become immune to controversies. The Home Ministry once forced him to backtrack after he unilaterally dismissed an arrested Minister. On another occasion, the Court rapped him for refusing to administer oath to a Minister whose conviction had been suspended by the judiciary.

Beyond such constitutional misadventures, Mr. Ravi also never fought shy of endorsing right-leaning ideologies, often appearing to position himself as a political opponent of the ruling DMK. He not only dubbed Mr. Stalin's 'Dravidian model' slogan an “expired ideology” but also characterised it as a “sectarian” thought. His posture helped the DMK further its political campaign, accusing the Narendra Modi government of using Mr. Ravi to undermine the popular will expressed through the House. It is difficult to tell whether his transfer is meant to deprive Mr. Stalin of this political weapon or to end Ms. Banerjee's comfort with Mr. Bose in an election season. But one thing appears clear: history may not treat Mr. Ravi's tenure in Tamil Nadu as worthy of emulation in the conduct of Centre-State relations.

ELECTING A RAJYA SABHA MEMBER: THE RULES, PROCESS, AND POLITICS

On March 16, the Assemblies of ten states will elect 37 MPs to Rajya Sabha. This time, the most prominent contestant is JD(U) leader Nitish Kumar who, in a surprise move, has decided to step down as Bihar chief minister after a 21-year tenure. Another major leader contesting from Bihar is BJP chief Nitin Nabin.

Key Takeaways:

- Rajya Sabha has up to 250 members, 12 of whom are nominated for their special knowledge of literature, science, art or social service. The others are elected.
- Unlike Lok Sabha, whose members are directly elected by citizens aged 18 and above, Rajya Sabha members are elected by state Assembly members through the system of proportional representation by a single, transferable vote.



— Rajya Sabha MPs representing Delhi and Puducherry are elected by members of an electoral college comprising the MLAs of these Union territories. The Union territories of the Andaman and Nicobar Islands, Lakshadweep, Dadra and Nagar Haveli, Daman and Diu, Chandigarh, and Ladakh do not have representation in Rajya Sabha. Jammu & Kashmir, however, does.

— The minimum age to be a Rajya Sabha MP is 30. Also, a person qualified to be chosen as a representative of any State or Union territory must be an elector for a parliamentary constituency in that State or territory, say MN Kaul and SL Shakhder in their book Practice and Procedure of Parliament.

— The term of a Rajya Sabha member is six years, and one-third of the members retire every two years. This ensures continuity, as Rajya Sabha is a permanent body that is never dissolved, unlike the Lok Sabha.

— For filling the seats of members retiring from Rajya Sabha on the expiration of their term, the President, “by one or more notifications published in the Gazette on such date or dates as may be recommended by the Election Commission, calls upon the elected members of the Legislative Assembly or, as the case may be, the members of the electoral college of the State concerned to elect members of the Rajya Sabha in accordance with the provisions of the Representation of the People Act, 1951, and of the rules and orders made thereunder,” say Kaul and Shakhder.

— “...The Returning Officer fixes, with the previous approval of the Election Commission, the place at which the poll is to be taken for such election and notifies the place so fixed in such manner as the Election Commission may direct. The Returning Officer also presides over such an election at the place so fixed and appoints such polling officer or officers to assist him as he thinks necessary...”

— How many votes does a candidate need to win an election?: This depends on the strength of the Assembly of the state concerned. States with high populations have more seats and states with smaller populations have fewer seats.

— A formula is used to calculate the quota required for a candidate to win. The total number of MLAs voting in a state is divided by the number of seats going for elections plus 1. Then, 1 is added to the resulting number to calculate the quota. Let’s understand this with the help of an example.

Say the total number of MLAs voting in a state is 200 and elections are on for four seats.

In that case, 200 will be divided by 4+1, or 5, which will result in a figure of 40.

The quota thus will be 40+1, or 41. Any candidate getting 41 votes will be declared elected.

— However, the system followed is that of a single transferable vote. So MLAs who vote — there is an open ballot in Rajya Sabha polls — can mark their first, second, third, etc preferences.

— In the above example, every candidate getting 41 first preference votes will be declared elected. If this does not fill all the seats, the surplus votes of those already elected are transferred to the second preference candidates of MLAs whose first preferences have already won.

Do You Know:

— In terms of the constitutional power of Parliament, the Rajya Sabha has equal power with the Lok Sabha. A Constitution Amendment Bill can be introduced in either House of Parliament and



has to be passed by each House. There is no provision for a joint sitting of both Houses to resolve a deadlock on a Constitution Amendment Bill.

— Rajya Sabha enjoys some special powers. If it passes a resolution by a majority of not less than two-thirds of members present and voting, saying that it is “necessary or expedient in the national interest” that Parliament should make a law on a matter enumerated in the State List, Parliament becomes empowered to make a law on the subject. Such a resolution remains in force for a maximum of one year but this period can be extended by one year at a time by passing a similar resolution.

— A similar route can be adopted for recommending the creation of one or more All India Services common to the Union and the states. Parliament becomes empowered to create such services.

SEEKING OUSTER OF ‘PARTISAN’ CEC, OPPOSITION SUBMITS NOTICES IN BOTH HOUSES

Citing charges including “partisan and discriminatory conduct” and “obstruction of investigation into electoral fraud and SIR” (Special Intensive Revision of electoral rolls), the Opposition on Friday submitted notices in both Houses of Parliament for an impeachment motion against Chief Election Commissioner (CEC) Gyanesh Kumar.

Key Takeaways:

— A senior TMC MP told The Indian Express that 120 Lok Sabha members and 73 Rajya Sabha members had signed the notices. “A total of 17 Opposition parties have supported the notice. It has been submitted in both Houses,” the MP said.

— As per procedure, the notice has to be signed by at least 100 members if moved in the Lok Sabha and 50 members in the Rajya Sabha. This is the first time a notice is being moved for the removal of a CEC.

— However, the Opposition’s move is largely symbolic, given the ruling NDA’s clear numerical advantage in both the Lok Sabha and Rajya Sabha. But it has political significance as it comes days before the EC is expected to announce the Assembly election schedule for the states of West Bengal, Assam, Kerala and Tamil Nadu, and the Union Territory of Puducherry.

— According to sources, the Opposition has listed several charges against the CEC, including “proven misbehaviour”, “partisan and discriminatory conduct”, “SIR exercise and mass disenfranchisement”, “compromised appointment”, “obstruction of investigation into electoral fraud and SIR”, “contempt of Supreme Court”, and “failure to maintain independence”.

— The process for seeking the CEC’s removal is similar to that of impeaching a Supreme Court judge. Article 324 (5) of the Constitution states that “the Chief Election Commissioner shall not be removed from his office except in like manner and on the like grounds as a Judge of the Supreme Court and the conditions of service of the Chief Election Commissioner shall not be varied to his disadvantage after his appointment”.

— The grounds for the removal of the CEC and other election commissioners (ECs) are also laid down in Section 11 (2) of the Chief Election Commissioner and other Election Commissioners (Appointment, Conditions of Service and Term of Office) Act, 2023, which regulates the appointment, conditions of service, and term of office of the CEC and the ECs.



— The procedure for the removal of a Judge is laid down in the Judges (Inquiry) Act, 1968. It stipulates that a complaint against a judge is taken up if it is signed by at least 100 members in the Lok Sabha and 50 members in the Rajya Sabha. Once the motion is submitted, the presiding officer of the House takes a call on whether to accept or reject it.

— If the motion is admitted, the Speaker or the Chairman of the House constitutes a three-member investigative committee.

— The committee then frames charges based on which the investigation is conducted. After concluding its investigation, the committee submits its report to the Speaker or Chairman, who then has to lay the report before the relevant House. If the report records a finding of misbehaviour or incapacity, the motion for removal is taken up for consideration and debated.

— For the motion to go through, at least two-thirds of those “present and voting” in both the Lok Sabha and the Rajya Sabha must vote to remove the judge, and the number of votes in favour must be more than 50 per cent of the “total membership” of each House. Once both Houses adopt the motion by a special majority, it is sent to the President of India.

Do You Know:

— The Part XV of the Constitution of India deals with Elections. It has the following articles (Articles 324–329) to empower the Election Commission and provide insight into the potential roles and functions of the commission.

— Article 324 says, The superintendence, direction and control of the preparation of the electoral rolls for, and the conduct of, all elections to Parliament and the Legislature of every state and of elections to the offices of President and Vice-President.

BENGAL SIR TEST: READING THE SC'S ORDER

The story so far:

On February 20, 2026, the Supreme Court invoked its powers under Article 142 of the Constitution and decided to deploy judicial officers in the State of West Bengal to adjudicate and revisit cases and documents submitted under the category of “logical discrepancies” and “unmapped cases” for inclusion or exclusion of names from the electoral roll. This course of action was adopted when the second phase of the special intensive revision (SIR) of electoral rolls was nearing completion.

The Court intervened after the Election Commission of India (EC) submitted before the court that, despite repeated requests, the State had not provided Group ‘A’ officers of the rank of SDO/SDM to carry out the quasi-judicial functions of Electoral Registration Officers (EROs). According to the EC, instead of such officers, personnel at clerical levels and from Group ‘B’ and ‘C’ cadres were deployed, making it untenable to entrust them with the adjudication of cases involving scrutiny of documents in a number of cases. The State, however, disputed this assertion before the Court.

Against this backdrop, the Supreme Court initially sought the assistance of judicial officers from West Bengal and, by subsequent orders, facilitated the deployment of additional judicial officers from neighbouring Odisha and Jharkhand (subject to the discretion of the Chief Justice of the Calcutta High Court), having regard to the nearly 60 lakh cases requiring adjudication.



Why was the Court compelled to intervene?

Earlier, on February 4, 2026, when the Chief Minister of West Bengal chose to appear in person before the Supreme Court in the SIR matter, the hearing drew nationwide attention. Still, the Court made it clear that it would not permit any impediment to the continuation of the SIR process.

During the second phase of the SIR in West Bengal, the State challenged the decision of the EC to deploy Micro-Observers to assist the EROs/Assistant EROs, contending that such deployment was contrary to law. The EC justified the step on the grounds that it was compelled to do so due to the non-availability of adequate Group 'A' officers of the rank of SDO/SDM despite repeated requests to the State.

Another concern raised by the State related to the notices issued under the 'logical discrepancies' category, which it alleged were contrary to the SIR guidelines and issued on an ad-hoc basis. The EC contended that such verification was necessary and in accordance with the SIR, as in several cases electors had been incorrectly or wrongly linked to the last SIR.

Even after extensions of time for hearings, nearly 60 lakh cases are pending adjudication in West Bengal. This stands in contrast to similarly placed States such as in Tamil Nadu and Kerala, which were able to complete the SIR exercise within the prescribed and extended timelines. While the immediate dispute concerned the conduct of the SIR in West Bengal, the episode exposes a deeper institutional gap in India's electoral framework.

Has the time come to equip EC with permanent staff machinery?

At the heart of the issue is a structural feature of India's electoral system: the EC does not have a permanent staff of its own for the preparation of electoral rolls or the conduct of elections. Instead, it functions through personnel requisitioned from the Central and State governments under the constitutional scheme.

This question was debated in the Constituent Assembly during the consideration of draft Article 289 (present Article 324). While Dr. B.R. Ambedkar, in moving the clause, observed that the EC's work would be uneven and argued that creating a separate permanent machinery could lead to duplication of machinery and unnecessary expenditure, Mr. R.K. Sidhwa, representing the Central Provinces and Berar, expressed a contrary concern that bears relevance in the current episode.

Mr. Sidhwa argued that reliance on staff drawn from the provinces would render the scheme imperfect, since such personnel would ultimately remain responsible to the executive. If the executive were inclined to play mischief, it could issue informal or even secret instructions to such staff to act according to its behests, which they may well comply with as their permanent duty ultimately lies with the executive. He therefore advocated a Commission with its own machinery, contending that such a body could ensure a permanent and accurate electoral roll.

The controversy surrounding the deployment of EROs in West Bengal revives the unresolved institutional question: whether the time has come to equip the EC with a permanent machinery, at least for the preparation and continuous updation of the rolls.

What does publication of the final roll mean?

While the final roll published on February, 28, 2026, has 7.04 electors at present, nearly 60 lakh cases remain pending adjudication before judicial officers. Upon such adjudication, eligible



electors would be included by way of supplementary lists. Further, as names may be added up to one day prior to the date of nomination, the present figure of 7.04 crore is likely to increase.

Holding the line: the ECI's institutional stance

The Supreme Court's decision to facilitate the deployment of judicial officers strikes a careful balance between ensuring the timely completion of the SIR, in view of the upcoming elections, and imparting the degree of seriousness that the exercise inherently warrants. Equally, the EC's stance justifies the trust reposed in it by the Constitution's framers under Article 324—to safeguard the integrity of the electoral roll.

MORE WOMEN DELETED FROM ROLLS IN MOST STATES AFTER SIR

The Election Commission of India's (EC) Special Intensive Revision (SIR) of electoral rolls — a large-scale exercise aimed at updating voter lists — is being carried out across 12 States and Union Territories (UTs) covering close to 51 crore voters. The enumeration phase of the exercise began in November 2025. Among these States and UTs, Tamil Nadu, Kerala, West Bengal, and Puducherry are scheduled to go to the polls in April 2026.

The first round of the clean-up exercise was carried out earlier in Bihar, where more than 65 lakh names were deleted from the electoral rolls and the gender ratio fell sharply from 907 women per 1,000 men to 892 women after the SIR.

The Hindu had found that the exclusions were higher in the 18-29 age category, with one of the primary reasons being that the women had 'permanently shifted'. The EC had then said in the Supreme Court that women's names would have been excluded as they had migrated to other States after marriage. Yet, The Hindu's data stories had shown that more men migrated for work than women who migrated for marriage, according to the Census and later surveys. This raises the question of whether similar patterns are visible in other States where the SIR exercise has been carried out.

Decline across States

Data from the 2024 Lok Sabha election rolls and the final SIR rolls show that while the drop in gender ratio is not as steep as in Bihar, all major States have recorded a decline in the proportion of women voters relative to men after the revision. Tamil Nadu is the notable exception, where the gender ratio improved, even though the State witnessed one of the largest reductions in total electors following the exercise.

Uttar Pradesh has not been included in this analysis as the final electoral roll for the State is yet to be published. The EC has extended the revision schedule multiple times and the final roll is now expected to be released on April 10.

In West Bengal, the gender ratio fell from about 966 women per 1,000 men in the 2024 Lok Sabha rolls to around 956 after the SIR revision. The State also recorded one of the largest reductions in its electorate — a 8.06% decline.

Nearly 60 lakh people are still being adjudicated for "logical discrepancies" but are part of the rolls so far.



The gender ratio in Gujarat recorded a sharper shift as it fell from roughly 945 women to about 938 in the final SIR rolls. The total electorate declined from 5.08 crore to 4.4 crore, a reduction of 13.4% of the electorate.

Madhya Pradesh also saw a decline in the gender ratio after the revision, from 945 women to 934 in the final SIR rolls.

The State's electorate shrank from about 5.74 crore voters before the SIR to 5.39 crore in the final rolls, a reduction of around 34.25 lakh electors (5.97%).

The number of women electors in Rajasthan fell from about 2.56 crore to 2.45 crore, while the number of male electors declined more modestly. The gender ratio dropped from 920 to 911. Overall, the State's electorate witnessed a 6.13% reduction.

In contrast, Tamil Nadu, one of the States where women form a majority on the electoral rolls, recorded an improvement in the gender ratio.

The ratio increased from 1,034 women per 1,000 men in the 2024 rolls to 1,044 in the final SIR rolls. But the total electorate in the State declined from 6.41 crore to 5.67 crore, a reduction of about 74 lakh electors, or 11.5% from the pre SIR rolls.

However, Kerala, another State with a higher number of women voters than men, saw a decline in the gender ratio after the revision. The ratio fell from 1,064 to 1,053 in the final SIR rolls, though women continue to remain more numerous than men on the electoral rolls. The total electorate also declined by about 3.2%.

Similarly, women continue to slightly outnumber men in Chhattisgarh although the ratio fell from 1,016 to 1,002 in the final SIR rolls. The total electorate declined by about 11.77%.

Goa is also among the States where women continue to outnumber men. But the State's electorate saw a significant contraction. The total number of voters saw a decline of around 10.7% of voters.

Status of Union Territories

Among Union Territories, Puducherry has historically seen higher women participation and representation on the rolls and has continued to show a strong female presence even after the revision. However, the total number of voters declined from about 10.2 lakh to 9.4 lakh, representing a 7.5% reduction.

In the Andaman and Nicobar Islands, the gender ratio rose from 919 to 979 after the revision. The number of female electors fell by a smaller margin compared with male electors, leading to an increase in the ratio even as the overall electorate dropped significantly. The rolls declined from 3.1 lakh to about 2.58 lakh voters, representing a reduction of 16.8%, the largest proportional declines among the regions analysed.

Lakshadweep, on the other hand, saw only a marginal increase in the gender ratio from 968 women voters to 971 in the final SIR rolls. The Union territory recorded almost no change in its electorate with just a 0.3% drop.



A SEISMIC DECISION

The Centre's rollback of the revision to India's earthquake zoning by the Bureau of Indian Standards (BIS), follows a major challenge to the methodology used, which some engineers believe are out of sync with site-based evaluations. Yet, the reversal is driven largely by the massive cost and execution implications, as the decision impacts urban planning, disaster preparedness and climate resilience. The current earthquake zoning exercise is an opportunity to disaster- and climate-proof cityscapes, power infrastructure, dams, highways, and homes and offices as India undertakes an urban infrastructure expansion. Getting the zoning framework right has, arguably, never been more important.

At the heart of the debate lies the scientific approximation of possible earthquakes and their intensities, vis-à-vis the preparedness of the built environment to withstand them. Globally, most advanced economies and seismically active regions now use Probabilistic Seismic Hazard Assessment (PSHA), a dynamic framework that models earthquake risk through probability-based simulations of ground motion. Until now, India has primarily used a simpler fixed zoning model. The BIS's attempt to move toward this globally accepted framework is, therefore, directionally correct. However, some structural engineers and policymakers argue that the revisions, which were notified in November 2025 and withdrawn on March 3, were too stringent. The proposed framework introduced an entirely new top-risk category, Zone VI, covering most of Kashmir, parts of the Himalayan belt, Kutch in Gujarat and the north-east. Urban planners worry that such zoning could stall developmental and infrastructure activity in already economically fragile regions, and potentially push more housing into the informal sector — which already accounts for nearly 80% of India's homes. Estimates suggest that a one-zone increase could raise costs by around 20%, and two zones by nearly one-third. For major infrastructure such as metro rail systems, dams and power stations, the cost implication could be significantly higher. Pushback to the BIS revisions has come from both the private sector and within government, including the Ministries of Housing and Urban Affairs, Home Affairs, the Central Water Commission and the National Dam Safety Authority. Another layer in this debate is climate. The construction sector in India is among its largest dispersed sources of carbon emissions. While a revision in the earthquake zoning framework is necessary, it requires wider consultation across ministries, regulators and industry stakeholders. Only a holistic and implementable framework can strengthen disaster resilience and address climate mitigation, affordability and execution challenges.

BITTER MILK

The events in Rajamahendravaram in Andhra Pradesh involving the mass poisoning of consumers by milk contaminated with ethylene glycol sound a regulatory alarm. As of March 8, the death toll was 11, with approximately 20 other people, including infants, hospitalised. The police have invoked Sections 103 (punishment for murder) and 105 (culpable homicide not amounting to murder) of the BNS. The vendor allegedly continued to supply the milk despite complaints about a bitter taste and being warned that a coolant leak could be poisonous, so it seems reasonable that the State is treating gross negligence in food safety as a serious criminal offence. However, there could also be counterproductive effects. Milk is a staple in Indian households and contamination by an industrial compound already infamous in India for its lethality carries the potential to trigger a crisis of confidence in local, unbranded milk supplies. Children and the elderly are most affected by ethylene glycol poisoning due to their higher metabolic sensitivity and lower renal reserves, respectively. This could push people towards pasteurised milk from regulated

4TH FLOOR SHATABDI TOWER, SAKCHI, JAMSHEDPUR



cooperatives such as Amul or Vijaya, which seems desirable, but a large share of milk is also distributed in India through small vendors. Since the State has invoked criminal charges, including 'murder', against the offenders, marginal actors may quit the market or shift further into informality, which can paradoxically undermine oversight.

Though the State may be projecting a strong hand at work by criminalising the vendor's alleged conduct, the importance of regulations cannot be overstated. Food-safety compliance is as much about punishing bad actors as about reducing the cost of doing the right thing. In the informal supply chain, cold-chain monitoring and hygiene inspections are almost entirely absent, leaving room for contamination. Subsidised testing kits and cooperative chilling facilities can thus reduce the risk at small dairies. Regulators may also consider safe-harbour provisions that ease penalties for dairy operators who report contamination at their facilities; this could also encourage early disclosure, giving authorities time to save lives. But this also makes consistent enforcement crucial. That a dairy could operate without a safety licence for 11 years raises serious questions about the oversight of the local government and the FSSAI: the local authorities failed to conduct periodic field audits, and the FSSAI did not enforce standardised safety protocols. The risk of being detected becomes negligible and even the harshest criminal charges cannot amount to a meaningful preventive measure. An effective system must realise that reliably detecting violations and imposing timely sanctions are a better deterrent than stringent penalties that do not aid enforcement and rarely lead to convictions.

FOR INDIA, OBESITY COMPLICATES THE NUTRITION CHALLENGE

A significant section of Indian children does not consume the amount of calories required for healthy growth. Addressing the problem of food insecurity remains a work in progress. At the same time, another rapidly expanding concern has complicated the policymakers' challenge. Studies and surveys show that many children are consuming diets high in sugar, refined carbohydrates, salt and unhealthy fats. The World Obesity Atlas, released last week by the World Obesity Federation, estimates that more than 40 million children in India are either overweight or obese. As in many parts of the world, this trend is driven by sedentary lifestyles, urbanisation and greater access to processed foods. However, unlike many developed countries where the dietary transition unfolded gradually over several decades, in India much of this shift has occurred in the last 15 years. Therefore, even as malnutrition remains widespread, India now ranks second globally in the number of overweight and obese children.

Children at both ends of the nutritional spectrum lack adequate proteins, vitamins and essential minerals in their diets. According to the WHO, excess body weight during childhood significantly increases the risk of conditions such as type 2 diabetes and cardiovascular diseases later in life. The coexistence of undernutrition and obesity could, therefore, aggravate India's already formidable non-communicable disease challenge.

One reason for the rapid expansion of childhood obesity is the limited availability of reliable information about healthy diets. In this context, the directive issued last year by the CBSE, asking affiliated schools to display information about the recommended sugar intake, is a welcome step. Efforts to induce behavioural change can, however, address only part of the problem. Policy initiatives, such as the POSHAN Abhiyan, have also approached the nutrition challenge from the standpoint of calorie intake. They have overlooked its broader socioeconomic dimensions. A growing body of research, including a 2020 study published in Indian Paediatrics, suggests that obesity is no longer confined to affluent households — children in families with limited access to healthy food options may rely on relatively inexpensive, calorie-dense processed foods. A survey



by UNICEF last year found that nutritional deficits among children are often a carryover of the poor dietary habits of their mothers. Addressing this emerging epidemic will require a public-health response that combines nutritional awareness with stronger junk-food regulation, women's empowerment and initiatives that nudge people towards healthier lifestyles. Else, the promise of India's demographic dividend could be weighed down by a complex health burden.

WHEN THE STATE PAYS FOR BABIES: SOME LESSONS FROM SIKKIM

When Andhra Pradesh Chief Minister N Chandrababu Naidu recently proposed a cash incentive of Rs 25,000 for couples having a second or third child, it revived an important question about India's demographic future: Can governments reverse falling birth rates through financial incentives?

Key Takeaways:

- Andhra Pradesh today records a total fertility rate of roughly 1.4 children per woman, significantly below the replacement level of 2.1. Concerned about the long-term economic fallouts of an ageing population, the state is exploring ways to encourage larger families.
- The idea of paying couples to have more children may appear bold. Yet India has already seen a similar experiment, one that has been underway for several years in Sikkim.
- Around 2022, Sikkim rolled out a series of incentives designed to encourage couples to have more children. These amounted to perhaps the most comprehensive pro-natalist policy attempted by any Indian state.
- The idea was straightforward: If raising children became financially less burdensome, families might feel encouraged to expand. But the policy went much further. Women government employees were offered state-funded childcare attendants to assist them after childbirth. This was intended to reduce the conflict many working women face between professional responsibilities and parenting.
- The incentives were not limited to government employees. Mothers working in the private sector were also included... Perhaps the most innovative aspect of Sikkim's policy addressed a factor often ignored in demographic debates: Infertility. Interestingly, the state chose to tackle it directly.
- Under the Vatsalya scheme, the government offered financial assistance for in vitro fertilisation (IVF) treatment to couples unable to conceive naturally.
- Together, these policies formed a comprehensive approach: Financial incentives, childcare support for working mothers, expanded parental leave and even government-backed fertility treatment. Despite these incentives, Sikkim's fertility rate remains extremely low and the anticipated baby boom has not materialised.
- Governments across the world have tried to encourage childbirth through financial incentives and social benefits. Yet the results have rarely matched expectations.
- Take Singapore, TFR about 1.0. For decades, the city-state has offered generous baby bonuses, tax rebates, subsidised childcare and housing incentives for families with children. Despite these measures, its fertility rate has continued to decline and remains among the lowest in the world.



— Across modern societies, fertility decline is driven by deeper structural changes. Women marry later and pursue longer careers. Urban lifestyles raise the cost of housing, education and, increasingly, childcare.

— Many couples prefer to invest more resources in fewer children rather than raise larger families. In such circumstances, a one-time payment or monthly subsidy, even a generous one, may not significantly alter the fundamental calculus of family life.

— This does not mean governments should do nothing. International experience suggests that fertility responds less to one-time incentives than to long-term confidence in family life. Countries that have managed to stabilise birth rates, such as France and the Nordic states, did so by making parenthood compatible with modern life through affordable childcare, predictable parental leave, flexible workplaces and housing support.

— Seen in this context, Andhra Pradesh's proposal should perhaps be viewed less as a definitive solution and more as a policy experiment. Sikkim's experience offers a useful lesson. Demography moves slowly but powerfully.

— Governments may attempt to encourage childbirth through incentives and subsidies, but the decision to bring a child into the world ultimately reflects a family's confidence in its economic future and social stability. That confidence cannot simply be purchased.

Do You Know:

— India's Total Fertility Rate (TFR) – the average number of children per woman – has dropped to 2.0, according to the United Nations Population Fund's (UNFPA) State of World Population Report 2025. The same was also reported in the National Family Health Survey (NFHS-5) of 2019-21.

— A TFR of 2 is considered the replacement level as two kids will replace their parents. But since some kids die, the replacement level is considered as 2.1. Hence, India's TFR has fallen below the replacement level of 2.1.

— There are notable regional variations in fertility rates across India. According to the NFHS-5, only five states – Bihar (2.98), Uttar Pradesh (2.35), Jharkhand (2.26), Meghalaya (2.91), and Manipur (2.17) – still exceed the replacement rate of 2.1. In comparison, southern and western states such as Kerala, Tamil Nadu, Maharashtra, Karnataka, and Gujarat report fertility levels below replacement levels – ranging from 1.6 to 1.9. The TFR has also declined in both urban (1.6) and rural (2.2) areas.

— High fertility rates are often associated with pressure on public infrastructure and lower levels of women's education and agency, while low fertility rates raise concerns about better economic and social security.

CABINET CLEARS RS 1.51 LAKH CR FOR JAL JEEVAN WITH DIGITAL MAPPING

Months after the Centre launched a crackdown on widespread irregularities in the implementation of Jal Jeevan Mission (JJM), its showpiece rural drinking water scheme, the Union Cabinet on Tuesday approved an additional allocation of Rs 1.51 lakh crore for the initiative till 2028 — with digital mapping to ensure “transparency and accountability”.



Key Takeaways:

— Union I&B Minister Ashwini Vaishnaw told reporters that the scheme will have an overall outlay of Rs 8.70 lakh crore till 2028. Of this amount, the Centre’s outlay will now be Rs 3.59 lakh crore, including Rs 2.08 lakh crore allocated in 2019.

— Taking to X later, PM Narendra Modi said that the decision “marks a major step towards ensuring sustainable and reliable tap water supply for rural households”. “It shifts the focus from only infrastructure creation to citizen-centric service delivery supported by strong local governance and digital monitoring. The move will strengthen water security, improve health outcomes and empower rural communities, especially our Nari Shakti,” he posted.

— According to an official statement, a uniform national digital framework called “Sujalam Bharat” will also be set up to digitally map the supply system “from source to tap”. Besides, in the second phase, separate MoUs will be signed with states within three months to ensure structural reforms.

— The Cabinet’s approval comes more than a year after Union Finance Minister Nirmala Sitharaman announced the extension of the scheme till 2028 with “an enhanced total outlay” while presenting the Union Budget last year.

— The amount, however, is much lower than what was initially sought by Jal Shakti Ministry, the nodal ministry responsible for implementing JJM.

— Launched in August 2019, JJM initially aimed to deliver 55 litres per capita per day of drinking water to all rural households by 2024.

— Under the new digital framework, the official statement said, “every village shall be assigned a unique Sujal Gaon/ Service Area ID, digitally mapping the complete drinking water supply system from source to tap”.

— “For ensuring transparency and accountability”, Gram Panchayats and Village Water & Sanitation Committees will be involved “in the commissioning and formal handover of schemes,” it said. “A Gram Panchayat shall certify completion of works and declare itself ‘Har Ghar Jal’ only upon confirmation that adequate in-village operation and maintenance mechanisms have been established by the State Government,” the statement said.

Do You Know:

— Entry 17, State List (List II), Seventh Schedule of Indian constitution says, “Water, that is to say, water supplies, irrigation and canals, drainage and embankments, water storage and water power subject to the provisions of entry 56 of List I.” It means that states have the authority to legislate on water-related issues such as irrigation, water supply, canals, and embankments within their territory.

WHAT IS THE MUSI RIVERFRONT DEVELOPMENT PROJECT?

The story so far:

Musi River flows through Hyderabad for 55 km and looks like an open sewage channel most of the year, except during the monsoon. Now, the Telangana government wants to turn the seasonal river into a perennial one by ensuring year-long flow, and develop leisure spaces, shopping areas,



and heritage structures on the river's banks. But for people who have been living on the river bank for decades, this spells displacement.

What is at stake?

The Musi River, with an aggregate length of about 260 km, is created by the confluence of two rivulets – Musa and Esi originating in Ananthagiri hillocks of Vikarabad district in Telangana.

The destructive floods of 1908 prompted the last Asafjahi king Mir Osman Ali Khan of the Hyderabad princely state to commission two tanks – Osman Sagar and Himayat Sagar – which act as flood control reservoirs for the river. Various governments – the Telugu Desam Party's in 1997-98, the Bharat Rashtra Samithi's in 2017 and the Congress's now – have attempted to develop the river as an urban water front.

What does the development entail?

The project envisages development on both sides of the river's 55-km course. However, the detailed project report is yet to be approved. The government also proposes to channel 2.5 tmcft of water from the Godavari River through Mallanna Sagar Reservoir, 72 km away from the city, to fill the twin reservoirs, for staggered release into the Musi River to keep it flowing throughout the year.

Also in the pipeline are 39 more sewage treatment plants in addition to the existing 31 STPs to treat the sewage entering the river from across the city.

What has happened since?

In October, 2024, the State government constituted a consortium of five companies for the preparation of a DPR. Almost simultaneously, the government went ahead with the eviction and relocation of residents from the slums on the riverbed, which drew severe backlash.

The government later decided to begin the project on the relatively unoccupied stretches along the Musa and Esi rivers, covering 21 km. The 'world's tallest' Gandhi statue as the centre of a sprawling cultural precinct is proposed at the confluence of the two rivers, named 'Gandhi Sarovar'.

The first phase of the Musi Riverfront Development project has received in-principle approval for funding from the Asian Development Bank (ADB), while the final approval is awaited.

Who is opposing the project?

Protests against the project took shape after the forced eviction of people from the slums on the Musi riverbed in 2024. A coalition of residents, voluntary organisations and activists was forged under the umbrella of 'Musi Jan Andolan' to take the government head-on. Their main objection is to the way the project is sought to be carried out, treating Musi residents as obstruction rather than as partners in the rejuvenation of the river. They question the urgency with which the government is moving forward without even a detailed project report being made available in the public domain.

Controversy erupted once again recently, when the government issued three land acquisition notifications in relation to the project. Residents of a gated community close to the confluence



point have risen in opposition as their properties were listed for acquisition in one notification to facilitate the 'Gandhi Sarovar' project.

FOREST SURVEY OF INDIA STOPS ITS AI-BASED FORTNIGHTLY ALERTS TO STATES ON DEFORESTATION

The Forest Survey of India (FSI), the central government organisation that is responsible for the assessment and monitoring of India's forest wealth, has stopped issuing the fortnightly alerts through which it has kept a watch on deforestation activities in near-real time for more than two years.

Key Takeaways:

— The data on the FSI's Anavaran-Deforestation Alert System have not been updated since November 2025.

— The portal, which has been operational since January 2024, has been using satellite data and machine learning to enable FSI to issue location alerts on the loss of forest cover to states every 15 days so that targeted field inspections can be carried out.

— According to multiple sources, active monitoring through the portal was halted this January, and states stopped receiving the fortnightly deforestation alerts.

— Asked why the portal had stalled, FSI joint director Shivani Dogra said Anavaran had been running only as a pilot project, and its utility was currently being assessed.

— Sources in the Rajasthan Forest Department said the state had not received any deforestation alert after December 2025.

— While publicly available Anavaran data do not quantify the area of deforestation, records show that Punjab (637), Andhra Pradesh (617) and Arunachal Pradesh (611) accounted for the highest number of deforestation alerts, followed by Nagaland (579), Manipur (577), Uttarakhand (543), Assam (533), Tripura (516), Maharashtra (504), Mizoram (499), Gujarat (498), and Karnataka (450).

— The Anavaran alert system is based on the Google Earth Engine (GEE) platform, and uses Sentinel-2 satellite images as input data. For continuous monitoring during cloudy and monsoon seasons, this is further integrated with Sentinel-1 Synthetic Aperture Radar (SAR) data.

— "We conducted trials in 2023 before starting the portal. Historical data are used to determine the average reference values for any season and any deviation is flagged by the algorithm by comparisons within the same month. That is how unique patches of deforestation are identified from before-and-after images, and then alerts are sent to states with precise coordinates," a FSI scientist who worked on the portal explained.

— A former FSI official described the portal as "India's answer" to the early warning system used by Latin American countries.

— Terra-I, which is a remote sensing-based deforestation monitoring system funded by Global Forest Watch, feeds unique 250-metre spatial resolution deforestation alerts. The FSI, by comparison, uses satellite imagery at 10-20-metre spatial resolution — Sentinel 2B (optical), Sentinel 1 (SAR 5m), Sentinel 2 (visible and NIR 10m), RedEdge and SWIR 20m.



— The FSI has been playing a key role in fire monitoring since 2004 when satellite data-based alerts on near-real-time detection of active forest fires started.

Do you Know:

— Forest Survey of India defines 'Forest cover' as all lands, more than or equal to one hectare in area, with a tree canopy of more than or equal to 10 per cent, irrespective of ownership and legal status. The FSI, which publishes the biennial India State of Forests Report (ISFR), primarily uses IRS-R2 (ResourceSat-2) LISS-III (Linear Imaging Self-Scanning Sensor-III) satellite data for mapping. The satellite has a spatial resolution of 23.5 m and cannot capture very fine details.

BEHIND AN EARLY SUMMER IS A LACK OF WINTER RAINS

In several regions of India, particularly in the north and west, the cool winter days of February were suddenly replaced by unusually warm days this month. Temperatures were 8 to 13 degrees Celsius above normal, which can be classified as heat-wave conditions. While a similar situation was witnessed in February three years ago, such an early arrival of heat is rare.

Key Takeaways:

— In its March forecast, the IMD said that day temperatures over western Himalayan regions and peninsular and central India would remain 'above' normal. It also warned of 'above' normal heatwave days in Gujarat and Andhra Pradesh. Both scenarios were realised within the very first week of March.

— A state like Himachal Pradesh has already experienced temperatures above 25 degrees Celsius. "The probability of the maximum temperatures over Shimla rising above 25 degrees Celsius is negligible, and definitely not in March. Summer over Shimla peaks in May and early June, but heatwaves are uncommon," said an IMD official.

— A similar situation prevailed in Jammu and Kashmir and Ladakh last week. "The temperatures are quite high and will remain for another 2 to 3 days. The incoming western disturbance will bring down these temperatures," said Mrutyunjay Mohapatra, director general, IMD.

— Western Disturbances are east-moving rain-bearing wind systems that originate beyond Iran, and pick up moisture from the Mediterranean Sea and other water bodies. They are common in winter months.

— The unusual weather can be partially attributed to a relatively dry winter. February was the third driest since 1901 — a direct effect of the lack of favourable weather systems. All-India rainfall in January and February was just 16 mm, or 60% below normal. Both snowfall and rainfall were subdued.

— This was due to a lack of adequate Western disturbances from November 2025. The wind system had caused the bulk of the winter rains. Additionally, meteorologists observed no wind convergence in the westerly and easterly winds, which bring moisture from the seas to central and north India.

— Dry winters are generally associated with an early onset of hot summer days because a lack of rain hastily heats up the soil. When soil is moist, the onset of summer sees some moisture evaporate first, but with little or no rain, the dry land heats faster, raising overall temperatures.



— The immediate impact of the sudden spike in temperatures would be on the standing rabi crops. Mustard, wheat, gram, groundnut, sesame, sorghum, safflower, in addition to vegetables like potato and fruits like apples, will need additional care. Farmers have been advised to deploy frequent irrigation to maintain soil moisture levels. However, this could further stress local water resources.

Do You Know:

— According to the Indian Meteorological Department (IMD)- A heatwave is a period of abnormally high temperatures, more than the normal maximum temperature that occurs during the summer season in the North-Western parts of India.

— Heatwaves typically occur between March and June, and in some rare cases even extend till July. The extreme temperatures and resultant atmospheric conditions adversely affect people living in these regions as they cause physiological stress, sometimes resulting in death.

— A heatwave is declared when the maximum temperature of a station reaches at least 40°C or more for plains, 37°C or more for coastal stations, and at least 30°C or more for hilly regions.

— Based on departure from normal temperatures, the following criteria are used to declare a heatwave:

(i) Heatwave: Departure from normal is 4.5°C to 6.4°C.

(ii) Severe Heatwave: Departure from normal is 6.4°C.

WHAT IS THE STATE OF THE ENVIRONMENT IN INDIA?

The story so far:

On February 25, the Delhi-based Centre for Science and Environment (CSE) released the 'State of India's Environment 2026', a report that the research and advocacy non-profit has been publishing since 1982. The report gives a bird's-eye view of the environmental challenges the country faces, ranging from floods, extreme weather events, changes in tiger behaviour, and air pollution. It also gives a global perspective of climate change and connects it to the Indian context.

Are extreme weather events increasing?

The report says that in 2025, India experienced the highest rise in both the frequency and severity of extreme weather events over the past four years, including heatwaves, cold waves, heavy rainfall, and floods. Data from January 1 to November 30, 2025, show that such events were recorded on 99% of the days in 2025, resulting in 4,419 reported deaths and affecting at least 17.41 million hectares of crop area. This is a sharp rise from 2024, when extreme weather events occurred on 88% of days, causing 3,393 deaths and impacting 3.61 million ha of crop area. In 2023, 89% of days experienced such events, resulting in 3,208 deaths and 2.09 million ha of crop damage.

Himachal Pradesh was the worst hit by extreme weather events (267 days), followed by Kerala (173 days), and Madhya Pradesh (162 days).



Taken together, these trends signal a “widening ecological backlash and underscore the urgency of meaningful climate action. Without decisive efforts to cut risks and emissions, the disasters we face today risk becoming the norm tomorrow,” the report said.

Are floods becoming more intense?

The report talks about how a warming climate will substantially increase the possibility of widespread floods. It says, “Climate change is not a distant possibility; it is already shaping our rivers, our cities, and our lives. Future resilience will depend on how quickly we can integrate climate science into everyday planning — from how we design culverts to how we allocate land along rivers.” It says India’s approach should move from post-disaster relief work to pre-disaster resilience. The report emphasises the need for nature-based solutions such as restoring wetlands, reconnecting rivers to floodplains, recharging groundwater, harvesting rainwater, and restoring and constructing lakes.

Is tiger behaviour changing?

The report notes that there is an increase in tigers killing humans. From January to June 2025, at least 43 people were killed near tiger reserves, with tigers consuming parts of their victims in four cases. In the same period in 2024, 44 people lost their lives to tiger attacks.

Tigers rarely turn into compulsive human-eaters, but tiger attacks and consumption of humans increase when the wild cats grow old or suffer from injuries and are unable to hunt for food, or when their natural prey base disappears. According to experts and wildlife observers, says the report, one of the reasons why tigers seem to be increasingly targeting humans is proximity of humans to tiger territory.

CSE notes that both the tiger population and the number of people living near forests are on the rise. In 20 States with tiger populations, around 40% of tiger territory overlaps with land home to 60 million people. Tiger populations inside reserve areas are at a saturation point. As a result, the big cats are venturing outside protected areas. Experts cited in the report attribute these behavioural changes to overcrowding, habitat loss, and human activity near tiger habitats.

Is India measuring air pollution properly?

As per CSE’s analysis, only 15% of India’s population (about 200 million people) live within 10 kilometres of a continuous air quality monitor. The remaining 85% (more than 1.2 billion people) breathe air that is outside any measurable range. Air quality monitoring remains concentrated in a limited set of large cities, primarily State capitals and metropolitan regions. “Entire districts, industrial belts and fast-growing peri-urban belts remain outside the monitoring grid. The result is a fragmented picture: a few zones with dense, overlapping data coverage and vast regions that appear blank,” it says. This absence is not just a gap in information, but an example of structural inequality in India’s environmental governance. Hundreds of smaller towns, many of which experience comparable or even higher levels of air pollution due to local industrial and transport activities, have no real-time data at all, according to the report.

RESEARCHERS PUBLISH FIRST-OF-ITS-KIND CHECKLIST ON FIREFLIES ACROSS INDIA

Researchers have brought out a first-of-its-kind checklist of fireflies in India by putting together data from more than 260 years of scattered scientific records from 1881 to 2025.



A study published in the Zootaxa journal on March 10 documents 92 species across 27 genera, with more than 60% of them endemic.

According to the authors of the study, many of these species were described in the 1800s and have never been studied again in modern taxonomy, leaving large gaps in understanding the glowing insects. The paper titled 'A checklist of fireflies (Coleoptera: Lampyridae) from India' was authored by Parvez, Akshay Kumar Chakravarthy, Oliver Keller, Devanshu Gupta and Amlan Das.

The researchers note that while there have been attempts to build research on firefly taxonomy, the results have been fragmented so far. Parvez, lead author of the paper, notes that more than 50 species have not been recorded again from India since their original descriptions.

"In light of the lack of accessible resources for the Indian fireflies, a literature survey was taken to produce a modern checklist of species from the subcontinent. This checklist of the Lampyridae of India is presented as a first step to remedy the situation, and to provide researchers with a resource to conduct research on fireflies," reads the study.

The checklist provides names of species, names of scientists who documented them originally and subsequently, years of documentation, and geographies in which the species are found. Fireflies were found in 22 States, including one Union Territory, and it was found that several species occurred across geographies.

According to Parvez, the insufficiency of modern literature on fireflies has been a major stumbling block for researchers who to study the insects.

It took close to three years for the scientists to compile the checklist.

192 BIRD SPECIES RECORDED IN SILENT VALLEY

A comprehensive bird survey conducted in the Silent Valley National Park in Kerala documented 192 bird species, highlighting the remarkable avian diversity of the region. The survey, held from March 6 to 8, covered both the core and buffer zones of the national park.

During the survey, participants recorded rare migratory species such as the Asian house martin and the Western house martin. Around 85 birdwatchers from Kerala and Tamil Nadu took part in the exercise.

Assistant Wildlife Warden V.S. Vishnu, who coordinated the initiative, said this was the first time such an extensive survey had been carried out across the entire national park.

The survey was jointly organised by the Kerala Forest Department and the Malabar Natural History Society (MNHS). The team documented 20 bird species endemic to the Western Ghats, including the Nilgiri laughingthrush, Black-and-orange flycatcher, White-bellied treepie, Nilgiri pipit, White-bellied blue flycatcher and Nilgiri sholakili.

Researchers also recorded evidence of breeding in around 11 species, including the Sri Lanka frogmouth (Mackachikada), Indian nightjar (Rachukk), Bronzed drongo (Lalithakaka), Malabar trogon (Theekaka), Crimson-backed sunbird (Cheruthenkili), Purple-rumped sunbird (Manjathenkili), and Malabar imperial pigeon (Pokana).



Although bird surveys had previously been conducted in different parts of the park, this was the first survey to cover all 21 forest camps, including high-altitude locations such as Poochipara, Koomban, Sispara, Meenbhani and Walakkad.

Among the camps, Anavaayi recorded the highest number of species (95), followed by Thathengalam (94), Uppukandam (93) and Keeripara (92). The survey also noted a healthy diversity of birds of prey, including nocturnal raptors such as owls and nightjars.

BEHIND THE CRUMBLING WALLS OF BIHAR'S BALIRAJGARH FORT, A TALE OF MONUMENTAL NEGLECT

The ruins of Balirajgarh in Madhubani district of Bihar echo with the mooing of cattle and squeaking of pigs. If that sounds odd for a centrally protected historical site, the unmistakable stench of human and animal excreta is enough to force visitors to back off – something that the Archaeological Survey of India (ASI) wouldn't be very proud of.

The monumental neglect by the main agency for protection of cultural heritage in India, which recently granted fresh approval for excavation at the site, has by now become part of the popular lore in Balirajgarh.

The fresh sanction though has rekindled hopes that the buried layers of Mithila's early urban civilisation will finally be explored in depth.

The approval, issued by the ASI on February 26, is valid for a year and authorises the agency's Patna Circle to undertake excavation at the site, officially listed as the 'Remains of Ancient Fort of Garh'. Locally known as 'Raja Bali Ka Garh', the site was first identified in 1884 by George Abraham Grierson, the then Madhubani Sub-Divisional Magistrate.

Three excavations

Located some 35 km from the district headquarters of Madhubani and about 260 km from north of Patna, the site, spread over 122.31 acres, was excavated for the first time in 1962-63. An excavation by the Bihar State Archaeology Directorate in 1972-73 revealed significant historical structural and cultural remains belonging to the Maurya, Sunga, Kushan, Gupta and Pala periods. The last digging was done in 2013-14 by the ASI, but abandoned midway in 2014 with officials citing reasons like "environmental constraints and a high water table making further digging difficult".

Previous attempts

Archaeological findings from earlier digs point to a five-fold cultural sequence at the site, beginning with the Northern Black Polished Ware phase (circa 700–200 BCE) and continuing through the Sunga, Kushan, Gupta and Pala periods. This suggests continuous habitation from early historic to early medieval times.

According to ASI Director General Yaduvir Singh Rawat, the chronology may be the same but with each digging, there are chances of unearthing new layers of cultural fabric of the town. Around 20 trenches are proposed to be dug this time.



JHUMKA, RALPH LAUREN, AND THE DANGLING QUESTION OF PATENTING HERITAGE CRAFTS

When Ralph Lauren models strutted out in a corporate dandy attire at the Paris Fashion Week wearing jhumkas — Indian half-dome earrings in oxidised metal — it didn't matter if they were picked up from the Bareilly bazaar, Delhi's Janpath, or silver jewellers of Jaipur. As the fashion label tagged it as another "authentic vintage accessory" instead of crediting Indian craftsmanship, it seemed a perfunctory nod to heritage and all about cultural misappropriation.

Key Takeaways:

— Despite the continued backlash on social media, this is not the first time a global fashion house has mimicked Indian motifs and crafts and rebranded them as their own. Recently, Prada did it with Kolhapuri chappals till their makers in Maharashtra wrested their credit. Be it the Louis Vuitton auto-rickshaw bag, Gucci's kaftan top inspired by our kurti, Dior's mukaish coat or Dolce and Gabbana's walnut wood bags inspired by Kashmiri jewellery boxes, brands poached a cultural legacy without collaborating or recognising local artisans.

— The jhumka has endured since 300 BC, with origins that can be traced back to ancient temple sculptures and royal adornment across South India and the Deccan. "This was particularly endorsed by the Chola dynasty," says Pratiksha Prashant, CEO of Kishandas & Co, a 150-year-old jewellery house from Hyderabad that recreated Chola-era jewellery for the film *Ponniyin Selvan 2*.

— However, jewellery specialist Preeta Agarwal credits the jhumka's origins to tribal accessorisation. "Rather than a definitive geography, it could have come from our earliest accessories made of cowries and fruit shells. By the time metallurgy developed and reached its pinnacle in the Chola dynasty, bell-shaped earrings became iconic," she says.

— Traditional cultural expressions like jhumkas, bandhani, chikankankari, or kolhapuris often fall into a grey area in intellectual property (IP) law, according to IP lawyer Safir Anand. "Copyright protects original works, not centuries-old designs. Design law protects new designs, not traditional ones. Trademarks protect brands, not cultural motifs. So, heritage sits in a legal vacuum. Culture is valuable, but legally under-protected," says Anand, senior partner and head of Trademarks, Commercial & Contractual IP at Anand and Anand. So, no case can be made out about compensation.

— Since luxury fashion thrives on borrowing aesthetics from around the world, they have been drawing inspirations from the developing world. "That's why Moroccan embroidery, Mexican textiles, native American beadwork, Indian jewellery and craft have become globalised fashion motifs, often stripped of their cultural narrative," he adds.

— Besides, unlike art or academia, fashion has no strong tradition of citation. "That absence of attribution is what fuels cultural appropriation debates. From a policy perspective, heritage gets diluted because craft travels without context. I often say it is de-contextualisation as the design survives but the story does not," says Anand.

— Global brands could adopt a norm similar to museum attribution. This is the scholarly process of determining the creator, origin, date, and authenticity of an artwork or artifact, often establishing it as the work of a specific artist or culture. This costs nothing but is only a cultural



acknowledgement. Brands could co-create with local artisans and validate their originality this way.

— “We must strengthen protection through Geographical Indications (GI) as also craft certification systems. The Government also has a mission focussing on tribal arts, which may go beyond the scope of geography and may focus on community at large. In the same manner, the scope of such a mission could be used for other culturally relevant arts and forms,” says Anand. He even suggests a national heritage law on the lines of the legislation the government is preparing regarding manuscripts.

Do You Know:

— Intellectual property right is the right given to persons over the creations of their minds: inventions, literary and artistic works, and symbols, names and images used in commerce. They usually give the creator an exclusive right over the use of his/her creation for a certain period of time.

— According to the Ministry of Electronics and Information Technology, “Patents is a statutory right granted by the respective governments. It gives one exclusive rights and bars others from making, using, selling and importing a product or process, based on the patented invention without one’s prior permission.”

— Patents encourage investment in drug development by offering 20 years of exclusive market access to its holder to recover their R&D investment.

HOW MANGAL KAVYAS REINVENTED HINDUISM IN BENGAL

Stories shape culture. The Mangal Kavyas is one such example. They are folk narratives that emerged in Bengal between the fifteenth and eighteenth centuries. This was the period after Muslim rule had been established in Bengal, when older Buddhist institutions had declined, Brahmanical Hinduism was struggling to reorganise itself, and Islam was expanding rapidly, especially in eastern Bengal.

In this setting, the Mangal Kavyas became narrative instruments through which Hindu identity was reconstructed in western Bengal, particularly in the Rarh region west of the Bhagirathi river. Rarh was geographically distinct from the fertile alluvial plains of eastern Bengal. It was marked by lateritic soil, forests, marshes, and unstable river channels shaped by the Damodar and other rivers. Until late medieval times, it remained sparsely settled. Hunting, fishing, pastoralism, and shifting cultivation dominated.

Many inhabitants belonged to marginal castes and indigenous communities who worshipped local deities of snakes, disease, forests, fertility, and justice. These were regions neglected by Brahminical elites and actively engaged by Sufi missionaries.

Folk deities in the Mangal Kavyas

The Mangal Kavyas were a creative response. Composed in Bengali by rural Brahmans and performed orally in village settings, they did not centre on classical gods. Instead, they foregrounded folk deities such as Manasa, Chandi, and Dharma. These texts were not merely devotional. They were acts of cultural negotiation, allowing Hinduism to absorb local religious worlds rather than erase them.



The Manasa Mangal illustrates this clearly. Set in the mercantile, riverine world of Bengal, it narrates the conflict between Manasa, goddess of snakes, and Chand Sadagar, a wealthy merchant devoted exclusively to Shiva. Chand's refusal to worship Manasa is portrayed as elite religious arrogance.

Manasa retaliates: ships sink, sons die of snakebite, and the household collapses in grief. The narrative dwells on suffering, especially that of women, culminating in Behula's perilous river journey with her dead husband's body to the divine realm. Only when Chand reluctantly acknowledges Manasa does prosperity return.

Social transition in Chandi Mangal and Dharma Mangal

The Chandi Mangal unfolds in forest frontiers and newly settled agrarian zones. The goddess Chandi elevates Kalakettu, a forest hunter, into kingship, granting him territory and legitimacy. His ascent is turbulent, marked by pride, violence, rebellion, and defeat. Yet the narrative is less about moral correction than about social transition.

It mirrors the historical clearing of forests, agricultural expansion, and the emergence of new political authorities in western Bengal. Chandi, not originally a Puranic deity, becomes a patron of settlement and state formation, embedding popular religious authority within evolving Hindu kingship.

The Dharma Mangal is more overtly political. The deity of Dharma, worshipped largely by 'low' castes, appears in early compositions such as the Shunya Purana as an opponent of Brahmanical dominance. Even Hindu gods take the form of Muslim warriors. These episodes preserve memories of resentment against Brahmanical oppression. This tone corresponds to the initial phase of Muslim rule, when lower castes perceived Islam as a social leveller.

Hindu reorganisation in western Bengal

Later Dharma Mangal texts reverse this orientation. The deity of Dharma is gradually absorbed into Hindu cosmology. His followers align against Muslims. The deity who once mocked Hindu gods becomes their ally. This marks the success of Hindu reorganisation in western Bengal. Folk religion itself is rewritten to sustain Hindu identity.

The flowering of the Mangal tradition coincided with three major developments in Rarh: the Vaishnava movement of Chaitanya in the early sixteenth century, the expansion of settled agriculture, and the consolidation of Mughal authority. Chaitanya's devotional egalitarianism softened caste barriers and created a climate of inclusion. Ecological change allowed forest communities to shift to agriculture, forming new peasant castes seeking ritual legitimacy. The Mangal Kavyas supplied that legitimacy by sacralising their deities, occupations, and aspirations.

The Mangal Kavyas were therefore not peripheral literature. They were instruments of religious strategy shaped by ecology, geography, and social change. Through emotionally charged narratives of humiliation, suffering, negotiation, and reconciliation, they transformed folk deities into Hindu gods, and subaltern worshippers into Hindus. Western Bengal did not remain Hindu by resisting Islam, but by reinventing Hinduism itself.



SHORT NEWS

BEIJING ADOPTS ETHNIC UNITY LAW THAT 'ERODES' MINORITY RIGHTS AND CEMENTS ASSIMILATION

China adopted a sweeping law Thursday to promote what it calls "ethnic unity," a measure that critics say would further erode the rights of some minority groups as authorities cement a push toward assimilation. The law, approved by the country's ceremonial legislature, is designed to foster "a stronger sense of community among all ethnic groups in the Chinese nation," said Lou Qinjian, a delegate to the National People's Congress who introduced the proposal to the whole body. The proposed law lays out the need to promote ethnic unity by all government bodies and private enterprises, including local governments and state-affiliated groups like the All-China Women's Federation.

'GOVT NOD STILL NEEDED FOR ENTITIES REGISTERED IN CHINA, HONG KONG'

A day after the Cabinet cleared the changes to foreign direct investment (FDI) norms related to land bordering countries (LBC), the Department for Promotion of Industry and Internal Trade of India (DPIIT) has clarified that entities "registered" in China and Hong Kong and countries sharing land borders with India will continue to need prior government approval in case they want to invest in India. This relaxation is only for entities in non-LBCs having beneficial owners from LBCs below 10% and with a non-controlling stake, government officials said. The Centre, in its Tuesday decision, defined 'beneficial owner' for investors from land-border sharing countries, in line with money laundering rules. Investors with non-controlling LBC Beneficial Ownership of up to 10% will be permitted under automatic route as per the applicable rules, the Cabinet said.

RELIANCE TO INVEST IN NEW TEXAS REFINERY: TRUMP ANNOUNCES \$300-BN DEAL

US President Donald Trump has announced a new refinery in Brownsville, Texas, thanking India's private sector refining giant Reliance Industries Limited (RIL) for its "tremendous investment" for the project. According to Trump, the Brownsville refinery, the first new refinery in the US in five decades, entails a \$300-billion deal. The refinery will be built by America First Refining, which plans to break ground on the project in the April-June quarter this year. The RIL owns and operates the world's largest single-location refining complex in Gujarat's Jamnagar.

CENTRE ASKS BENGAL TO GIVE REPORT ON PRESIDENT'S VISIT

A day after President Droupadi Murmu expressed disappointment over the Mamata Banerjee government's arrangements for the International Santal Conference in Darjeeling, the Union Home Ministry on Sunday sought a report from the West Bengal Chief Secretary on the alleged violations of protocol laid down in the "Blue Book" and poor security arrangements during the President's visit.

Security arrangements for the President, Vice-President and Prime Minister are made according to guidelines contained in their respective 'Blue Books' issued by the Ministry of Home Affairs and the SPG Act.



According to protocol, the Chief Minister or senior Ministers are expected to receive the President at the airport. However, neither Ms. Banerjee nor any Minister was there to receive Ms. Murmu, who was instead welcomed by Siliguri Mayor Gautam Deb. On Saturday, Ms. Murmu expressed displeasure over the change of venue of the conference and the absence of Ms. Banerjee and her Ministers during her visit.

The West Bengal Assembly election is expected to be held in the next few months.

Responding to the criticism, Ms. Banerjee accused the President of speaking “on the advice of the BJP”, and questioned her “silence” on the alleged atrocities against tribals in Manipur.

HOUSE PANEL SOUNDS ALARM AS URBAN DEVELOPMENT BUDGET HITS FIVE-YEAR LOW

A Parliamentary Standing Committee on Thursday flagged the decreasing share of allocations for the Ministry of Housing and Urban Affairs (MoHUA) to the lowest in five years, at 1.6 per cent of the 2026-2027 Budget Estimates, at a time when urbanisation is increasing. The Standing Committee on Housing and Urban Affairs, chaired by Magunta Sreenivasulu Reddy, presented its report on the Ministry of Housing and Urban Affairs' Demands for Grants (2026-2027) in the Lok Sabha on Thursday.

CENTRE FOR DELINKING WOMEN'S QUOTA FROM CENSUS; EXPLORES LOTTERY FOR POLLS

The Union government is exploring the possibility of delinking the Women's Reservation Act from the delimitation and Census exercises and implementing it before the 2027 Assembly elections in Uttar Pradesh and Uttarakhand, it is learnt. One option that the government was seriously considering is introducing a lottery system to decide the one third of the constituencies that should be reserved for women, sources said. The women's reservation law was passed in a special session in September 2023, months before the Lok Sabha elections. It has a clause that stipulates that reservation for women in the Lok Sabha and state Assemblies will come into effect only after the first Census conducted after the Act's commencement is completed, followed by a delimitation exercise. The Census, initially scheduled to be held in 2021, got delayed because of the Covid-19 pandemic. The process, however, has started and is expected to be completed by 2027.

MHA: STATUTORY BODIES CANNOT SEEK LOOK OUT CIRCULARS DIRECTLY

In a significant modification to its guidelines for Look Out Circulars (LOCs), the Ministry of Home Affairs (MHA) has specified that statutory bodies with no criminal jurisdiction cannot issue direct requests to the Bureau of Immigration to prevent any Indian or foreigner from leaving the country, The Indian Express has learnt. The MHA has underlined that all such requests have to be routed through a law enforcement agency.

AUTO-SETTLEMENT OKAYED BY EPFO: WHAT IS THE STATUS OF INOPERATIVE ACCOUNTS

The Employees' Provident Fund Organisation (EPFO) has a total of 31.83 lakh inoperative accounts, of which around 41% have been inoperative for over 5-10 years while about 22% are lying idle for over 20 years. In its latest (239th) meeting on Monday (March 2), EPFO's Central Board of Trustees decided to address this issue by giving a nod for auto-settlement of such

4TH FLOOR SHATABDI TOWER, SAKCHI, JAMSHEDPUR



inoperative accounts, initially for those with unclaimed balance of Rs 1,000 or less, to their registered bank accounts. Inoperative accounts are those EPF accounts in which no interest is credited after a specified period. Mainly belonging to EPFO members who have retired after the age of 55 years, an EPF account is treated as inoperative if no contribution is received for a continuous period of three years after the member attains 55 years of age or from the date of retirement, whichever is later. If the member is below the age of 55 and there has been no contribution, such EPF accounts continue to earn interest till the age of 58. The Board approved a pilot project for auto-initiation of claim settlement in the inoperative EPFO accounts with unclaimed balances of Rs 1,000 or less. Over 1.33 lakh accounts with nearly Rs 5.68 crore will be covered in this phase, and based on the pilot's results, it is then planned to be extended to accounts with balances above Rs 1,000.

NEARLY A YEAR AFTER TENDER, RS 1,600-CRORE GRAVITATIONAL WAVE OBSERVATORY IN LIMBO

The construction of a major gravitational wave observatory in Maharashtra's Hingoli district, one of the country's biggest science projects, remains in limbo with the Rs 1,600-crore work tender floated in April last year yet to be awarded, according to records accessed by The Indian Express under the RTI Act. The showpiece Laser Interferometer Gravitational Wave Observatory (LIGO) is designed to work in sync with two similar facilities in the United States which, in 2015, detected gravitational waves for the first time — exactly 100 years after their existence was predicted in Albert Einstein's Theory of General Relativity. The ability to detect gravitational waves gives scientists a new vision to track cosmic events that light or other electromagnetic waves are not able to capture.

NOTICE PERSONAL DETAILS SHOWING UP IN GOOGLE SEARCH? 'RESULTS ABOUT YOU' TOOL CAN HELP

As people leave behind larger digital footprints, personal information such as phone numbers, addresses and email IDs can often appear in search results. To address privacy concerns, Google introduced a feature called 'Results About You,' which helps individuals find and request the removal of certain personal details from its search results. The tool, launched in 2022 and expanded since then, is part of the company's broader push to give users greater control over their online presence. Google says the tool is part of a wider set of privacy features designed to help people manage their digital footprint. While the feature does not erase personal information from the internet, it offers users a mechanism to manage how their data appears on one of the world's most widely used search engines.

STUDY: RS 54K EXPENSES PER HOSPITALISATION IN PVT FACILITIES UNDER PMJAY

Patients accessing private facilities under Pradhan Mantri Jan Arogya Yojana (PMJAY) had to incur on an average Rs 53,965 Out-of-Pocket Expenditure (OOPE) per hospitalisation on medicine, transport and diagnostics services, reveals an evaluation study commissioned by the NITI Aayog. The PMJAY, which is a flagship scheme under the Centre's Ayushman Bharat scheme, was launched on September 23, 2018 with a total outlay of Rs 40,112 crore for a period of five years 2019-20 to 2024-25. The scheme is touted as the "world's largest" health assurance scheme, aimed to provide health coverage of Rs 5 lakh per family per year for secondary and tertiary care hospitalisation. The government's target is to cover over 12 crores families (about 55 crore



individuals) under this scheme. The scheme provides cashless health services related to 1,961 procedures across 27 medical specialities. In September 2024, the PMJAY was expanded to cover all senior citizens aged 70 and above, irrespective of their socio-economic status.

NEED COVID-LIKE EXEMPTIONS, PHARMA INDUSTRY URGES MINISTRIES AMID FUEL CURBS

The curbs on supply of LPG and petrochemicals in view of the ongoing West Asia conflict have impacted the pharmaceutical and medical device industry, affecting the manufacturing of even the most common medicines like paracetamol and products such as gloves and syringes.

Industry bodies and think tanks have written to the Commerce Ministry, Petroleum and Natural Gas Ministry and the department of pharmaceuticals under the Ministry of Chemicals and Fertilisers, seeking exemptions such as the ones seen during the Covid pandemic — allowing manufacturing to continue considering them to be essential commodities. The government on Monday invoked the Essential Commodities Act to divert natural gas to “priority sectors”. Essential commodities as defined by the Act include cattle fodder, coal, its derivatives, automobile components and accessories, cotton and wool textiles, drugs as defined in Section 3 of the Drugs and Cosmetics Act, foodstuffs, iron and steel, raw cotton, raw jute and any other product listed by the Centre via a notified order.

K.N. PANIKKAR, RENOWNED HISTORIAN, ACADEMIC AND PUBLIC INTELLECTUAL, PASSES AWAY AT 89

Eminent historian, academic, and public intellectual K.N. Panikkar, widely regarded as one of India’s foremost scholars of modern history, passed away in Thiruvananthapuram on Monday. He was 89.

Kandiyoor Narayana Panikkar, popularly known as K.N. Panikkar, was born to Krishnan Nair and Ichkutty Amma in Thaikkad near Guruvayur in 1936. He had a distinguished academic career. After teaching in institutions, including the University of Rajasthan, Hansraj College (Delhi University), and the Indian Institute of Public Administration, he joined Jawaharlal Nehru University (JNU) in 1972.

At the JNU, he served as Professor of History, Head of the Centre for Historical Studies, and later Dean of the School of Social Sciences. He had also served as visiting Professor and fellow at several international universities. Beyond teaching, Professor Panikkar held important academic and institutional roles.

He served as Vice-Chancellor of Sree Sankaracharya University of Sanskrit, and later the first Vice-Chairperson of the Kerala State Higher Education Council. He was also the founding Chairperson of the Kerala Council for Historical Research (KCHR).

Professor Panikkar authored numerous influential books and essays on colonialism, culture, religion, peasant movements, and historiography. His work on the Malabar region, colonial power structures, and peasant uprisings remains widely cited in modern Indian historiography. The seminal work *Against Lord and State: Religion and Peasant Uprisings in Malabar (1836-1921)*, which examined the rebellion as a peasant uprising against landlordism and colonial power, had generated extensive scholarly debate and remains one of the most discussed interpretations of the event.



DreamIAS



BUSINESS AND ECONOMY

AI'S IMPACT ON LABOUR MARKET: ANTHROPIC'S REPORT FLAGS 'HIGH EXPOSURE' JOBS

Anthropic has just come out with a rigorous labour market study in Artificial Intelligence (AI), which introduces a new measure for understanding the labour market effects of AI and studies impacts on unemployment and hiring. Jobs are more exposed to AI to the extent that their tasks are theoretically feasible with LLMs, with computer programmers, customer service representatives, and financial analysts cited as among “the most exposed”.

Key Takeaways:

— Even though the current usage of AI is limited in some sectors, Anthropic found that AI can theoretically cover a majority of tasks in sectors like business and finance, management, computer science, math, engineering, legal, and office administration roles.

— In contrast, the company said that sectors like construction, agriculture, protective services, and personal care, among others, may have a limited theoretical use of AI, and therefore, jobs in these sectors could be more insulated from the impact of AI than some others.

— This finding shows one key thing: that even though AI is theoretically capable of doing almost all tasks in some sectors, its current usage is limited. For instance, for computer and math workers, large language models are theoretically capable of handling 94% of their tasks. But Claude currently only covers 33% of those tasks in observed professional use.

— The researchers combined three data sources to build a picture of which jobs are most at risk:

— First, they used the US government's occupational database to map out every task associated with around 800 jobs. Second, they juxtaposed it with existing academic measures of which tasks AI could theoretically speed up significantly. Third, and most importantly, they cross-referenced this against real Claude usage data to see which tasks people are actually using AI for in professional settings today, weighting fully automated use more heavily than assisted use.

— The result is a measure they call “observed exposure”: not just what AI could theoretically do, but what it is demonstrably already doing at work. They then tested this measure against US government employment projections and unemployment survey data to see whether higher exposure correlates with weaker job growth and rising unemployment.

— Already, hiring of younger workers into the so-called exposed roles has dropped sharply since ChatGPT launched. Entry into high-exposure occupations among workers aged 22 to 25 has fallen 14% since late 2022. Even as companies are not laying people off, they are closing the front door for new hires.

— The data also shows how some demographics can be more at risk than others. Workers in the most AI-exposed professions differ significantly from those in unexposed roles. The data indicates that highly exposed workers are more likely to be are: Female, Highly educated, White or Asian, Older.

— Though Anthropic's analysis extensively analyses data from the United States, AI is already making a huge wave in the Indian market, posing a big risk to some of the country's most crucial industries. Broadly, lack of mathematical and scientific skills in a large part of the country's



population further add to the problem, which is compounded by low spends on education, research and development compared with rivals like the US and China.

— For Indian IT companies, the implications are particularly acute. Their business model has long depended on providing services—data processing, contract analysis, compliance monitoring, customer support—that AI tools can now potentially automate. Anthropic’s announcement includes specialised tools for legal workflows such as contract review, NDA analysis, and compliance monitoring, as well as applications in finance, sales, and data analytics.

— While it may not be a complete doomsday for the sector, at least not yet, the recent price corrections have led to calls for the sector to evolve quickly to adapt to the AI world.

Do You Know:

— Artificial Intelligence is the ability of machines, especially computers, to perform tasks that typically require human intelligence. These tasks include things like understanding language, recognising patterns, solving problems, and making decisions.

WHY DID U.S. SC REJECT TRUMP’S TARIFFS?

The story so far:

On February 20, the U.S. Supreme Court delivered a decision that could reshape the legal boundaries of presidential trade power. The court held that the International Emergency Economic Powers Act (IEEPA), which U.S. President Donald Trump relied on, does not authorise a President to impose tariffs. It struck down the sweeping reciprocal and drug-trafficking-related tariffs imposed by Mr. Trump in 2025, calling them unconstitutional.

What authority did Trump rely on?

So far, Mr. Trump has used the IEEPA, a 1977 law that allows the President to regulate certain economic transactions after declaring a national emergency to address an “unusual and extraordinary threat” originating outside the country.

IEEPA emerged out of the Trading with the Enemy Act, which was passed in 1917 when the U.S. entered the First World War, to regulate trade with enemy nations. It has been used to freeze foreign assets held in American banks, block financial transfers, and impose sanctions on hostile governments and terrorist groups. However, before 2025, it was never used to impose tariffs.

After returning to office for his second term, Mr. Trump declared national emergencies tied to drug trafficking from Latin American countries and trade imbalances. His administration imposed 25% tariffs on most goods from its neighbours, Canada and Mexico, 10% tariffs on most goods from China, and a separate reciprocal tariff programme imposing at least a 10% duty on imports from virtually all trading partners. Some countries, including India, were hit with even higher rates.

Why did the Supreme Court strike the tariffs down?

The U.S. Constitution gives Congress the power “to lay and collect taxes, duties, imposts and excises.” Congress also has the power to regulate trade with foreign countries, and tariffs fall squarely within that authority.



The court concluded in a 6-3 ruling that the IEEPA does not authorise the President to impose tariffs. Chief Justice John Roberts, in his opinion, cited a hodgepodge of tariffs announced by Mr. Trump.

“The President asserts the extraordinary power to unilaterally impose tariffs of unlimited amount, duration, and scope,” Justice Roberts wrote in his opinion. “In light of the breadth, history, and constitutional context of that asserted authority, he must identify clear congressional authorisation to exercise it.”

Does this mean Trump can no longer impose tariffs?

No. The decision only forbids the use of IEEPA, but Mr. Trump was quick to announce a workaround. Shortly after the Supreme Court ruling, his administration announced a new temporary import duty, which went into effect on February 24 for a period of 150 days.

“We will get back to the same tariff level for the countries. It will just be in a less direct and slightly more convoluted manner,” U.S. Treasury Secretary Scott Bessent said after the Supreme Court ruling.

Mr. Trump alluded to using Sections 122, 301, and 232 to levy tariffs.

Section 122 is part of the Trade Act of 1974. It permits the U.S. President to impose tariffs of up to 15% on a country to address “a large and serious United States balance-of-payments deficit.” The tariff can be applied for a maximum of 150 days unless extended by Congress.

Section 301 of the U.S. Trade Act of 1974 allows tariffs to be imposed if the government finds that a trading partner has engaged in what it deems unfair trade practices.

Section 232 is part of the U.S. Trade Expansion Act of 1962. These tariffs are levied on specific sectors if the Secretary of Commerce deems them necessary on national security grounds.

What role does Congress now play?

Congress sits at the centre of tariff authority for two reasons.

The Constitution assigns it the taxing power, and in its ruling, the court leaned heavily on this allocation while interpreting the IEEPA.

Congress determines the scope of executive trade authority through statute. It has the power to narrow existing delegations, require its approval for tariffs, or even expand presidential powers if it chooses to.

Politically, redesigning tariff authority would require bipartisan agreement, especially since the court has made clear that sweeping tariffs must rest on a clear legislative footing.

Will businesses that lost money to tariffs get refunds?

For months, American businesses and customers bore the brunt of the heightened tariffs. The court ruling, while rendering the tariffs illegal, has not created a mechanism for a refund.

According to a Goldman Sachs report, \$180 billion was collected through the now-invalidated tariffs.



More than 1,000 companies, including big names like FedEx, have sued the U.S. government in the U.S. Court of International Trade seeking refunds for the tariffs.

The suit is seeking compensation for potentially millions of shippers who paid import duties and related fees on products that should have entered the U.S. duty-free, Reuters reported.

Does the court decision limit future Presidents?

The ruling draws a clearer statutory boundary.

Future Presidents will retain the authority to regulate trade, as Mr. Trump does, but courts rely heavily on precedents. As a result, it may scrutinise attempts to use emergency powers beyond their intended scope.

HOW DOES CANADA'S URANIUM DEAL HELP INDIA?

The story so far:

In its quest for energy security, on March 2, India signed a Canadian \$2.6-billion deal with Cameco. The Canadian company is among the world's top three largest uranium producers by volume. The deal ensures a supply of around 10,000 tonnes of uranium between 2027 and 2035 to India.

What uranium 'stocks' does India have?

India has both domestic reserves and imported stockpiles of uranium. The domestic reserves amount to 4.2-4.3 lakh tonnes of ore, spread across the major mines of Jaduguda and Turamdih in Jharkhand and Tummalapalle in Andhra Pradesh. The quantum of extractable uranium metal from the ore is estimated to be 76,000-92,000 tonnes.

The order of magnitude difference between the ore and the metal is because Indian ore is 'low grade' (0.02-0.45% concentration). On the other hand, Canada has high-grade ore (10-100 times richer than Indian ore).

India has increasingly relied on imports, which currently meet nearly three-fourths of the civilian requirement. Aside from the Cameco deal, India also finalised a supply agreement with Kazatomprom of Kazakhstan in February, and has ongoing contracts with Uzbekistan and Russia (both with low-grade ore). The government is also building a reserve intended to hold five years' supply of fuel to protect against supply chain shocks. While importing uranium ore is cheaper than extracting it, it cannot legally be used in nuclear weapons. This is why India also mines ore domestically.

Does the deal involve the 2010 agreement?

The deal with Cameco comes under the India-Canada Civil Nuclear Cooperation Agreement (NCA). This was signed in 2010, two years after the Nuclear Suppliers Group issued its 'clean' waiver for India, allowing it to engage in civil nuclear trade despite not signing the Nuclear Non-Proliferation Treaty. The waiver, in turn, was made possible by the 123 nuclear agreement between India and the U.S.

Unlike the deal with Kazakhstan (which is less intrusive), the NCA requires India to provide "fissionable material accounts" to Canada, which critics have often called a slight against Indian sovereignty. On the flip side, the NCA has also been criticised for tacitly supporting India's nuclear



weapons programme: the more uranium India imports for civilian use, the more domestic uranium it can vouchsafe for military use.

How does India use its uranium?

India currently operates 24 nuclear reactors with a generation capacity of around 9 GW. The 700-MW pressurised heavy water reactors (PHWRs) that currently provide 6-7 GW, or roughly 3%, of India's total electricity use uranium as fuel. The government is committed to increasing nuclear power capacity to 100 GW by 2047. Previous attempts to up this contribution have been set back by issues with land acquisition and local protests, however.

Significant amounts of uranium are also used in research reactors, such as Dhruva in Trombay, to produce medical isotopes such as technetium-99m and iodine-131 and for advanced materials science research.

In the 2025-26 Union Budget, Finance Minister Nirmala Sitharaman allocated ₹20,000 crore to develop a new generation of small modular reactors, which typically use 3-5% enriched uranium.

Domestic uranium is also used for nuclear warheads (currently estimated to number around 170) and the nuclear-powered INS Arihant class submarines.

How is India's nuclear power programme faring?

India is currently transitioning from Stage 1 to 2 of the three-stage programme. In Stage 1, PHWRs will use natural uranium-235 to produce electricity and plutonium-239 as a byproduct. In Stage 2, fast breeder reactors will use a mixed oxide fuel of uranium-238 and plutonium-239 to produce electricity, uranium-233, and more plutonium-239. (The reactors are called so because they will produce more fuel than they consume.) The prototype fast breeder reactor (PFBR) in Kalpakkam is currently in an advanced stage of commissioning. Finally, advanced heavy water reactors will use plutonium-239 and thorium-232 as fuel, producing electricity and uranium-233. Homi J. Bhabha envisioned this three-stage programme to take advantage of the fact that India hosts 20-25% of the world's thorium deposits.

However, the programme has been beset by numerous delays and cost overruns. The fast breeder test reactor was built at Kalpakkam in 1977 but the government did not sign off on the PFBR until the early 2000s, thanks in part to sanctions against India over its nuclear tests. The PFBR's cost also nearly doubled from ₹3,492 crore at the time it was designed to more than ₹6,800 crore in 2019.

In March 2013, the Department of Atomic Energy had said in a reply in the Lok Sabha, "The time of large-scale thorium deployment is expected to be 3-4 decades after the commercial operation of fast breeder reactors with short doubling time." Given the PFBR's own timeline, this period could be in the 2060s, if not later.

Former Department of Atomic Energy Chairman Anil Kakodkar has explained that the doubling time — the time taken for one fast breeder reactor to produce enough fuel to start a second — is 15-20 years. To generate 100 GW, then, India has to go through several doubling cycles, which could explain the multiple deals now to secure the supply of uranium.



POLICY MISSTEPS

The events unfolding in West Asia have shone a spotlight not only on India's energy security, but also on its policy preparedness and communication strategy in times of crisis. With India importing close to 90% of its oil needs, it is natural that any disruption to supply chains would hit it hard. The Strait of Hormuz is particularly vital in the supply chain. To the government's credit, it has been gradually trying to reduce India's oil import dependence. The push for ethanol and biofuels is a step in this direction. Smoothing their adoption should continue to be a policy priority in the near term. That said, India's dependence on imported oil remains vast and growing, with the economy expanding by 6%-8% every year. Therefore, measures such as ethanol or biofuel-blending are only likely to be of marginal strategic significance. The policies on importing oil need to become more long-term oriented and robust in the face of external pressure. The crisis in West Asia has shown India just how important supplies from Russia are, at a time when New Delhi had been cutting Russian oil imports due to American pressure. In the past, the government had given in to U.S. pressure over Iranian and Venezuelan oil. The U.S. is now encouraging India to import Russian oil again to steady global markets. The U.S.'s 50% tariffs were hard to bear, but India knew that the U.S. Supreme Court was deliberating on the issue, and, so, could have waited a month for its order. As things stand, India may no longer receive a discount for Russian oil, it has squandered Moscow's trust, respect from the U.S. is diminishing, and a trade deal with it remains distant.

Government officials have made anonymous statements saying that fuel prices will not be hiked in response to higher oil prices. This is as much a political necessity as a moral one. After all, fuel prices were not cut over the last two and a half years even when oil prices were comfortably low. The Pradhan Mantri Ujjwala Yojana (PMUY), providing LPG connections to households, has also laid bare how policy does not anticipate crises. Households have benefited from the PMUY, but the resultant increase in LPG demand — without a commensurate increase in stable supplies and reserves — has meant that restaurants and hotels are now suffering amid shortages. Finally, the policy of the government to so far communicate only through off-record briefings and occasional tweets has meant panic over fuel availability has spread faster than warranted. Tuesday's inter-ministerial press conference came days late and no questions were taken. Clear, accountable communication was needed, yet missing. The government's crisis communication needs more work.

LNG IMPORTS HIT, ESSENTIAL COMMODITIES ACT INVOKED, GAS ALLOCATION PRIORITISED

With liquefied natural gas (LNG) supplies to India hit due to effective halt in shipments through the Strait of Hormuz amid the West Asia conflict, the government has invoked the Essential Commodities Act to divert natural gas to "priority sectors" that are dependent on the fuel.

Key Takeaways:

— According to the order, issued by the Ministry of Petroleum and Natural Gas (MoPNG), segments that directly impact millions of common consumers—piped natural gas (PNG) for households, compressed natural gas (CNG) for vehicles, and liquefied petroleum gas (LPG) production—will have precedence over other natural gas-consuming sectors.



— According to sources in the government, the order has been issued for supply management given the shortage in LNG supplies from West Asia; the shortage needs to be transferred to some non-priority sectors while diverting gas supplies to high-priority sectors.

— Apart from domestic gas and imported LNG, the natural gas required to meet the demand of these priority sectors will be met “through full or partial curtailment” of gas supplied to some petrochemical manufacturing units, gas-based power plants, and consumers of domestic gas produced from difficult blocks. Natural gas supplies to refineries has been cut to 65% of their average consumption of the past six months.

— The MoPNG order lists four priority categories that shall receive, subject to availability, natural gas in varying quantities based on their average gas consumption levels of the past six months. The top priority category, which will receive 100% of the average gas consumption of the last six months, include domestic PNG, or gas supplied to households, CNG for transportation sector, natural gas used for LPG production, and gas consumed for essential pipeline operations. Apart from being produced from crude oil, LPG is also extracted from natural gas. The second priority category, according to the order, is fertiliser units, which will receive 70% of their average gas consumption of the past six months.

— The third category includes “tea industries, manufacturing and other industrial consumers supplied through the national gas grid”, for which supply will be maintained at 80% of their six-month average consumption. In the fourth category are commercial and industrial consumers of city gas distribution companies; they will get 80% of their past six-months average gas use. Public sector gas major GAIL will be managing the supplies of natural gas for the purpose of this order.

— India depends on LNG imports to meet around half of its natural gas requirement of around 190 million standard cubic metres per day (mscmd), and over 50% of those LNG imports come from countries like Qatar and the UAE through the critical chokepoint of Strait of Hormuz, where maritime traffic has been effectively stopped for 10 days now. According to industry estimates, volumes coming via the Strait account for roughly 30% of India’s overall gas consumption.

— The crisis has hit LNG supplies to India, prompting the government to take emergency measures to ensure continuous supplies to sectors that need them the most. Indian oil and gas companies are also scouting for LNG and LPG cargoes from the spot market and have managed to secure some cargoes, sources indicated.

— LNG and LPG from other source markets continue to come in. In LPG, India’s reliance on West Asia is even more acute; the country depends on imports to meet around 60% of its LPG requirement, over 80% of which comes through the Strait of Hormuz.

— With Iran warning vessels to not transit through the Strait of Hormuz, and even hitting a few vessels that were passing through the waterway, there is an effective halt in maritime traffic through the Strait with most trading houses, insurers, and vessels loath to get involved in the prevailing extremely high-risk environment.

— The Strait of Hormuz—the narrow waterway between Iran and Oman that connects the Persian Gulf with the Gulf of Oman and the Arabian Sea—handles approximately one-fifth of global liquid petroleum consumption and global liquefied natural gas (LNG) trade.

— Amid the conflict in West Asia, LPG stocks in India are relatively lower than oil, petrol, and diesel—which are estimated to be sufficient for six-eight weeks—and alternative suppliers are in



faraway geographies like North America. The government has taken measures to ensure uninterrupted supplies to households. The minimum waiting period for booking a domestic LPG cylinder refill increased from 21 days to 25 days to prevent hoarding and creation of artificial scarcity in the market.

— As the conflict in West Asia pushes up energy and commodity prices, its ripple effects are beginning to spread far beyond oil and gas, with sectors such as textiles, mining and steelmaking in India starting to feel the pressure. The impact is emerging through a chain of second- and third-order effects linked to fuel costs, petrochemicals, feedstock, chemicals, and disruptions in global shipping routes along the Strait of Hormuz.

— A senior industry executive said there is impact across industries. “There are three types of impact. One is raw material supply, which is a shortage in imported raw materials, increase in shipping containers, etc. Second is market impact. After the European Union imposed restrictions like CBAM, a lot of industries started looking to West Asia as a market. That is getting impacted. And third is fuel and feedstock supplies which are related to natural gas and LPG supply,” the industry executive said.

— The textile sector, for instance, is experiencing a complex chain of cost increases across its supply network. Textile processing costs have already risen in the short term due to higher energy prices. Processing activities such as dyeing, bleaching and finishing are energy-intensive, and higher fuel and power costs are beginning to push up operational expenses for manufacturers.

— The effect is also visible in fibres such as polyester, one of the most widely used synthetic fibres in the textile industry. Polyester prices have already risen by around 15% he said, with a further possibility of further increases as it is derived from petrochemical feedstock.

— Steelmakers are also facing cost pressures due to disruptions in the supply of coking coal, a key raw material used in blast furnace-based steel production. Shipment disruptions linked to tensions and uncertainty in global trade routes have led to a surge in coking coal prices, adding to the input costs for steel producers.

— Notably, India’s imports of coking coal have been steadily rising, increasing from 51.20 million tonnes (mt) in 2020–21 to 57.58 mt in 2024–25. Around 95% of the steel sector’s coking coal requirement is met through imports, making the industry highly exposed to global supply disruptions.

WHY IRAN WAR THREATENS INDIA’S FERTILISERS SUPPLY

The war in West Asia is not just roiling global oil and gas markets. The tensions are threatening to disrupt the flow of key industrial inputs from the region for several core Indian industries.

Key Takeaways:

— Sectors such as steel, fertilizers, cement and power transmission depend heavily on imports of essential raw materials from West Asia. These essential industrial inputs include limestone, sulphur, gypsum, direct reduced iron (DRI) and copper wires. Notably, more than half of India’s imports of these commodities had originated in the region.



— The West Asia region broadly includes the six Gulf Cooperation Council (GCC) countries — Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and the UAE — along with other regional economies such as Iran, Iraq, Israel, Jordan, Lebanon, Syria and Yemen.

— With the conflict continuing in the region, and missile and drone strikes hitting several energy and logistics facilities across the Gulf, fears of supply disruptions have intensified. The possibility of a closure of the Strait of Hormuz — one of the world's most critical energy and trade routes — has heightened concerns of a global energy supply shock.

— For India, the region remains a crucial supplier of both energy and industrial inputs. As a major supplier of oil and gas to the world, any turbulence in West Asia tends to make global energy markets immediately vulnerable. India is no exception.

— The impact of the war is already being felt. With crude oil stockpiles estimated to last only about a month, Indian refiners have begun increasing purchases of discounted Russian oil.

— The fallout, however, may not remain confined to the energy sector if disruptions to shipping through the Strait of Hormuz continue for more than a week.

— According to the GTRI report, the effect could be felt in fertilizer supplies, manufacturing inputs, construction materials and export industries such as diamonds.

— The construction sector, which depends on mineral imports from the region, could be among the sectors that feel the impact if the conflict persists. The GTRI report estimated that India imported \$483 million worth of limestone from West Asia, accounting for 68.5% of its total imports, and \$129 million worth of gypsum, representing 62.1% of imports.

— Both minerals are crucial for the construction ecosystem. Limestone is a key input for cement production, while gypsum is widely used in cement and other construction materials. Any disruption in supplies could push up cement prices and delay infrastructure projects.

— There are other minerals too that are critical for the fertilizer and steel industries.

India imported \$420 million worth of sulphur from West Asia, accounting for 65.8% of its imports. Sulphur is used to produce sulphuric acid, an essential input for fertilizers and several chemical industries.

— Similarly, India imported \$190 million worth of direct reduced iron (DRI) from the region, representing 59.1% of its imports. DRI is a key input used in steelmaking.

— India also imported \$869 million worth of copper wire from West Asia, accounting for 50.7 per cent of its total imports of the commodity. Copper wire is a critical component in power transmission networks, electrical equipment and renewable energy infrastructure, making the sector vulnerable to any disruption in supplies from the region.

— The conflict could also impact India's diamond processing industry. The country imports over 40 per cent of its rough diamonds from West Asia, which are then processed in India's diamond cutting and polishing hubs — particularly Surat in Gujarat — before being exported as polished diamonds to global markets.

— The steel industry in India also relies on gas as part of its decarbonisation efforts, making it vulnerable to fluctuations in global gas markets.

**Do You Know:**

— The Strait of Hormuz—the narrow waterway between Iran and Oman that connects the Persian Gulf with the Gulf of Oman and the Arabian Sea—is seen as the most important oil transit chokepoint globally, handling approximately one-fifth of global liquid petroleum consumption and global liquefied natural gas (LNG) trade.

INDIA'S NEXT EXPORT FRONTIER: WHY THE COUNTRY SHOULD START SHIPPING TRAINS TO VARIOUS COUNTRIES

India today manufactures almost every type of railway rolling stock — locomotives, coaches, wagons, metro cars and modern trainsets — in large numbers and at competitive cost. Over decades, the railway manufacturing ecosystem has matured through dedicated Production Units of Indian Railways, PSUs and a large vendor base. Yet, despite this capacity and experience, India remains largely absent from the global market for railway vehicles.

This paradox deserves attention. At a time when the country is aiming to expand its manufacturing exports and position itself as a reliable industrial partner for developing economies, Railway Rolling stocks present a major untapped opportunity.

Across Asia, Africa and Latin America, countries are rapidly expanding rail networks to address urbanisation, energy security and congestion. Many of these nations face the same constraints India faced in earlier decades- limited capital, difficult climatic conditions, heavy passenger loads and mixed-traffic operations. They require reliable and economical solutions rather than the most technologically extravagant ones. This is precisely the segment where India's experience is most relevant.

Historically, the global railway supply industry has been dominated by a small group of large multinational corporations. Their products are technologically sophisticated but often expensive and maintenance-intensive. For high-income markets this model works well, but for developing and middle-income countries the lifecycle cost and not the purchase price becomes the decisive factor. A train that is cheaper to operate and easier to maintain over 30 years can be more valuable than a more advanced train that requires complex support systems.

India's railway equipment has evolved under demanding operating conditions- high utilisation, temperature extremes, dust, overloading and diverse track quality. Designs have therefore prioritised robustness, maintainability and operating economy. These characteristics match the needs of emerging railway networks worldwide. In other words, India's rolling stock is naturally suited to the "Global South" market segment.

However, exporting trains is fundamentally different from manufacturing them for domestic use. International railway procurement does not depend solely on engineering capability. It depends on certification, lifecycle support and long-term institutional confidence. Countries buying trains are effectively entering a 25-35 year relationship with the supplier. The purchase becomes not just a commercial transaction but an infrastructure partnership.

Global tech standards

The first requirement is alignment with globally recognised technical standards. International tenders generally require compliance with European or international railway safety norms covering structural strength, fire safety and crashworthiness. Indian manufacturers already



possess strong engineering competence, but certification to globally recognised standards must become routine rather than occasional. Establishing dedicated certification cells in Quality department to routinely produce Rolling Stocks for international qualification would remove the most common barrier to entry.

The second requirement is appealing aesthetic, ergonomic and user interface facilities designed on sound product development principles. All the touch points of user experience should not only be robust and durable but also providing a comfortable journey experience. The global customer is very discerning in this respect. For this, there is a need to establish exclusive Industrial Design Units in the design departments.

The third requirement is life cycle responsibility. Successful exporters do not merely supply trains; they guarantee performance for decades. This includes after sales support for maintenance, training, spare-parts, remote diagnostics and reliability monitoring. For many countries, assurance of long-term service availability is more important than the train itself. Indian manufacturers must therefore expand from a manufacturing mindset to a service mindset — selling availability rather than hardware.

Another element is coordinated institutional participation. In international infrastructure contracts, engineering capability alone rarely secures orders. Financing arrangements, government cooperation and project management integration often determine outcomes. India already has a strong advantage in this respect through its experience in development partnerships and lines of credit to partner nations. When manufacturing capability is combined with project consultancy and financing support, the offering becomes significantly more attractive.

Equally important is building an export oriented supply chain. Railway vehicles are assemblies of many specialised systems - braking, control electronics, doors, passenger information and air-conditioning. A coordinated vendor ecosystem capable of supporting overseas projects can ensure reliability and faster response. Export success depends not on a single factory but on an integrated industrial network.

Strategic dimension

There is also a strategic dimension. Railway exports can become an instrument of economic diplomacy. Many developing countries prefer partners who offer technology sharing and training rather than simple equipment supply. India's long experience in operating and maintaining large public transport networks makes it uniquely positioned to provide this collaborative model. Offering training programs and technical cooperation alongside equipment supply strengthens long-term partnerships.

The global market is increasingly shifting toward suppliers who provide complete mobility solutions rather than standalone products. A train is now expected to come with maintenance planning, digital monitoring and workforce training. By embracing this approach, India can position itself not as a low-cost alternative but as a dependable long-term partner for railway development.

The opportunity is timely. Many countries are planning rail expansion as part of sustainable transport and climate commitments. Electrified railways are among the most energy-efficient transport modes, and demand for affordable systems is likely to grow significantly over the next two decades. Entering this market now would allow India to build presence while demand is expanding rather than after it stabilises.



For India's manufacturing ambitions, railway exports offer advantages beyond revenue. They stimulate domestic industry, encourage standardisation, improve quality practices and enhance global credibility. Success in this sector would demonstrate that the country can deliver complex engineering systems internationally — an important signal for other infrastructure exports.

The path forward is therefore clear. India must move from building trains only for itself to building trains for partners. This requires designing for international certification, user experience, committing to lifecycle service, integrating consultancy and financing support and promoting coordinated industrial participation.

If approached systematically, Railway Rolling stock could become one of India's signature engineering exports — much like pharmaceuticals or information technology services in earlier decades. The capability already exists; what remains is the decision to treat trains not merely as domestic infrastructure but as a global opportunity.

GOVT EASES CURBS TO ALLOW LIMITED FDI FROM CHINA, OTHERS SHARING LAND BORDER

In a move which will allow limited investment flows from China into key manufacturing sectors, the Union Cabinet on Tuesday approved easing of curbs for land-border sharing countries for capital goods, electronic capital goods, electronic components, polysilicon and ingot-wafer for solar cells. However, the investment restrictions for land-border-sharing countries, which were brought into force through the Press Note 3 or PN3 of 2020, have been retained for strategic sectors such as semiconductors, government sources said.

Key Takeaways:

— The government in its Tuesday's decision has also decided a threshold level of 10% for automatic approval of the investment into these sectors. Under the revised investment norms, the majority shareholding and control of the investee entity will be with resident Indian citizen(s) and/or resident Indian entity(ies) owned and controlled by resident Indian citizen(s), at all times, an official release of the Cabinet decision stated.

— The government has set a 60-day deadline for processing and deciding investment proposals from the land bordering countries in the specified manufacturing sectors. A Committee of Secretaries (CoS) under the Cabinet Secretary has been given powers to revise the list of specified sectors going ahead.

— The government has also incorporated the definition and criteria for 'beneficial owner' for investors from land-border sharing countries, in line with money laundering rules. "The Beneficial Ownership test shall be applied at the level of the investor entity.

— Investors with non-controlling LBC (land bordering countries) Beneficial Ownership of up to 10 per cent shall be permitted under the automatic route as per the applicable sectoral caps, entry routes, attendant conditions. Such investments shall be subject to the reporting of relevant information/details by the investee entity to DPIIT (Department for Promotion of Industry and Internal Trade)," the release said.

— The new guidelines are expected to provide clarity and ease of doing business in India, and facilitate investments which can contribute towards greater FDI inflows, access to new



technologies, domestic value addition, expansion of domestic firms and integration with the global supply chain, the release said.

— This comes after a high-level committee chaired by NITI Aayog member Rajiv Gauba had recommended withdrawing curbs on Chinese investments. Separately, the Economic Survey 2023-24 had made the case for attracting investment from Chinese companies to strengthen India's export competitiveness.

— In Tuesday's statement, the government said that the applicability of PN3 restrictions to cases where LBC investors were having "only non-strategic, non-controlling interests" was seen as adversely affecting investment flows from investors, including global funds such as private equity and venture capital (PE/VC) funds.

— India had imposed restrictions on investments from China through Press Note 3 in April 2020, making government approval mandatory for investments from countries sharing a land border with India. The move was aimed at preventing opportunistic takeovers during the Covid-19 pandemic and had remained in force amid heightened national security concerns following the Galwan clash later that year.

— The PN3 was primarily meant for Chinese investors as entities of Bangladesh and Pakistan can invest only under the government route, while investments from other bordering countries such as Nepal, Myanmar, Bhutan, Afghanistan are very small as a share of India's total foreign investment inflows.

— The government's decision on easing the investment curbs comes amid the US-Israel strikes on Iran, which have resulted in a sharp spike in global oil prices, and present a looming threat for economies dependent on crude oil imports. The blockage of the Strait of Hormuz amid these strikes also presents supply-chain risks, the effects of which are already being felt by industries in India. The economic landscape has been turbulent since last year, marked by heightened US tariffs, which were later struck down by the US Supreme Court.

— The government had been considering an incremental approach towards allowing investments from China rather than a sweeping opening up of the Indian economy. India had already eased the business visa process for Chinese workers, and the government is now examining whether some could also be relaxed. There had been some signs that India was slowly but surely allowing Chinese companies to partner with Indian entities, especially in the electronics sector.

— Parallel diplomatic efforts have also sought to stabilise the broader relationship. Last year, New Delhi and Beijing agreed on a series of measures to repair ties: resumption of the Kailash Mansarovar Yatra; restoration of direct flights; issuance of visas for journalists and think-tank researchers, and the sharing of trans-border river data.

PRICE PRESSURES

The new series of the Consumer Price Index (CPI), the second data release of which was issued on Thursday, does not yet have enough historical data for robust comparisons, but does include enough information to provide clues about the future. Retail inflation in India quickened to a 10-month high of 3.2% in February 2026, largely driven by food inflation and precious metal prices. This rise is something that the government should take note of early, avoiding any complacency that might have crept in due to the low inflation levels of the last year or so. Food has a lower weight in the new series as compared to the old one, but is nevertheless a major driver of inflation



with a 36.75% weight in the overall CPI. Inflation in food and beverages rose to 3.35% in February from 2.1% in the previous month, driven by quickening price levels in the meat, oils, and fruits and nuts categories. Notably, inflation in tomato prices stood at more than 45%. Thankfully, this was accompanied by a contraction in prices of the two other staples — onions and potatoes — by 28% and 18%, respectively. A large part of the low inflation last year was due to a statistical base effect that is now gone. Looking ahead, there are various factors that could result in rapidly rising food inflation. The first is that climate scientists are predicting the return of the El Niño effect in the middle of the monsoon this year. A weak monsoon will naturally raise food prices. The second impact will depend on how long the conflict in West Asia continues. Sustained natural gas supply constraints will hurt fertilizer production, affecting food output and, eventually, prices.

The other factor that has driven inflation up, and which will likely remain a major driver in the near future, is the price of gold and silver. Gold jewellery saw inflation rise to 48.2% in February from an already-blistering 46.8% in January. Inflation in silver jewellery stood at more than 160% in both January and February. With global uncertainty and anxiety skyrocketing, the demand for safe-haven precious metals is not going to let up any time soon. Rising oil prices and LPG and LNG shortages are already raising input prices for industry, which will eventually be passed on to consumers. The Reserve Bank of India's Monetary Policy Committee has a tough job in its next meeting in April. Inflation is being driven by supply constraints, so trying to reduce demand by raising interest rates will not only have a minimal impact on inflation but could also further hurt growth when fuel constraints are already impacting it. The onus lies with the government and its efforts to expedite alternative sources of fuel.

TO STABILISE RUPEE, RBI MAY USE 2013 PLAN TO HELP BANKS MOP UP NRI DOLLAR DEPOSITS

The Reserve Bank of India may look to revive a strategy it last employed in 2013 to attract dollars into the country via the Foreign Currency Non-Resident (Banks) and Non-Resident External deposit routes. This could help stabilise the rupee, which is facing headwinds due to the heat of the West Asia conflict.

Exempting the two categories of NRI deposits from statutory pre-emptions — cash reserve ratio (CRR) and statutory liquidity ratio (SLR) — and the RBI opening a special window for banks to swap fresh, long-tenor FCNR(B) dollar funds at a fixed rate could be two options for the central bank to break the fall in the rupee and bolster its ability to intervene in the market, say experts.

The rupee has depreciated about 7.4% to ₹91.81 per dollar as of Tuesday from 85.49 as of end-March 2025 amid a widening merchandise trade deficit, including due to the U.S. slapping steep tariffs on Indian goods, and foreign portfolio investors (FPIs) selling in the domestic equity markets.

A weak rupee and high energy prices following the Gulf conflict can stoke inflation. India imports almost 90% of its crude oil requirement. Temporarily exempting FCNR (B) and NRE deposits from SLR and CRR (₹3 with the RBI), will enable them to direct all the deposits they raise into credit.

V. Rama Chandra Reddy, Head of Treasury, Karur Vysya Bank, observed that there have been net (dollar) outflows under the foreign direct investment (FDI) and the FPI routes in the third quarter of FY26.



So, to further bolster its firepower to intervene in the market, the central bank can consider incentivising banks to mobilise FCNR(B) deposits by providing them with a temporary exemption from maintaining the statutory reserve ratios. K. Arvind, Executive Vice- President (Head – Treasury), Tamilnad Mercantile Bank, opined that if RBI offers banks a window to swap fresh FCNR(B) dollar funds, it will be beneficial for all stakeholders. The RBI's ability to defend the domestic currency due to the swap will be further bolstered. Additionally, it will generate rupee liquidity for the banking system, and NRIs will get better returns.

He noted there will be an element of uncertainty about the future in the minds of NRIs due to the global ramifications of the West Asia conflict. So, they may channelise their overseas savings/investments into NR deposits with Indian banks.

RBI BUYS ₹50,000 CR. G-SECS FOR LIQUIDITY, TRANCHE 2 ON FRIDAY

With the prolonged war in West Asia likely to have far-reaching consequences on the Indian economy, the Reserve Bank of India (RBI) held Open Market Operations (OMO) buying ₹50,000 crore Government of India securities (G-Secs) of various maturities.

On Friday, 'on a review of the current liquidity and financial conditions,' the RBI decided to conduct OMO for buying G-Secs of ₹1,00,000 crore in two tranches of ₹50,000 crore each on March 9 and 13.

Monetary policy tool

OMOs are key money market policy tools used by the RBI to regulate money supply by buying or selling G-Secs.

The latest move is aimed at injecting liquidity.

The OMO is to offset liquidity constraints arising out of advance tax outflows and have sufficient funds for lending by banks.

Previous operations

In December 2025 and January this year, the RBI had conducted OMO purchases of ₹2,00,000 crore in four tranches of ₹50,000 crore each.

In May 2025, the RBI had conducted OMO purchases totalling ₹1,25,000 crore to support growth.

On Monday, the RBI also notified the Government of India had bought back G-Secs worth ₹6,309 crore via switch auction conducted by it and issued bonds worth ₹6,431 crore.

The securities purchased by the government were a part of the bonds scheduled to mature in the next financial year.

Rupee plunges

The Indian rupee fell to a record low of 92.36 against the U.S. Dollar on Monday owing to fears of a prolonged war in West Asia and on account of crude oil prices surging to more than \$110 a barrel.

With the reported intervention of the RBI, the Indian rupee, as per Clearing Corporation of India spot rate, closed at 92.21 a U.S. Dollar as compared with its previous close of 91.82, down 39 paise.



“In line with broader weakness across Asian currencies, the Indian rupee has depreciated against the U.S. Dollar as international crude oil prices surged past \$100 per barrel, reclaiming levels not seen since 2022,” said Dilip Parmar, research analyst, HDFC Securities.

“These soaring energy costs pose a significant threat to India’s trade deficit, GDP growth, and inflation, given the country’s high reliance on oil imports. Amid heightening geopolitical uncertainty, the spot USDINR is expected to remain firm, with a resistance level near 93.00 and established support at 91.80,” he added.

WHY ARE FINANCE COMMISSION GRANTS TO CITIES STILL SO LIMITED?

The story so far:

Cities continue to be the excruciating centres of capital accumulation at an unprecedented pace. Around 90% of total government revenue and nearly 67% of the country’s GDP is generated through urban centres. Yet the recommendations of the 16th Finance Commission (FC) emphasise that cities must find avenues to increase their own source revenue and expand the tax base, even as the overall devolution of funds to urban local bodies remains limited.

What do the numbers reveal?

Under the 15th FC, urban local bodies received roughly ₹1.2-1.3 lakh crore over five years. India’s GDP during that period hovered around ₹200-210 lakh crore. The urban transfer, therefore, amounted to approximately 0.12-0.13% of GDP.

Under the 16th FC, urban local bodies are to receive around ₹3.56 lakh crore between 2026 and 2031. This translates to roughly ₹75,000 crore per year, far from adequate for urban transformation. India’s GDP by then is projected at roughly ₹400 lakh crore, which means the ratio remains almost unchanged at roughly 0.13% of GDP.

Another catch is defining the ‘urban’. The data is drawn from multiple sources which estimate that the urban population will reach around 41% by 2031. In simple terms, this means that per capita devolution does not change significantly.

The illusion deepens when per capita figures are introduced. India’s urban population crossed 470 million around 2020 and is projected to approach or exceed 600 million during the 2026-30 FC cycle. When urban grants are distributed across this expanded demographic base, per capita transfers stagnate and may even decline in real terms.

Another issue concerns the utilisation of funds. Under the 15th FC, total grants to local bodies amounted to around ₹4.36 lakh crore. Yet a substantial portion remained unspent or pending utilisation, estimated at roughly ₹90,000-95,000 crore, including about ₹30,000-35,000 crore meant for urban local bodies.

What are tied grants?

Tied grants for cities refer to funds earmarked for specific sectors such as water supply, sanitation, and wastewater management, etc. Tied grants hamper fiscal autonomy because States — and cities — are required to spend the funds only on these specified categories.

The approach of the 16th FC is even more aggressive, leaving less space for cities to use funds, as they are also subject to performance-based grants, which means the grants will be released only



when certain performance criteria are met. These include improving fiscal discipline, ensuring the proper constitution of local bodies through regular elections, publishing provisional and audited accounts in the public domain, and constituting State Finance Commissions.

All of these are reasonable. However, the problem arises when 20% of the funds are linked to additional conditions, failing which cities will not receive that share. The key condition relates to increasing own source revenue (OSR) through property taxes and user charges. The benchmark kept by the FC is to raise ₹1,200 per household through such revenues.

Why does it raise federal concerns?

A sum of ₹10,000 crore is kept for the one-time incentive for peri-urban merger of urban villages with a population of more than one lakh.

This has two major problems. First, urban development is constitutionally a State subject, and a federal intervention to induce such a transition is dangerous, as merging the peripheries of just 10% of urban towns may translate into lopsided urban integration, with the primary aim being to generate own source revenues. Second, in many States, take for example Kerala, where rural local governments function robustly, merging rural areas into urban agglomerations could create administrative and civic complications. The 16th FC also remains largely silent on climate change and pays little attention to the growing pool of cess revenues collected by the Centre and kept outside the divisible pool. These cess collections now amount to around 2.2% of GDP — roughly ₹8.8 lakh crore. Much of this revenue is generated from cities, yet it still does not appear in the OSR.

The 16th FC appears to miss a basic fibre in the entire exercise: “let cities plan their own futures,” while the Centre acts as an enabler. After all, it is their money, and they have a legitimate right to its utilisation.

‘41%’ ILLUSION: A QUIET RE-ENGINEERING OF INDIA’S FISCAL FEDERAL LANDSCAPE

An Explanatory Memorandum issued by the Ministry of Finance on February 1, 2026, is seen as a useful document, not only for what it states or approves but also for observing a pattern of what it does not.

The Union government accepted the Sixteenth Finance Commission’s (FC’s) recommendation to retain the States’ share in the divisible pool at 41%. It also accepted the horizontal formula, the local body grants, and the disaster management corpus. However, it deferred everything structural, such as amending the Fiscal Responsibility Legislation, controlling off-budget borrowings, reforming power sector distribution companies, and rationalising subsidies.

This observed asymmetry is not bureaucratic caution. It became the settlement.

The headline number deserves scrutiny before the settlement does. A 41% share sounds like continuity. In nominal terms, it is. But the divisible pool is not gross tax revenues.

Cesses and surcharges, levied and retained entirely by the Union, sit outside the pool, and their share has been growing.

As the FC16 report documents, the divisible pool as a proportion of gross tax revenues averaged 89.2% during the FC13 period, fell to 82.1% during FC14, and dropped further to 78.3% during FC15.



The Commission acknowledges this trend, notes its undesirability, and declines to fix it. Hence, 41% of a shrinking base is not 41% of total collections.

FC16 has also discontinued revenue deficit grants, sector-specific grants, and State-specific grants, instruments that offered targeted fiscal relief to States. The Commission projects that combined general government debt will fall from 77.3% of GDP in 2026-27 to 73.1% by 2030-31.

The aggregate trajectory looks orderly. It is the disaggregated picture where the real argument begins.

Structural deferrals

FC16 was aware of the fault lines it chose not to repair. Its chapters on State finances, power sector losses, and subsidies name them directly. The Commission identified States with structurally unsustainable fiscal trajectories. It called for reforms. It attached no binding enforcement mechanism to achieve them.

The most consequential gap is the residual asymmetry left by the end of GST compensation in June 2022. States lost a guaranteed 14% annual growth in SGST revenues without a structural replacement.

Tamil Nadu alone estimated a shortfall of nearly ₹20,000 crore in 2024-25. The Commission reads aggregate SGST buoyancy as evidence of recovery. The distributional stress has not followed.

The second deferral concerns off-budget borrowings and fiscal rules. FC16 documented how States borrow through government-controlled entities and service those liabilities from the budget, keeping them invisible in headline deficit figures.

It is recommended that States discontinue this practice and that the Fiscal Responsibility Legislation (FRL) frameworks be amended.

The Explanatory Memorandum accepted the quantum of borrowing ceilings in principle, then noted that off-budget controls, FRL amendments, and the Union's own fiscal deficit path would be examined separately. That phrase has a history in Indian fiscal federalism. It means not now.

The Commission's own inter-State comparison documents the backdrop. Punjab carried a debt-to-GSDP ratio of 42.9% in 2023-24 and a revenue deficit of 3.7% of GSDP, borrowing primarily to address revenue shortfalls rather than build capital assets.

Rajasthan's outstanding liabilities stood at 37.9% of GSDP, West Bengal's at 38.3%, and Andhra Pradesh's at 34.6%. Each operates under fiscal rules that, by the Commission's own assessment, are effectively unenforced. The recommendation to reform those rules was made. The Union noted it for later.

Rewarding the Centre's priorities

Two choices in FC16's transfer architecture repay close reading.

The first is the replacement of the tax and fiscal effort criterion in the horizontal devolution formula with a contribution to GDP criterion. Under FC15, States received a 2.5% weight based on their own tax revenue efficiency relative to economic capacity, rewarded for trying harder.



The new criterion, assigned a 10% weight, allocates resources in proportion to each State's contribution to national GDP, measured as the square root of its GSDP relative to all States. Maharashtra, Gujarat, and Karnataka, large, high-GSDP States that already generate substantial own revenue, benefit structurally from this shift.

Bihar, Jharkhand, and Uttar Pradesh, which are States with lower per capita incomes and greater fiscal need, do not. This is not a technical adjustment. It is an inversion of equalisation logic: the previous criterion rewarded effort, the new one rewards weight.

The shift from tax & fiscal effort (2.5%) to contribution to GDP (10%) is the defining structural change. The second is the conditionality architecture of the local body grants. The ₹7,91,493 crore recommended for rural and urban local bodies is divided into basic and performance components, with access contingent on entry-level conditions covering constituted bodies, audited accounts, and the timely constitution of State Finance Commissions.

Performance grants add further layers tied to own-source revenue benchmarks and Central database compliance. Each condition is defensible in isolation. Together, they construct a system in which the gap between a State's entitlement and its actual receipt depends on its capacity to meet Central monitoring requirements.

States with weaker governance infrastructure, which tend also to be States with greater fiscal need, face that gap most acutely. The FC15 period offers a precedent, where urban local body grants were released at only 62.6% of the recommended amount.

Read alongside the Commission's report, the Explanatory Memorandum reveals a consistent logic. The Union accepts what gives it budgetary predictability: the 41% share, the formula, and the grants.

It defers what would require sharing structural authority, fiscal rule reform, off-budget liability controls, and power sector restructuring. Where FC16 diagnosed a problem and recommended a remedy, the Union took note. Where FC16 designed a flow and set an amount, the Union accepted it in full.

What makes the FC16 moment distinctive is that it arrives after years of documented State-level fiscal deterioration, the Commission's own data confirms.

Punjab borrows to pay salaries and service existing debt, not to build infrastructure. Andhra Pradesh carries reorganisation-era liabilities that no Finance Commission has resolved. Rajasthan's revenue deficit persists across multiple award periods. The Commission saw each of these. The Memorandum took note.

A federal structure whose transfers increasingly reward economic weight over fiscal need, whose structural stress is deferred cycle after cycle, and whose only reliable outcome is the perpetuation of Centre-State asymmetry is surely not a system in good health. It has somehow learned to look like it is – and that is deeply troubling and unsettling for the fiscal-federal character of India's constitutional republic which can result in long-term implications and an exacerbating civic divide.



FARM LOAN WAIVERS RETURN: HOW IT COULD IMPACT CREDIT CULTURE

The Maharashtra government announced a Rs 35,000 crore waiver scheme last week, potentially impacting the state's credit culture and finances. It also comes despite past advisories issued by the Reserve Bank of India (RBI) and several working groups against the practice.

Key Takeaways:

- The state government maintains that its finances remain robust and it is prepared to absorb the fiscal burden of what it calls a necessary step to safeguard the interests of the farming community. However, Maharashtra is not an outlier, and the increasing trend of loan waivers has wider negative implications.
- After two nationwide waivers initiated by the Central government since 1990, farm loan waivers have seen an unprecedented increase since 2014-15, driven by announcements from state governments.
- The policy of farm loan waivers is grounded in the rationale of alleviating the debt overhang of beneficiaries, thus enabling them to undertake productive investment and boost real economic activity.
- While the risk to farmers' income — nature's risk as well as market risk — can cause significant distress, loan waivers, which often occur around elections, are “not the panacea to address the underlying risks”, according to the RBI. In reality, the practice can undermine the credit culture, adversely affect state finances, and harm farmers' interests in the medium to long term.
- Generally, incumbent state governments see such announcements as giving them an obvious political edge for elections.
- The first major programme on farm loan waiver, the Agriculture and Rural Debt Relief Scheme, 1990 (ARDRS), was undertaken nationwide in 1990, followed by another nationwide loan waiver in 2008, viz., Agricultural Debt Waiver and Debt Relief Scheme, 2008 (ADWDRS).
- The ARDRS programme, which came into force on May 15, 1990, covered short-term loans and overdue installments of term loans outstanding to public sector banks (PSBs) and Regional Rural Banks (RRBs) as on October 2, 1989. The maximum relief amount under the program was Rs 10,000 per farmer, and there was no differential treatment based on the size of their landholding.
- The 2008 ADWDRS programme was broader in its coverage of institutions, including scheduled commercial banks (SCBs), RRBs, co-operative credit Institutions (both urban and rural) and Local Area Banks. The programme targeted higher relief for small and marginal farms (with a landholding of up to five acres) vis-à-vis other farmers.
- Since 2014-15, ten states have announced loan waiver programmes of an aggregate Rs 2.4 lakh crore (1.4% of the 2016-17 GDP at current prices) — significantly higher than the two nationwide debt waiver programmes, according to the RBI.
- The impact of loan waivers on states' Budgets is typically staggered over three to five years, either due to phased rollouts or by clearing bank dues over multi-year payouts.



— Alongside a sharp deceleration in growth of agricultural credit outstanding, a decline in agricultural credit disbursements was observed in the years of loan waiver programmes, with growth bouncing back in subsequent years, the central bank said.

— The central bank has discouraged loan waivers on various occasions, noting that the practice affected the credit culture, as many borrowers withheld repayment in anticipation of a loan waiver. This adversely affects borrowers' credit history and their prospects of availing fresh loans for agricultural purposes.

— According to an SBI research report, since 2014, of approximately 3.7 crore eligible farmers, only around 50% received the loan waiver amount by March 2022. Despite much hype and political patronage, states' farm loan waivers have failed to bring respite to their intended subjects, sabotaging credit discipline in select geographies and making banks and financial institutions wary of further lending, the SBI report concluded.

— Instead, it pitched for an income support scheme, arguing that with a lower spending of Rs 50,000 crore, a larger benefit can be accrued to the target groups.

DEVELOPMENT MEANS EXPANSION OF CHOICES IN AMARTYA SEN'S 'CAPABILITIES APPROACH'

In everyday language, "capabilities" often refers to an individual's skills or abilities. However, in the work of economist Amartya Sen, the capabilities approach carries a much deeper meaning. Sen conceptualised capabilities as the substantive freedoms that enable people to lead the lives they value.

Sen, who received the Nobel Prize in Economic Sciences in 1998, has consistently argued that development must be understood not merely as economic growth but as the expansion of human freedoms. His early collaboration with Pakistani economist Mahbub ul Haq shaped the influential idea that development should be seen as the enlargement of human choices rather than simply an increase in national income. This perspective challenged the dominance of purely economic metrics in development thinking.

Sen's position also reflects his liberal philosophical commitments. For instance, he differed from philosopher Martha Nussbaum, who proposed a central list of capabilities that governments should guarantee. Sen was cautious about prescribing such a universal list, fearing it might become paternalistic. Instead, he preferred a more open framework that allows societies to debate and determine which freedoms matter most. Despite these differences, the capabilities approach broadly emphasises the moral importance of freedom in achieving human well-being. Yet translating these ideals into public policy, especially in a country like India, remains a major challenge. The state's inability to nurture enabling conditions such as critical thinking is deeply concerning. In an era shaped by post-truth politics and the growing influence of artificial intelligence, the erosion of thinking skills raises serious questions about the quality of democratic life.

Equally troubling are the declining standards across education and related sectors, particularly in an economy increasingly dominated by service industries. While the capabilities approach has long faced questions about how to operationalise its ideas in policy, the current political climate presents an even deeper challenge. Weakening standards of governance and shrinking political



freedoms have created an environment where facts and truth themselves are losing relevance. This affects not only activists but also the very possibility of serious academic debate.

The result is a troubling disconnect between theory and practice. Neither appears capable of illuminating the path forward. The idea of praxis, the integration of thought and action, remains largely absent. In such a situation, philosophical ideals, such as John Rawls' "veil of ignorance", seem never to have been meaningfully applied in real political contexts.

Sen's central argument that development is freedom is therefore not merely academic. It is deeply political. His intellectual foresight lies partly in his deliberate openness when defining capabilities. By refusing to reduce development to indicators such as GDP or per capita income, he simultaneously challenged the dominance of economic reductionism and reaffirmed the centrality of human freedom. For Sen, development must be understood through the expansion of social opportunities and economic security, shaped by the voices and agency of people themselves. This is why he emphasised the intrinsic value of capabilities, not merely their instrumental benefits.

In contemporary policy discourse, however, capabilities are often reduced to skill formation aimed at employability. Education is increasingly framed solely as a pathway to jobs. Sen never denied the importance of employability, but he cautioned against reducing education to this instrumental goal alone. Education, in his view, must also nurture the broader freedoms that allow individuals to think, reason, and participate meaningfully in society.

Equality of autonomy

To understand the complexity of human life, the capabilities approach also draws from cognate frameworks such as complexity theory, recognising that social realities cannot be neatly predicted or engineered. Sen's emphasis on the "equality of autonomy" reflects his broader liberal conception of justice.

In this context, his distinction between *niti* (formal institutions and rules) and *nyaya* (realised justice) is particularly important. It reminds us that justice cannot be understood solely through institutional design; it must be evaluated in terms of the lived experiences of people. Unfortunately, academia often struggles to bridge the gap between the "book view" and the "field view." This disconnect becomes even more visible in a post-truth environment where information is easily mistaken for knowledge, and capabilities are reduced to narrow technical skills. Such reductionism reflects deeper moral and institutional fault lines. When scholars fail to translate complex ideas into meaningful public discourse, academic debates risk becoming institutionalised rhetoric where professors profess little that is genuinely new. The consequences of this failure are visible in the declining credibility of the state, the market, and civil society. Increasingly, we see a convergence of state power and market interests, giving rise to what might be described as plutocratic populism. In such a context, civil society weakens and the idea of development becomes narrowly tied to economic growth. This misreading of the capabilities approach is deeply problematic. The framework was originally intended to place people at the centre of development, emphasising their agency rather than treating them as passive beneficiaries of economic expansion.

Today, however, even complex social realities are often reduced to simplistic narratives. Identities are homogenised, rhetoric replaces research, and "alternative facts" begin to substitute for careful analysis. If the capabilities approach is to remain meaningful, we must return to its fundamental question: how can individuals become active agents of development rather than mere recipients



of policy interventions? Only by restoring this emphasis on human agency can development once again be understood as the genuine expansion of people's freedoms and choices.

REGULATIONS TO IMPLEMENT NEW RURAL JOB ACT YET TO BE FINALISED

The Viksit Bharat — Guarantee for Rozgar and Ajeevika Mission (Gramin) (VB-G RAM G) Act, 2025, has several steps to clear before it can be implemented.

According to sources, the Union Rural Development Ministry is holding weekly consultation meetings with the State governments.

There are several tricky issues that the Centre must navigate, including coming up with a formula for “normative allocation” for the States. The objective parameters for this are yet to be finalised. Under the legislation, these may be prescribed by the Union government.

The Union government has to frame rules under 11 categories, for example on social audit of the scheme.

The new rural employment legislation, which was passed by Parliament within two days of its introduction on December 16 last year, replaces the Congress-led UPA government's flagship scheme, the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA), 2005.

Section 4(5) of the legislation says, “The Central government shall determine the state-wise normative allocation for each financial year, based on objective parameters as may be prescribed by the Central government.”

This clause is intended to ensure a more equitable distribution of resources, following complaints from several economically weaker States that they receive a smaller proportion of funds. These objective parameters are yet to be finalised.

Past performance

“Several State governments that were among the best performers under MGNREGA argue that the objective parameters should also take into account their past performance, while other States contend that the parameters should reflect the demand in a State, especially in those with high rates of migration of rural workers,” a senior official of the Ministry of Rural Development said.

The legislation requires that all Gram Panchayats be categorised as A, B, or C, based on development parameters. The Act cites only one example — “proximity to urban areas” — of what these “development parameters” could entail. The Centre, currently in consultation with the States, is working on framing these parameters. For the scheme to roll out, State governments must have at least five basic elements in place, a top official said.

Five essential elements

These include ensuring that ongoing work under the old legislation — MGNREGA — is completed.

Second, the States must enrol themselves on DBT Sparsh, a banking platform. For the first time since the launch of the rural employment scheme, the Centre and the States will share the financial burden. West Bengal has not yet enrolled on the platform, according to sources.

Third, the ongoing drive to conduct e-Know Your Customer (EKYC) verification of MGNREGA job cards must be completed.



Finally, State governments must onboard Yuktdhara, a geospatial planning portal that the Centre wants used for preparing the Viksit Gram Panchayat plan, which will function like a master schedule of all works planned for the year.

Sources indicated that the new legislation may not be ready for roll-out by April 1 this year.

From the day the new Act is notified by the Centre — to be treated as the commencement date — the State governments will have six months to implement the scheme.

ARBITRARY AND OPAQUE

The manner in which the Employees' Provident Fund Organisation (EPFO)'s Central Board of Trustees (CBT) approved the Employees' Pension Scheme (EPS) 2026, on March 2, replacing the EPS 1995 scheme, has raised serious transparency concerns. This affects approximately 5.4 crore contributing members and 82 lakh pensioners. Although the EPS and the Employees' Provident Fund and Employees' Deposit-Linked Insurance Schemes were designed as a corollary to the Code on Social Security, 2020 — which was abruptly notified in November 2025 along with three other Codes — neither the government nor the Labour Ministry had, until now, given any hint of the new schemes. The stakeholders were not consulted by the authorities. More than any other scheme, the EPS 1995, has over the past decade, dominated headlines due to litigation in various courts, including the Supreme Court of India. Over the past 12 years, certain features of the scheme were altered, to the detriment of employees. For instance, coverage of the Pension Scheme was limited to those earning up to ₹15,000 a month, instead of offering universal coverage as originally intended. The pensionable salary calculation changed from the average pay in the last 12 months to 60 months, substantially reducing the amount of eligible pension. The unrestricted option for pension on a higher pension was limited to those who had exercised the option within a year of the modified scheme that came into force on September 1, 2014. With the Supreme Court's intervention in 2022, the higher pension option was extended to post-2014 retirees as a special case. Unfortunately, pre-2014 retirees were left in the lurch as the unrealistic conditions set by the PF body made most of them ineligible for higher pension.

In the new Pension Scheme approved by the CBT, the option provision has been removed as it is considered 'obsolete' for reflecting a narrow legal interpretation. Moreover, those hoping for an upward revision of the ₹15,000 PF contribution ceiling are disappointed, as no such indication has been given so far. Both the wage ceiling and the minimum pension of ₹1,000 were fixed over 11 years ago. The EPFO's overall approach seems to be aimed at reducing what authorities describe as the burden of pension commitment. With greater government funding and higher contributions from employers and willing employees, the EPFO can well meet pension challenges. A positive mindset along with empathy for pensioners and contributors is what is needed from the Union government and EPFO. A mere change of laws, regulations and procedures will not deliver the results desired by crores of members and lakhs of pensioners.

ELECTRIFYING INDUSTRIAL HEAT AS A PATH TO INDIA'S THERMAL INDEPENDENCE

In the industrial town of Morbi in Gujarat, the air usually hums with the roar of gas-fired kilns producing millions of square metres of ceramic tiles. Today, however, a quarter of those kilns are cold. Nearly a thousand kilometres away in Ludhiana, Punjab, the textile hubs that clothe a third of India are facing a similar paralysis. The reason is geopolitical.



As the conflict between the U.S. and Iran intensifies, the Strait of Hormuz, the world's most vital oil and gas artery, has turned into a gauntlet. India imports nearly half of its natural gas and immediately felt the pinch — rendered more painful by the Ministry of Petroleum and Natural Gas, slashing gas allocations to non-priority industrial sectors to just 65-80% of their contracted volumes.

The need for thermal independence

For the manufacturers in Morbi and Ludhiana who began experimenting with new energy models years ago, the present crisis must be a moment of validation as they accelerate towards concentrated solar thermal (CST) technology and the large-scale electrification of heat. For others, however, it can seem like an ultimatum to fast-track decarbonisation and, for India overall, a reminder that it needs thermal independence, i.e. a 'sovereign' source of heat, rather than just energy independence.

For decades, industrial heat has been synonymous with burning hydrocarbons like coal or gas. In Ludhiana's textile mills, for instance, large boilers burn gas to create steam used in dyeing and finishing. In Morbi, gas flames bake tiles at temperatures exceeding 1,000 °C.

Rooftop solar photovoltaic panels have become common but they are designed to produce electricity, not the raw, intense heat that industries demand, so this is where CST has become relevant. While photovoltaics use semiconductors to convert renewable sunlight into a stream of electrons, CST uses precisely controlled mirrors to concentrate sunlight onto a receiver, where it heats a fluid like water or molten salt to up to 400 °C.

Most textile processes, including scouring and bleaching, require a temperature between 100 °C and 180 °C. By installing parabolic troughs on factory grounds or nearby land, these mills can generate pressurised steam directly from sunlight.

According to data from the Ministry of New and Renewable Energy, India has a CST potential of 15 GW. Adoption, however, remains low — but as gas prices have already tripled due to the war in West Asia, the payback period for a CST installation has already shrunk from seven years to less than three.

For more than a century, people at homes, engineers in laboratories, and industrial operators have burnt fuel to create hot air, then transfer that heat to a product even though it is highly inefficient. For instance, a gas boiler loses 20-30 percent of its energy just in the exhaust. The electrification of heat, on the other hand, replaces the flame with electromagnetic fields and plasma. For example, an induction stove passes an electric current through a coil, creating a magnetic field that generates heat directly inside the metal or in the material being processed. There is no intermediary substance like air or steam that takes away a part of the heat, so the efficiency rates of such heaters have been known to exceed 90 percent.

In Morbi, several forward-thinking ceramic units are also experimenting with plasma torches for their kilns. Here, gas is ionised to a state called plasma. Plasma torches also allow users to closely control their temperature, thus preventing under- or over-heating for different processes.

Infrastructural challenges

The bigger question, however, is whether India's grid is ready. If every factory in Ludhiana and Morbi switched to induction and plasma heating tomorrow, the power grid would likely collapse. This is because industrial heat currently accounts for around 25 percent of India's total energy



consumption and shifting that load from gas pipes to electric wires would be an engineering challenge.

Most factories operate on a 24/7 cycle whereas solar and wind energy are intermittent, so in order to electrify heat for industry, India needs round-the-clock renewable power, which entails a large rollout of battery energy storage systems and pumped hydro storage. At present, India's storage capacity is in its infancy and without it, the grid is not in a position to sustain the large 'spikes' of energy that heavy industrial induction furnaces demand.

Second, local power grids in industrial clusters like Ludhiana are often ageing. High-capacity induction heating requires high-voltage substations and reinforced cabling for last mile supply. Asset-loading reports from DISCOMs (electricity distribution companies) in industrial clusters suggest that roughly a quarter to a third of distribution transformers can be critically loaded during peak hours, with little headroom for additional demand.

These constraints accentuate CST's advantage, especially as a source of heat that does not depend on the grid. By generating thermal energy on-site and storing it in insulated tanks, a factory can continue operating even at night without drawing a single watt from the national grid. Thermal storage is also much cheaper than lithium-ion battery storage.

To survive the LPG crisis and complete the transition to electrified heat, India needs a 'National Thermal Policy'. Its current subsidies focus heavily on electricity (photovoltaics in particular) whereas there are few incentives for direct-heat technologies like CST. The government should consider providing the same production-linked incentives to CST mirror manufacturers that it gave to solar cell manufacturers. India also needs to reform the carbon market to allow factories in Morbi, say, to sell their 'avoided emissions' through the nascent Carbon Credit Trading Scheme and use the revenue to offset the high capital cost of electric kilns.

Global policy lessons

Industries can also benefit from hybrid solutions given the inherent advantages of being able to modernise without junking their existing infrastructure first. For example, a CST system can operate during the day, a small gas-based backup system can support peak loads, and induction coils can provide heat for precision processes. The 'Miraah' project in Oman offers a useful example: engineers integrated one of the world's largest concentrated solar thermal plants with an existing gas-fired industrial operation. Thus, solar energy generates steam in daytime, reducing gas consumption by nearly 80%, while the gas boilers were on standby, and for nighttime use.

The 'Solar Heat for Industrial Processes' initiatives in Spain have allowed the company Solatom to develop plug-and-play solar thermal units: pre-assembled, containerised mirror arrays that a factory can install on a roof or a small parking lot and connect directly to its existing steam network. Denmark reformed its energy market to support 'heat purchase agreements', whereby an external provider installs and maintains a CST or induction system and the factory simply buys the heat at a fixed rate, typically cheaper than gas. Such solutions substantially lower the engineering costs for new adopters.



LIFE AND SCIENCES

ASTEROID YR4: NO LONGER A THREAT

NASA has officially ruled out the possibility of asteroid 2024 YR4 colliding with the moon in 2032. This update settles concerns that first surfaced after the asteroid's discovery in late 2024. For several months, orbital models suggested a small but notable 3.8% to 4.3% chance that the rock would strike the lunar surface on December 22, 2032.

To resolve the uncertainty, experts from NASA's Centre for Near-Earth Object Studies used the James Webb Space Telescope to track the object. In February, the team made two important observations while the asteroid was extremely faint, a feat impossible for most other observatories. These new data points have reportedly allowed the scientists to refine the asteroid's trajectory with higher precision.

The latest calculations show that 2024 YR4 will safely bypass the moon at a distance of around 21,200 km. This follows an earlier update regarding the earth: while data in early 2025 indicated a potential threat to our planet, subsequent analysis ruled out a terrestrial impact for the next century at least.

Astronomers have said that these shifts in probability are a standard part of planetary defence. When scientists first discover a near-earth object, they must calculate its path using limited information, which often results in a wide range of possible outcomes. As they collect more data over time, they narrow those possibilities down. In the case of the 65-meter-wide 2024 YR4, the newest evidence confirms it is no longer a threat to the earth or its moon.

'DELAYS IN STARSHIP RISK NASA'S MOON LANDING PLAN'

SpaceX's Starship has accumulated at least two years of development delays since NASA picked the rocket as an astronaut moon lander in 2021, and is expected to require more time to clear remaining hurdles before landing on the moon, NASA's inspector general said on Tuesday as the agency studies plans to speed up the programme.

NASA has been working with an array of companies, most prominently Elon Musk's SpaceX and Jeff Bezos' Blue Origin, in its multibillion-dollar Artemis programme to kickstart routine astronaut missions to the moon, pressed to do so before China sends its own crews to the lunar surface by around 2030.

But mounting delays in SpaceX's development of Starship — tapped as the programme's first lander to deliver NASA astronauts to the moon — have gradually pushed back what was originally a 2024 target moon landing, though officials at the time treated 2024 with scepticism.

Among the most challenging steps in Starship's path to become an astronaut-rated lunar lander, Tuesday's report said, is the rocket's requirement to refuel itself in space before journeying the rest of the way to the moon, a risky and delicate process never attempted at such a scale. For one Starship to land a crew of astronauts on the moon, SpaceX will first need to launch more than 11 other Starships into the earth's orbit that will act as refueling tankers. One of these Starships will be a propellant storage depot requiring more than 10 Starships to fill with enough fuel that will be transferred to the Starship that will land on the moon.



Taller than a 15-storey building, Starship is fuelled by roughly 1,200 tonnes of liquid methane and liquid oxygen, two highly explosive propellants that must be kept at cryogenic temperatures, or temperatures below -150°C . Docking Starships together and carefully transferring super-cooled propellants at least 10 times in low-earth orbit — a politically and commercially vital region of space with a soaring level of satellite traffic — would be among the riskiest challenges for a company that has already rendered orbital rocket landings and astronaut launches to the International Space Station routine.

NASA officials overseeing Starship development “considers demonstrating cryogenic propellant transfer to be one of the most significant technical challenges facing” SpaceX, the report said. “NASA is tracking a top risk that some of the cryogenic technologies and capabilities SpaceX is developing will not be adequately mature” ahead of a 2028 moon landing, the report said.

SpaceX has launched its Starship system 11 times since 2023.

NASA Administrator Jared Isaacman had recently reconfigured the Artemis III mission into a low-earth orbit test flight in a bid to accelerate the programme by standardising rocket configurations and reducing the number of uncrewed test flights required of its commercial partners.

SIMULATED REALITY

Why do some people believe the whole universe is a simulation?

In half a century, video games have gone from dots on a screen to lifelike 3D worlds. Believers argue that in future, we'll eventually create simulations indistinguishable from reality. If an advanced civilisation creates millions of such simulations, simulated 'people' could far outnumber real people. Extrapolating from there, if there are a million 'fake universes' and only one real one, it's statistically more likely that we're in a fake one. There are many problems with the idea. It doesn't explain the origins of reality, only abstracts it back one level. Second, our universe alone being real is simpler than our universe being simulated by a parent universe (Occam's razor). The best computers also struggle to simulate hundreds of atoms at the quantum level; simulating a universe could demand more energy than what the universe itself holds. One condition for a scientific theory to be valid is it must be falsifiable: you can test it and potentially prove it wrong with an experiment. The simulation idea isn't falsifiable.

COOLING EFFECT: ON THE WANE

A new study published in Geophysical Research Letters has confirmed that global warming has entered a phase of significant acceleration. For decades, the earth's temperature rose at a steady rate of about 0.2 degree Celsius per decade. Recent record-breaking years sparked a debate among scientists about whether this pace was increasing but natural events such as volcanic eruptions and solar cycles frustrated efforts to find a definitive answer.

University of Potsdam researchers addressed this by stripping away these natural factors from five major global temperature datasets to reveal what they have said is a clearer underlying trend. Per their analysis, reported with 98% confidence, global warming has indeed accelerated, with the shift becoming statistically significant around the year 2015. In fact, the earth appears to have warmed faster over the last decade than during any other decade on record.

The authors said the cause was likely a drop in aerosol levels: these pollutants reflect sunlight and mask some of the warming caused by greenhouse gases. But as countries cleaned up air pollution,



they inadvertently removed their cooling effect, allowing the world to feel the full heat of global warming.

The implications are urgent. The researchers have projected that at the newfound rate, the earth could breach the 1.5 °C limit established by the Paris Agreement by 2030. In turn this suggests that current efforts to curb emissions are insufficient and that to buck this trend, humankind may have to reach net-zero emissions far more quickly.

WHY ARE AI-GENERATED ANIMAL VIDEOS ON THE RISE AND WHAT HARM CAN THEY CAUSE?

The story so far:

Open up Instagram, Meta AI, TikTok, YouTube Shorts, or X on your phone and it won't be long before you scroll to a short video clip that shows animals and humans sharing a bizarre encounter.

While an AI-generated video of a man taking an underwater selfie with a shark is easy to identify as fake, more realistic generative AI videos can warp the way we think about wild animals and their behavioural traits, putting both them and us in danger.

Why are AI animal deepfakes on the rise?

This is thanks to a barrage of Generative AI tools that allow users to enter text prompts in everyday language and churn out hyper-realistic videos at scale that can be easily uploaded online.

As platforms like Meta pivot to short-form videos in an attempt to surpass TikTok, while X rewards virality and engagement, users are incentivised to make and share more low-cost, low-effort content.

As a result, you might have seen gorillas breaking out of zoo enclosures, crocodiles gobbling up their handlers, dying lions surrendering their cubs to humans, fishermen rescuing polar bears, and monkeys dancing with children.

These videos are generally called "AI slop" due to their low-grade entertainment value and short length. Often shared with sensationalised captions or presented as though they are real news events, viewers inevitably waste their time trying to figure out if the content is real or AI-generated.

Violence is also a major pull factor in AI animal videos: a giraffe is decapitated by an overhead bridge, a gorilla smashes a tiger with a boulder, a hippo excretes in the face of another animal with the power of a missile, a crazed shark mauls a swimmer, and a whale swims after a desperate Arctic fox.

Such videos come with or without melodramatic storylines. These are reshared, repeated, and re-adapted by others hoping to go viral.

What harm can AI animal videos cause?

AI-generated animal videos rack up millions of views on platforms like X and YouTube, because they are seen by viewers across age groups and with varying levels of media education and digital literacy. In essence, AI animal videos can change our relationships with animals.



For example, a video of a little girl feeding puppies or a boy dancing with a monkey on Meta AI might seem like harmless, heartwarming slop, but they downplay the dangers of parents letting their children approach unvetted animals without expert supervision, especially in a country struggling to tackle rabies.

Research in this area is ongoing, but a September 2025 report titled ‘Threats to conservation from artificial-intelligence-generated wildlife images and videos’ [Conservation Biology, 40, e70138] explores how AI images and videos of animals might undermine conservation efforts by spreading misinformation.

According to the report, AI animal videos can make social media users believe that endangered/vulnerable creatures are actually easy to find around them. Exposure to inaccurate AI animal videos could also confuse children on social media, and set back efforts to identify diverse types of animals or tell apart native species.

Other possible outcomes outlined in the report could directly harm animals. These include overtourism due to AI-generated animal sightings, spreading the false idea that animals have human behavioural traits such as affection for children (known as anthropomorphism), or making exotic pets look attractive in spite of laws prohibiting wildlife trafficking.

“Some AI videos depict interspecific interactions that are implausible, for example, affiliative behaviours between animals of different species, including between predators and prey, and between parasites and hosts. Some videos depict friendships between humans and wild animals, which can be dangerous if, in an encounter with an animal, a human fails to recognize it as a potential threat,” noted the paper’s authors.

How do conservation groups feel about AI?

The responsible application of generative AI technology definitely helps out experts in the conservation sector, according to Dipankar Ghose, Senior Director-Biodiversity Conservation, at WWF-India.

The organisation is using AI to identify images of large mammals caught by camera traps and segregate hundreds of them by their species in a matter of minutes. If done manually, this process would have taken days. AI is also used for bioacoustics and creating data-driven content.

However, Ghose was strongly against AI videos of animals made for entertainment.

“It is a dangerous trend in which AI is used to create hyper-realistic clips of tigers picking up people from their beds or leopards drinking water from a kid’s water bottle, all completely fake!” he explained.

“It is a nightmare for conservationists and wildlife and forest managers, particularly the officers and field staff of state forest departments and administration, as public perception can be manipulated by these fake videos, which may result in retaliatory violence against wild animals.”

HEAT DURING PREGNANCY RESULTS IN FEWER MALE BABIES: STUDY

When pregnant women experience higher ambient temperatures during gestation, fewer males are born, a recent analysis of demographic and health surveys in sub-Saharan Africa and India showed.



A paper titled ‘Temperature and sex ratios at birth’ in the journal *Demography*, by Jasmin Abdel Ghany et al., concludes after a detailed analysis that experiencing higher ambient temperatures during pregnancy is associated with changes in the natural sex ratio at birth across India and sub-Saharan Africa. The paper analyses over five million births drawn from more than 90 Demographic and Health Surveys, containing local temperature data to examine how heat exposure across trimesters shapes sex ratio at birth.

The researchers write: “We find that days with a maximum temperature above 20 °C are negatively associated with male births in both regions. In sub-Saharan Africa, we observe fewer male births after high first-trimester temperature exposure, consistent with increased spontaneous abortions from maternal heat stress... By contrast, in India, we find that second-trimester temperature exposure is associated with fewer male births.” These reductions are focused among older mothers in rural areas who have had a number of children, the study highlights.

The daily maximum temperature in the month of birth is 30.0 °C in sub-Saharan Africa and 30.3 °C in India. In India, in the second trimester, the results indicate a negative relationship between temperature exposure and birth sex. The effect of a 25 to 30 °C indicates a lower male birth probability by 0.014 percentage points.

To account for both biophysical health and behavioural mechanisms, researchers chose two regions with vastly different experiences with son preference and sex-selective abortion: India (where several regions have high son preference and sex selective abortions) and sub-Saharan Africa (where there is little evidence of son preference and sex-selective abortions are minimal). The hypothesis is that these heat-induced pregnancy losses are male-biased, in line with Trivers and Willard’s “frail male” hypothesis. “According to this evolutionary argument, weak males may have a lower chance of surviving to birth under poor environmental conditions. After birth, males have lower survival probabilities than females and thus require greater maternal investment, the authors write.

Vidhya Venugopal, Country Director (NIHR GHRC NCD-EC), Faculty of Public Health, Sri Ramachandra Institute of Higher Education and Research, Chennai, says the results are not unexpected. They underline the urgency to examine solutions to protect vulnerable groups when temperatures soar.

“When your body temperature rises by one or two degrees above the basal temperature, it is a fever. Pregnant women already have a higher body temperature and if there are rising heat situations, there will certainly be a cascade of negative impacts... In pregnant women, there is a definite increase in adverse events, including hypertension, gestational diabetes, and preterm births; the risk of underweight babies increases,” she explains.

While heat is considered ‘extremely natural in tropical countries’, the impact of heat stress, particularly on people who live in resource-poor settings, is grossly underestimated, Dr. Vidhya says.

Jane Hirst, Chair in Global Women’s Health, The George Institute for Global Health, Imperial College London, agrees. “Most of the evidence associating that risk is not from the hottest, or the low and middle income countries, she adds. That is slowly changing,” she says. Evidence is now emerging from these nations also, indicating the risks might actually be greater. “For instance, the combined global evidence points to a 25 % increase in pre-term births with heat stress. Our study in Tamil Nadu, however, indicated that it was three times the risk, nearly 300%.” There is a huge



role for governments to play here, Dr. Vidhya and Prof. Jane agree. Both of them see communicating risk to the vulnerable populations as a key step, as risk perception is very low, and thereby, the capacity to intervene as well. Protecting vanishing traditional knowledge systems that allow for resource-appropriate cooling mechanisms, including the diet, is also important, Dr. Vidhya says.

Structural changes must also be initiated according to Prof. Jane — make sure the antenatal clinic is located inside a well-ventilated building, or safe drinking water is available to help them cool off. “The Indian government has taken the lead in putting together heat action plans, at the regional and sub-regional levels. However, a third of them did not consider pregnant and lactating women and infants as a vulnerable group,” she points out. While ensuring that there is sufficient funding and resources for climate engineering, Prof. Jane says it is important to learn from the best practices. The SMART Health Pregnancy trial, currently under way in two Indian States has been looking at providing early warning signals to AASHA workers on weather events: “This has shown acceptability and is also to be expanded across seven other countries.”

TURNING CARROT WASTE INTO EDIBLE MATERIAL AGAIN

As the global population increases, the need for more sustainable and nutritious food sources becomes greater. In this context, the book *Biomass Conversion and Sustainable Biorefinery*, edited by Lubis et al. in 2024, highlights recent advances in using wasted biomass from conversion and biorefinery concepts and discusses how biomass waste and by-products can be minimised by systematic reuse. The World Health Organization has pointed out that as populations grow, it is important to find ways to convert the wasted biomass into edible products.

We use a variety of vegetables, eggs, and meat in our meals and discard the inedible parts as waste. One such vegetable we use is carrots, and while doing so, we discard its skin and bits of its head and bottom (i.e., the crown and the root tip). We also use parts of carrots to prepare sweets, where again we waste small portions as leftovers or for being inedible. An article by Gagan J. Kaur et al., titled ‘Assessment of Carrot Rejects and Wastes for Food Product and as a Biofuel’ and published in the aforementioned book, discusses this issue in detail.

It is in the same context that a paper published in December 2025 in the *Journal of Agricultural and Food Chemistry* (doi:10.1021/acs.jafc.5c11223), by an international group of authors, led by Martin Gand of the Institute of Food Chemistry at Giessen University in Germany, proposes the use of fungi to utilise carrot waste.

Fungi (the plural of fungus) are a diverse kingdom of life, distinct from plants and animals, primarily due to their unique strategies for acquiring nutrients.

Specifically, unlike plants, fungi do not perform photosynthesis. They also do not have roots with which they can grow. Instead they obtain food from external sources, but unlike animals, fungi do not ingest their food before digesting it. Instead, they release powerful enzymes into their environment to break down organic matter and then absorb the resulting nutrients from their surroundings using mycelia, a root-like structure of fungi that forms a thread-like network.

Their specialised method of eating allows them to thrive in various environments and underpins their ecological roles. They also have the remarkable ability to break down almost every organic material, including food wastes that are not digested by us.



A common example of a fungus is a mushroom, which is used to make soups, curry, pasta, and pizzas. And it is totally vegetarian and rich in vitamins and antioxidants. Mushrooms are fungi that grow using the available external material, which includes food waste. We also use mushrooms frequently in our diets, particularly when advised by nutritionists. The December 2025 study group tested more than 100 types of mushrooms from various countries and found them remarkably efficient at clearing off indigestible wastes. The researchers focused on waste that is discarded from carrots, and how fungi digest them and produce edible material. For instance, the team subsequently turned the mycelia of pink oyster mushrooms that had grown on carrot waste into “vegan patties” that could replace soy in some recipes.

While many of us use carrots in our diets (including in curries, salads, as crunchy snacks, and in sweets), chefs and dieticians advise that we need to use more mushrooms in these preparations for their health benefits. Our future food security may well depend on the transformation of food waste into high-quality proteins and vitamins by fungi.

WE NOW KNOW WHY SOME PEOPLE HAD SEVERE BLOOD CLOTS AFTER COVID SHOTS

In early 2021, as COVID-19 vaccines were being rolled out across the world, reports began to surface of a rare but alarming complication. Some people who received the shots were developing unusual blood clots. The cases were first identified in Europe and later in the U.S.

Notably, they were reported mainly among recipients of the AstraZeneca and Johnson & Johnson vaccines. The common link between those two vaccines was their design. Unlike the Pfizer and Moderna shots, which used mRNA, both the AstraZeneca and Johnson & Johnson vaccines used a modified virus to deliver DNA into the body's cells. In roughly 3 to 10 cases per million vaccinated individuals, depending on age and sex, recipients developed unusual blood clots accompanied by low platelet counts, a condition that came to be known as vaccine-induced immune thrombocytopenia and thrombosis (VITT).

Very soon, research groups started reporting that the affected patients were producing antibodies against a human protein called platelet factor 4 (PF4). PF4 plays an important role in regulating the formation of blood clots. In these patients, antibodies were binding to PF4 and forming a complex that activated platelets, driving both clot formation and the low platelet counts.

However, the puzzling thing was PF4 is a human protein. The immune system is not supposed to make antibodies against self-proteins. In extremely rare cases, autoimmune reactions do occur due to genetic susceptibilities, but here, the vaccines were designed to generate immunity against the coronavirus spike protein, not against PF4. How could this be happening?

Delivering the recipe

At its core, a vaccine is essentially a decoy. It presents the immune system with something that looks like the enemy, so the system learns to recognise and defeat the real thing later. The goal of the COVID-19 vaccines was to teach the immune system to recognise the coronavirus' spike protein. The vaccines do not contain the coronavirus itself. Instead, they deliver instructions that prompt our bodies' own cells to briefly produce a harmless piece of the virus. The immune system sees this protein, mounts a response, and forms memory cells that stand ready for future encounters.

Cells store DNA inside a structure called the nucleus. When a protein needs to be made, the cell first creates a temporary working copy called messenger RNA (mRNA). The mRNA then exits into



the main body of the cell, where special molecular machines called ribosomes make the protein from the mRNA. The mRNA is short-lived and quickly degraded.

Vaccines using mRNA such as Pfizer and Moderna took advantage of this system by delivering mRNA directly, packaged inside lipid (fat) particles. The mRNA never needed to enter the nucleus: it was immediately read in the cell body to produce the spike protein.

Delivering DNA is more complicated. DNA must enter the nucleus for the cell to make mRNA, which means crossing an additional protective barrier. Injecting naked DNA is inefficient.

Unique antibodies

Viruses, on the other hand, are experts at delivering DNA into cells. AstraZeneca and Johnson & Johnson used a harmless, genetically modified adenovirus as a courier to efficiently carry the coronavirus spike-encoding DNA into the nucleus, from where the cell's own machinery took over. Once the cell made the spike protein, it was displayed to the immune system, which began to respond. Among the first responders were B cells, the antibody-producing cells of the body. Each B cell carries on its surface a unique receptor, generated by a remarkable process of genetic reshuffling. During B-cell development, segments of DNA are randomly cut and pasted together in different combinations, creating millions of possible antibody designs. This process ensures enormous diversity even before an infection occurs.

When a B cell receptor recognises the spike protein, it is activated and begins to multiply. As it divides, its antibody genes undergo further fine-tuning through small mutations. Variants that bind the target more tightly are preferentially selected in a kind of microscopic evolutionary competition. Over days to weeks, this iterative cycle produces antibodies of increasing strength and specificity.

In theory, because this system relies on random recombination and mutation, every person's antibodies are somewhat unique, even when facing the same virus.

Same single mutation

This is generally true for most antibodies. However, a new exception to this rule has been at the core of identifying the cause behind the anti-PF4 antibodies from patients with VITT. In a paper in the *New England Journal of Medicine*, investigators reported that antibodies isolated from patients from different countries — with no known connection to one another — were remarkably similar at the molecular level. These antibodies weren't just targeting the same protein: they were built using the same antibody gene segments and carried highly similar structural features. Even more intriguing: nearly all the affected patients shared one of two versions of an antibody gene, designated IGLV3-21*02 or *03. Additionally, in the process of fine-tuning, all the patients had generated the same single mutation, which led to a small change in the protein. This change, when coupled with the variations in two versions of the antibody genes, altered the electrical charge on that part of the antibody that binds to its target.

When researchers recreated these antibodies in the lab, they showed that this small alteration made a big difference. With the change, the antibodies stuck strongly to PF4 and activated platelets. When the change was reversed, the antibodies bound weakly and were far less likely to trigger clotting.

The researchers then turned to the next question: why this reaction occurred only with vaccines that used an adenovirus as the delivery vehicle. The answer to that lay inside the virus itself.



Cast a shadow

A protein within the adenovirus, called protein VII, contains a short stretch that closely resembles part of PF4. To the immune system, the entire adenovirus particle used for delivery was foreign and antibodies were naturally generated against its components. This is a known effect of these vaccines, and in almost all cases it is harmless. In mounting this response, the immune system first produced antibodies against protein VII. But as these antibodies were being refined, that critical change, in those individuals carrying one of the two specific antibody gene variants, altered their binding properties. As a result, the antibodies were mistaking PF4 for the viral protein and were reacting against the body's own proteins instead.

For years, the mechanism behind VITT cast a shadow over adenoviral vector vaccines — a technology that has otherwise been central to global immunisation efforts. The new study has provided a clear molecular explanation by identifying protein VII to be the trigger and defining the precise antibody features involved. In so doing, the study's authors — from Australia, Canada, Germany, and the Netherlands — have paved the way for future vaccines to be engineered even more carefully, further strengthening the safety of adenoviral vectors.

SCIENTISTS REWIRE BACTERIA TO BUILD 'DESIGNER' PROTEINS ON DEMAND

Researchers have found a way to hijack the natural protein-making facilities of bacteria to manufacture specific proteins of interest. They did this by turning a 'nutrient gate' on a bacterial cell into a Trojan horse that could ferry artificial amino acids into cells to make these proteins.

The study, conducted by teams at ETH Zurich in Switzerland and the Technical University of Munich in Germany, was published in Nature.

All proteins are made of some combination of the 20 natural amino acids. In the lab, chemists can also synthesise thousands of artificial amino acids, many of which have completely new properties. For example, if an amino acid called p-azido-L-phenylalanine can be built into a protein, it would allow scientists to attach drugs to the protein at a precise spot, helping it treat some disease.

The challenge however has been to get cells' protein-making machines to use these artificial amino acids.

Idea and bottleneck

In the 1980s, Peter Schultz and his colleagues at the University of California, Berkeley, laid the foundations of incorporating artificial amino acids into proteins at specific sites. Over the years, scientists have expanded this toolkit to incorporate artificial amino acids in proteins that cells make.

Yet one problem has persisted: the struggle to get enough artificial amino acids into the cell. Most lab-made amino acids struggle to cross the cell membrane and enter the cytoplasm, where the ribosomes synthesise proteins. This is because the side chains on artificial amino acids are very water-loving whereas the core of the cell-membrane is water-repelling.

To solve this problem, scientists have used one of three approaches in the past: (i) adding large concentrations of artificial amino acids in the medium so they passively cross the cell membrane; (ii) engineering membrane-binding proteins to smuggle small peptides (short chains of amino



acids) across the cell membrane and break them down to amino acids once inside the cell; or (iii) engineering metabolic pathways within the cells to produce artificial amino acids inside the cells.

These methods showed some progress but they were still specific to certain amino acids. They couldn't be generalised.

In the new study, the researchers pinned down the exact molecule ferrying the peptides into the cell. In the absence of the transporter — the main bacterial system that normally imports small protein fragments as food — the cells almost completely lost the ability to use the artificial amino acids bound to the peptides. That was a sign this specific molecule was the smuggler. Once the peptides were inside, the cell's own protein-cutting enzymes unpacked them.

The researchers were able to confirm this: when they removed the enzymes that normally cut peptides into individual amino acids, the cell's protein production dropped. Taken together, the transporter brought the cargo in, then ordinary enzymes freed the artificial amino acid so the cell's ribosome could use it.

Across the membrane

Kathrin Lang and her colleagues at ETH Zurich started from the same idea: by attaching the artificial amino acid to a short peptide. But this group pushed the idea further in the bacteria *Escherichia coli*.

Laasya Samhita, assistant professor of biology at Ashoka University in Sonapat, explained that the group engineered an ABC transporter, a specific membrane protein that imports other proteins into the cell, using directed evolution to take up peptides carrying artificial amino acids.

The ABC transporter normally transports tripeptides (i.e. three amino acids) and tetrapeptides (four amino acids) into the cell as sources of nutrients. Dr. Lang and co. designed tripeptides and tetrapeptides in which they hid an artificial amino acid between two natural amino acids, thus causing the transporter to smuggle artificial amino acids into the cell. Once inside, the myriad peptide-cleaving enzymes inside the cell chopped them into individual amino acids, making artificial amino acids available for cells to make new proteins.

Unlike previous reports, this study engineered the transporter to alter a protein located in the space between the inner and the outer membranes of the bacterial cell. The researchers first identified residues that clamped onto the cargo. Then they prepared mutants of the transporter that would take up 10x more amounts of unconventional amino acids than an unmodified counterpart. This is double the efficiency in the uptake of artificial amino acids when compared to previous studies.

Easier to use

The findings matter because in many standard lab broths, there are already lots of natural peptides floating around, and they all compete for the same transporter, reducing how much of the cargo is smuggled inside the cell. So the researchers evolved the transporter step by step to make sure it worked even in these crowded conditions, repeatedly selecting bacterial cells that imported the artificial amino acids' peptides best. Then they built the improved version into the bacteria's genomes. The resulting system, they reported, was easier to use to produce proteins in a routine way instead of having to carefully control the media (the broths) first.



As Maximilian Fottner, Senior Scientist in Lang's group and a lead author of the study, said in a press note, the study makes it "possible to produce designer proteins containing unnatural amino acids just as efficiently as their natural counterparts". These could be genuinely multifunctional proteins, such as an antibody that carries a drug at one engineered position.

The team also showed that its approach could deliver two different artificial amino acids, allowing a single protein to carry two engineered features at different positions.

Dr. Lang and colleagues are working on designing a similar system in human cells to produce artificial human-like proteins that could be suited for several therapeutic applications. The idea could extend to import molecules other than amino acids to produce complex chemical compounds, she added.

AS PEPTIDE THERAPY BECOMES A POPULAR TREND, EXPERTS CALL FOR CAUTION

Globally, peptide therapeutics have been gaining attention in research as well as clinical practice. Studies show that more than 80 peptide-based drugs have already been approved worldwide, while over 150 peptide medicines are currently being studied in clinical trials for several medical conditions.

This trend is growing due to the promise of precision medicine and is mostly popular in wellness, fitness and anti-ageing promotions, as these medicines are seen as a targeted and 'advanced' way to improve health, appearance and performance.

How they work

Peptides are very small chains of amino acids, the basic building blocks of proteins in the body. They naturally act as messengers that regulate functions such as hormone release, metabolism, immune responses and tissue repair, said Pearly Grace Rajan, senior consultant, internal medicine, Rela Institute and Medical Centre, Chennai. Because they can bind to specific receptors, peptides can be designed to influence particular biological pathways with precision.

In therapy, these molecules are used as medicines that mimic the body's natural signals and send targeted instructions to certain cells. Since they resemble substances already produced by the body, they often act in a more targeted manner and are generally better tolerated than some conventional drugs. Studies show that peptide drugs account for nearly 9% of new medicines approved by the U.S. Food and Drug Administration in recent years.

According to Y. D. Meherprasad, senior consultant, endocrinology and preventive healthcare, MGM Healthcare, Malar, Chennai, peptide therapies are designed to influence particular biological processes in the body. Unlike some traditional medicines that may affect many systems at once, peptide-based treatments are developed to act on specific targets. Many peptide medicines are given through injections because they can be broken down in the digestive system if taken by mouth.

Dr. Rajan said interest has grown particularly in metabolic diseases such as diabetes and obesity, especially with GLP-1-based peptide drugs that help regulate blood sugar and appetite.

Peptides are explored in various fields. In oncology, they can target tumour receptors or deliver drugs directly to cancer cells. Studies suggest that oncology accounts for a significant share of peptide drug research pipelines.



In endocrinology, these therapies are used for conditions such as infertility, growth disorders and thyroid disease. Peptides that influence immune responses are also being studied for viral infections and inflammatory diseases.

In regenerative medicine, experimental peptides are being explored for their potential to stimulate tissue repair in muscles, tendons and nerves. Antoinetta Ashwini, consultant dermatologist at Apollo Hospitals, Chennai, said peptides are also being studied in dermatology, wound healing, osteoporosis and cardiovascular diseases, highlighting their expanding therapeutic potential.

According to Dr. Rajan, therapies such as insulin analogues and hormonal peptides are routinely used in clinical practice, though peptide therapies are not always recognised as a separate treatment category in many hospitals.

Risks of misuse

While several peptide drugs are already part of routine medical care, experts point out that the rising popularity of these in the biohacking, fitness and anti-ageing markets has led to over-marketing and misuse. Experts stress many peptides promoted online have limited or no human clinical trials.

Hundreds of peptide compounds remain in early-stage laboratory or pre-clinical research, and only a small proportion eventually become approved medicines.

Some products sold online as “research chemicals” may contain impurities or incorrect dosing. Because peptides can influence hormonal pathways, improper use may lead to metabolic disturbances, endocrine imbalance or cardiovascular risks. Self-injecting unapproved peptides can pose serious health risks.

Experts stress the importance of consulting a doctor about safety, research evidence and possible side effects is essential before starting such therapies.

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