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## INTERNATIONAL

### A TRUSTED MEDIATOR

“An international peace conference on Ukraine organised by the Swiss on June 15-16 will be a masterclass in understanding the art and craft of the impossible. There will be no grandstanding nor will there be a final declaration. But there will be no disappointment either because the process between now and June will be a shock absorber that, at the very least, will succeed in placing all thorny issues on the table.”

Switzerland’s initiative to bring countries to the negotiating table to discuss the Ukraine-Russia war is in keeping with its standing as a peacemaker, because it enjoys the trust of warring parties. – Switzerland has represented the US in Iran since the 1979 hostage crisis. It has a task force on the Middle East and backs a two-state solution to the Israel-Palestine question.

— The Swiss Foreign Office says that there is now sufficient support for the international conference. In addition to achieving a comprehensive, just and lasting peace for Ukraine in accordance with international law and the UN Charter, the meet aims to create a common understanding of a framework favourable to this objective and a concrete roadmap for the peace process.

— Switzerland has frozen the assets of Russian oligarchs in Swiss banks as a punishment for invading Ukraine.

— Switzerland is also planning a Ukraine Mine Action Conference in October to de-mine the country and has pledged CHF 100,000 over four years, in addition to expertise and other aid.

— Switzerland has held talks with the G7 members, EU representatives as well as Brazil, Russia, India, China and South Africa. Ethiopia and Saudi Arabia are also in the loop. Over 100 countries have agreed to attend the meeting.

— The June meeting is aimed at getting as many countries around the table as possible to discuss Russia’s frontal attack on Ukraine.

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

The 1949 Geneva Conventions are a set of international treaties that ensure that warring parties conduct themselves in a humane way with non-combatants such as civilians and medical personnel, as well as with combatants no longer actively engaged in fighting, such as prisoners of war, and wounded or sick soldiers.

— All countries are signatories to the Geneva Conventions.

### PERMANENT STATUS

As concerns about a conflict, by design or miscalculation, between Israel and Iran grow stronger, news of the United Nations Security Council resolution on granting Palestine full-member status at the UN, that was vetoed by the United States, has not received the attention it should have. The resolution, proposed by Algeria, was one more step at the world body to attempt to make good on the promise made in 1947, when the UN General Assembly originally adopted its resolution partitioning the then-mandated Palestine into two states, one Jewish and one Arab. Only Israel



became a full member of the UN in 1949. The “Question of Palestine” has been tossed around for decades, and even though the state of Palestine received permanent observer status in 2012, and temporary powers of a full member during its tenure as Chair of the G-77 and China grouping, in 2019, it has not been recognised as a full member so far. In vetoing Thursday’s UNSC resolution, that was supported by 12 of 15 UNSC members, the U.S. said that it believed Palestine should not be granted the membership through the UN process, but through “direct negotiations between the parties”. The Israeli Ambassador added that to give Palestine full member status at this time, six months after the October 7 terror attacks by Hamas, would be “the vilest reward for the vilest crimes”. It could also be argued that this is precisely the time to recognise Palestine’s long-denied right — in the aftermath of October 7, Israel has bombed Palestinians both in the Gaza Strip and the West Bank indiscriminately. That it has continued its operations despite a UNSC ceasefire resolution that even the U.S. signed on, and now threatens yet another offensive on Rafah, shows the dire need for the Palestinian state to have a much stronger voice on the multilateral stage.

The U.S. must seriously reconsider such blanket protection for the Israeli position on all issues. The contention that Palestine could only be a state through “dialogue between the parties” has a flaw: it is Israeli Prime Minister Netanyahu who declared in January that he would never accept a Palestinian state, and intended to retain “full Israeli security control over all the territory west of Jordan”. A Palestine in the UN fold would also ensure that the new state would be bound by the obligations of all UN members. It is a gross injustice to all Palestinians to conflate them with terrorist acts perpetrated by Hamas — refusing to make a distinction between combatants and non-combatants only further marginalises the pain of all victims of violence. At a time when the international order is fracturing, the U.S., as a global leader, must endeavour to build, not break consensus in order to favour one country. To do so is to run counter to the UN’s basic principle: sovereign equality of all, following instead the more primitive dictum that “might is right”.<sup>1</sup>

## STEP BACK

Iran’s massive drone and missile attack on Israel on April 14 night, in retaliation against the bombing of its embassy compound in Damascus two weeks earlier, has pushed an already volatile West Asia to the brink of an all-out war. Iran lost two of its generals, including Mohammed Reza Zahed, overseeing the Quds Force’s operations in Syria and Lebanon, and five senior officers of the Revolutionary Guards, and an Iranian response was expected. In the past, Iran has used its proxies or targeted Israeli assets in other countries in response to Israel’s attacks on its officials. But this time, Tehran’s weapons barrage from its soil targeted Israel proper, escalating tensions to levels not seen in West Asia in decades. Israel, with help from the U.S., the U.K., France and Jordan, intercepted “99%” of the Iranian projectiles. Iran says its action was in “self-defence” as a response to the embassy attack and that the matter is concluded for now. The U.S. and other allies of Israel applauded Israel’s missile defence system, and urged Prime Minister Benjamin Netanyahu to exercise restraint, avoiding a regional war. But Israel has vowed that Iran’s aggression would be met with a response.

In many ways, West Asia remains a geopolitical morass today. Israel’s brutal, illegal siege of Palestinian territories was ignored for long by regional and global players. Hamas launched a murderous attack from the blockaded Gaza Strip on October 7, 2023, leaving an open wound in Israel’s collective psyche. Since then, Israel has been carrying out a vengeful, genocidal attack of Gaza. The U.S., Israel’s most influential ally, failed to rein in Tel Aviv when it went on a rampage in Gaza and launched multiple attacks in the region, including the extremely dangerous bombing of Iran’s embassy compound. Iran, which backs Hezbollah, Hamas and the Houthis, also failed to



show any restraint. Now the region is on a cliff and a mild push is enough to trigger a calamity. Mr. Netanyahu's security and war policies have failed miserably. He could not prevent the October 7 attack. His war on Gaza has turned the enclave into a graveyard but has failed to defeat Hamas and release hostages, and his reckless bombing campaigns in the region have brought Iran and Israel to the brink of war. If an open war breaks out, both Israel and Iran can wreak havoc on each other, turning the whole region, the energy basket of the world, into a battlefield. Mr. Netanyahu should consider the remarkable performance of Israel's defence systems as a victory and stand down to avoid a regional war. If Israel does so, it would open a window of opportunity to dial down tensions in West Asia.

#### ISRAEL'S WEAPONS THAT THWARTED IRAN ATTACK

Israel's multi-layered air defence system has defended the country from a major attack, with Iran launching over 300 armed drones and long-range missiles launched towards it on April 13.

— Israel's air defence system is meant to provide multi-layered defences against a range of aerial threats, which includes aircraft, cruise and ballistic missiles as well as unmanned aerial vehicles (UAVs).

— Arrow System: Anti-ballistic missiles, capable of intercepting long-range missiles. Developed in collaboration with the US. Arrow-2 can intercept ballistic missiles within the atmosphere. Arrow-3 has the capability of intercepting missiles outside the Earth's atmosphere.

— David's Sling (or Stunner): Israel's medium-range air defence system, which can intercept cruise missiles, ballistic missiles, and aircraft. Its range is 300 kilometres.

— Iron Dome: Israel's indigenous short-range air defence system which can intercept rockets, artillery shells, and mortar bombs. Its range is 70 kilometers.

— Patriot PAC-2 and PAC-3: The US-made Patriot PAC-2 and PAC-3 are air defence systems that can intercept a range of missiles and target aircraft and drones.

— Spyder: Family of multi-range mobile air defence systems to defend large areas against aerial attack. It's an all weather system and can be activated within seconds of the target being declared hostile.

— Israel is developing the Iron Beam to intercept incoming threats with laser technology. It is yet to be fully operational.

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

— Iron Dome is a short-range, ground-to-air, air defence system that includes a radar and Tamir interceptor missiles that track and neutralise any rockets or missiles aimed at Israeli targets. It is used for countering rockets, artillery & mortars (C-RAM) as well as aircraft, helicopters and unmanned aerial vehicles. The Iron Dome was deployed in 2011.

— S-400 Triumf is an important part of India's air-defence system. S-400 Triumf is considered one of the most advanced and potent air defence systems in the world. It has the capability to protect against almost all sorts of aerial attacks, including drones, missiles, rockets and even fighter jets. The system, intended to act as a shield over a particular area, is a long-range surface-to-air missile system.



## BREACH OF CONVENTION

Ecuador's raid on April 5 at the Mexico embassy in Quito is a serious violation of the Vienna Convention on diplomatic relations on which nations operate their missions in foreign lands. The raid was to arrest Jorge David Glas, a former Vice-President in the administration of leftist and former President Rafael Correa, who has been sentenced for corruption. Mr. Correa, now living in Belgium, has also been convicted for corruption. Mr. Glas and Mr. Correa say the cases against them are politically motivated. But for Ecuador's President Daniel Noboa, the cases against the former elites were part of his larger crusade against corruption. Tensions were high between the two countries after Mr. Glas took refuge in the Mexican embassy in Quito in December, a month after Mr. Noboa took office. Last week, Ecuador declared Mexico's Ambassador Raquel Serur Smeke as persona non grata after Mexico's leftist President Andrés Manuel López Obrador's comments that were critical of Ecuador's 2023 elections. Mexico also decided to grant asylum to Mr. Glas, which angered Ecuador. It termed the decision illegal as Mr. Glas was facing cases in the country and, soon after, sent armed police officers to the embassy to arrest him, triggering a major diplomatic crisis. Mexico, which says its sovereignty has been breached, has now moved the International Court of Justice in the Netherlands, demanding the expulsion of Ecuador from the UN.

The embassy raid comes at a time when President Noboa is facing increased criticism at home over rising gang violence. He came to power promising to tackle corruption and gang violence. Last year's presidential election was marred by deadly violence when presidential candidate Fernando Villavicencio was assassinated during the campaign in Quito. Mr. Noboa says he stays committed to fighting gangs and restoring order in Ecuador's cities, but his approval rating has sunk amid growing violence, especially in the coastal city of Guayaquil, which was overrun by gangs in January. The situation is so bad in Ecuador that during the Easter weekend, the country of 18 million people saw over 100 murders. Critics say Mr. Noboa is using the diplomatic crisis with Mexico to strengthen his political fortunes. But he has merely triggered a new crisis without addressing the actual one. Ecuadorians are set to vote in a referendum next week that would give the government increased security powers to fight gang violence. The government has to get its act together in the war against organised violence, but it should do that from within the limits of domestic and international laws. Going rogue inside the embassy of a neighbouring country in the name of fighting corruption is not going to help Ecuador in tackling the myriad challenges it is facing.

## HAITI GROUPS WANT FRANCE TO REPAY BILLIONS IT CHARGED FOR 'LOSS OF COLONIAL INCOME'

France should repay billions of dollars in reparations to Haiti to cover a debt formerly enslaved people were forced to pay in return for recognising the island's independence, a coalition of civil society groups said on Thursday.

Haiti became the first in the Caribbean region to win its independence in 1804 after a revolt by enslaved people.

— France imposed harsh reparations for lost income on Haiti which was only fully repaid in 1947.

— The group of around 20 non-governmental organisations currently in Geneva for a U.N. Permanent Forum on People of African Descent (PFPAD) are seeking a new independent commission to oversee the restitution of the debt, which they refer to as a ransom.

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

**For Your Information:**

— According to the UN Human Rights Office, Gang violence in Haiti has killed over 1,500 people so far this year, including many children, while dozens have been lynched, stoned or burned alive by so-called self-defence brigades.

— India on March 21 launched 'Operation Indravati' to evacuate its citizens from the turmoil-stricken Haiti to the neighbouring Dominican Republic.

**EXPRESS VIEW: THE ASIAN EDGE**

US President Joe Biden's summits with the leaders of Japan and the Philippines last week at the White House, and China's strong reaction, suggest that some important new political and military markers are being laid down in Asia. Compared to the wars in Ukraine and Gaza — where Iran's aerial strikes on Israel have escalated tensions — a conflict in Asia between China, on the one hand, and the US and its allies in the region on the other, would perhaps be more consequential.

Today, the US and China are the world's foremost economic and military powers, and a direct confrontation between them in Asia, the world's most dynamic region, could arguably shake the world to its core. India, which has been locked in a prolonged military standoff with China in the high Himalayas over the last four years and in an expanding strategic partnership with the US, will inevitably be affected by any military confrontation between Washington and Beijing. Equally important, Delhi, unlike in the past, will have an important role in shaping the new and edgy Asian dynamic.

One of the significant outcomes of Washington's summits last week is the transformation of Japan from a passive and pacifist nation into a potential military powerhouse in Asia. Since the Second World War, Japan has stood in the military shadow of the US as a protectorate.

In Washington, Prime Minister Fumio Kishida has signed off on agreements to integrate the military command structures of the two countries and contribute actively — with a growing defence budget, a more powerful missile arsenal, and the joint development and production of weapons with the US — in deterring Chinese military coercion and promoting a rules-based Indo-Pacific order.

In the first-ever trilateral summit with the US and the Philippines, Kishida agreed to join hands with Biden in defending the territorial sovereignty of the Philippines, which has been under relentless pressure from the PLA in the South China Sea. Biden and Kishida also outlined an agenda of economic cooperation with Manila — especially in infrastructure development — as an alternative to the Chinese Belt and Road Initiative.

China, unsurprisingly, has warned the US against "bloc politics" in Asia and the attempt to create a "mini Nato" in the east. Beijing is, of course, trying to counter American efforts at isolating it in Asia. In the last few days, it hosted the Russian foreign minister, Sergei Lavrov, received the former president of Taiwan, Ma Ying-jeou, and welcomed the leaders of Vietnam and the president-elect of Indonesia, Prabowo Subianto. Beijing is determined to defeat the region's economic decoupling from China and a consolidation of its neighbours into a countervailing coalition backed by the US.

Some in Delhi believe Beijing may be ready for a fresh outreach to prevent India from getting closer to the US and boosting an Asian coalition against China. Delhi has long nurtured these illusions, only to be disappointed every time. Seeing real progress on restoring peace and



tranquillity on the border, disturbed rudely by the PLA in the summer of 2020, must remain a precondition before any Indian exploration of a political reset with China.

## GETTING AROUND BOYCOTT

Sanjay K Bhardwaj writes – Bangladesh’s location and India’s role in its independence have established the “India factor” as a powerful discourse in its domestic politics. The emergence of an “India Out” campaign on social media that advocates the boycott of Indian products with hashtags such as #IndiaOut, #BoycottIndia comes as a reaction to that.

From Maulana Abdul Hamid Khan Bhashani to the present-day opposition alliance led by Bangladesh Nationalist Party (BNP), there have been instances of anti-India stand throughout Bangladesh’s history. Bhashani was pro-China and believed in a model of Islamic socialism. He criticised Sheikh Mujibur Rahman for making Bangladesh a satellite of India and tried to forge a coalition of the right and left extremists against the Awami League (AL). The BNP, which represents the right-of-centre forces, has an orthodox social constituency inspired by Bhashani. The party is remotely controlled by its acting chairperson Tarique Rahman, Khaleda Zia’s son, from London where he is in exile.

Bangladesh is expected to become a middle-income country by 2041 while it is on track to graduate from the Least Developed Countries list in 2026.

According to the World Bank, Indian exports to Bangladesh were valued around \$324 million in 1991. This, interestingly, increased to \$868 million in 1996 during the first tenure of BNP.

Similarly during its second tenure, in 2001, the export from India was around \$1.06 billion, which increased to \$1.66 billion in 2006.

India is Bangladesh’s second-largest import source, with a staggering \$13.69 billion worth of goods entering the Bangladeshi market in 2021-22.

A dominant theme in India’s exports to Bangladesh is the supply chain for the textile industry. Bangladesh’s garment manufacturing sector, a key driver of its economic growth, relies heavily on raw materials and intermediate goods from India. In 2022, non-retail pure cotton yarn and raw cotton (20.1 per cent of total import) were among India’s top imports.

India also supplies Bangladesh Refined Petroleum which is crucial for powering industries and transportation.

Other significant imports include pharmaceuticals, chemicals, and machinery, highlighting the multifaceted nature of this trade relationship.

Recently, India exported 50,000 tonnes of onion to Bangladesh ahead of Ramzan, an exception to the export ban on the crop in December 2023. This is apart from essential commodities such as garlic, coconut oil and spices.

There have also been instances of informal trade between the two countries, crucial in stabilising inflation in Bangladesh.

India is a major supplier of construction materials to Bangladesh for infrastructure development.



The loss-incurring Bangladesh Road Transport Corporation (BRTC) is turning profit-making with the supply of new tracks from India.

An intensification of the India Out campaign stands to derail all of these as well as the on-going negotiations on the Comprehensive Economic Partnership Agreement (CEPA) between India and Bangladesh.

Both India and China have high stakes in the outcome and credibility of the election process, not only because of their robust economic ties with Bangladesh, but also in the light of their wider rivalry in the region. How Dhaka manages the partnership expectations from the two Asian giants is key, and will be watched internationally.

The support from India in Bangladesh's war of liberation in 1971 contrasts with China's backing for Pakistan. Despite this history, pragmatism shapes Bangladesh's current ties with these neighbours.

Bilateral trade between India and Bangladesh exceeded \$15 billion in 2021-22. India recognizes Bangladesh as a vital eastern buffer, and provides critical support in ports and power grid access, essential for national growth. Historical ties and geographical proximity foster a symbiotic trade relationship.

On the other hand, Bangladesh's two-way trade with China exceeded \$25 billion in 2022. Bangladesh aligns strategically with China, which is helping transform its landscape through mega projects. Chinese investments in BRI-financed infrastructure projects have surpassed \$10 billion.

#### **The intersection of geopolitics and economics**

In the pursuit of achieving developed nation status by 2041, Bangladesh has strategically harnessed economic and technological strengths of both India and China, balancing ties amid evolving dynamics. It has granted port access to both countries, fostering modernization in Mongla port under the banners of the BRI and Bangladesh-China-India-Myanmar Corridor (BCIM). A similar cooperative enhancement for Pyra port was undertaken, but India backed out due to the public-private partnership being granted to a Chinese company.

Bangladesh's Indo-Pacific outlook draft underscores engagement with regional and global stakeholders for human security, connectivity, and the blue economy, while steering clear of geopolitical tensions.

Bangladesh imports Indian electricity which currently stands at 1,160 MW, while enabling about \$450 million of Chinese investments into 1,845 MW domestic power generation as of 2021. The surging demand for electricity has necessitated an expansion of supply, and concurrent energy deals with both countries advance converging industrialization interests.

As a smaller neighbour reconciling the interests of regional giants, Bangladesh has simultaneously advanced national agency and cooperation with countries that are each other's rivals.





## NATION

### EXPRESS VIEW ON MARYAM NAWAZ'S OLIVE BRANCH TO INDIA: PUNJABIYAT DIPLOMACY

Speaking to around 3,000 Sikh pilgrims at Kartarpur Sahib, Maryam Nawaz, the Chief Minister of Punjab and heir apparent of three-time Pakistan Prime Minister and PML(N) supremo Nawaz Sharif extended an olive branch to India. She invoked the linguistic and cultural similarity among Punjabis on both sides of the border.

Pakistan's Punjab is the country's largest province and much of its political, military and cultural elite is Punjabi. Maryam spoke of friendship with India, religious tolerance and celebrating Eid, Baisakhi and Holi. Quoting her father, she said, "don't fight wars with neighbours... open the doors of friendship... open the doors of your hearts". Behind Maryam's emotional appeal are the hard economic and geopolitical realities confronting Pakistan. Less than a month ago, Pakistan's Foreign Minister Muhammed Ishaq Dar said that "Pakistani businessmen want trade with India" and that his government was "seriously considering" the matter.

Rawalpindi and Islamabad are also faced with increasingly restive Western borders with both Afghanistan and Iran. The Army, too, may want a measure of stability on the eastern front.

Maryam's outreach is of a piece with earlier attempts at improving bilateral ties. As Chief Minister of Punjab in 2013, Shehbaz Sharif (now PM) made it a point to visit Punjab on his visit to India. In 1999, Parkash Singh Badal, then CM of Punjab in India, visited Lahore with Prime Minister Atal Bihari Vajpayee. There have also been attempts at deeper cross-border economic and energy cooperation. As recently as 2014 —after Shehbaz's visit in 2013 — Pakistan evinced interest in importing power from India. In India, GAIL was receptive to the idea of supplying natural gas across the Wagah border from Jalandhar.

Unfortunately, the cooperation did not materialise, not the least because of the Pakistan Army scuppering them. The PML(N), Nawaz Sharif in particular, has often faced resistance from Rawalpindi because of its overtures to India. Now, though, things appear to be different. Maryam's statement, for example, would not have been possible without at least tacit support from the Army — there is no doubt that the current government in Pakistan is supported by the Army.

A major stumbling block in bilateral ties, especially after the August 5, 2019 abrogation of Article 370, has been Pakistan's intransigence on the "Kashmir issue". The new government seems to be continuing that trend, with President Asif Ali Zardari calling for the restoration of special status this week. PM Shehbaz Sharif too has made similar statements, as has the Army. However, the fact also is that the relationship has been stalled because of the "core concerns" on both sides — terrorism for India and Kashmir for Pakistan. The current moment may provide an opening to pick low-hanging diplomatic fruits, especially restoring trade ties. What is needed over the next few weeks is quiet back channel diplomacy, especially of the kind that led to the 2021 ceasefire along the Line of Control — this ceasefire has largely held. Behind-the-scenes conversations can lay the ground for the next Indian government after the Lok Sabha polls to move the needle forward.

### SIACHEN: 40 YEARS OF OP MEGHDOOT

"The land is so barren and the passes so high that only the best of friends and fiercest of enemies come by" — reads a Ladakhi saying at Kumar post on the Siachen Glacier located at an altitude of

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



15,632 feet. The saying captures the conflict on the icy glacier between India and Pakistan. April 13, 2024 marks four decades since the Indian Army pre-empted Pakistan and occupied the glacier on the Saltoro ridge, overlooking the Nubra valley in the Karakoram ranges. Extreme weather is the biggest enemy on the glacier. Around 1,150 soldiers have lost their lives, majority of them to the vagaries of extreme weather.

### **Conflicting claims**

Siachen, in Balti language means “land of roses” — ‘Sia’ is a kind of rose species that grows in the region and ‘Chen’ means “in abundance”. However, it is known for being the world’s highest and coldest battlefield. It sits at a very strategic location with Pakistan on the left and China on the right.

Siachen is a legacy of the Partition between India and Pakistan. While the Line of Control (LoC) was delineated and accepted by both sides upto NJ-9842 as part of the 1972 Simla agreement, the glacier itself was left unmarked. India claims the area based on the Jammu and Kashmir Accession Agreement of 1947 and the Karachi Agreement of 1949, which define the ceasefire line beyond NJ-9842 as running “Northwards to the glaciers”. On the other hand, Pakistan interprets it as ‘North-Eastwards’ to claim the area beyond the Saltoro Ridge and beyond Siachen as its own. This would give Pakistan direct connectivity to China as well as strategic oversight over the Ladakh region and the crucial Leh-Srinagar highway, posing a serious threat to India.

### **The genesis of Operation Meghdoot**

In the 1970s and 1980s, Pakistan began allowing foreign mountaineering expeditions, resorting to cartographic aggression, to add credence to its claims. Following intelligence inputs of imminent military action by Pakistan in early 1984, India moved to pre-empt it.

Mountaineering expeditions led by Col. Narinder ‘Bull’ Kumar to the Siachen glacier and Saltoro range as Commandant of the High Altitude Warfare School (HAWS) in the early 1980s helped immensely in the planning process leading up to Operation Meghdoot. Based on these reports, the Indian Army launched ‘Operation Meghdoot’ on April 13, 1984 to capture the 76.4 km-long glacier. This was accomplished after a platoon of 4 Kumaon led by then Captain Sanjay Kulkarni (retired as Lt Gen) planted the Indian flag at Bilafond La at an altitude of 18,000 feet. Personnel from the Ladakh Scouts were also deployed via Cheetah helicopters by the Indian Air Force (IAF).

Although the operation began in 1984, IAF helicopters were already operating in the glacier with the first landing of a Cheetah helicopter in October 1978. Additionally, in preparation for the operation, IAF’s tactical and strategic airlifters, An-12s, An-32s and IL-76s transported stores and troops and air-dropped supplies to high altitude airfields, from where Mi-8, Mi-17, Cheetah and Chetak helicopters ferried men and material to the icy heights on the glacier, far above the limits helicopters were meant to be operated. Soon, about 300-odd troops were positioned on the strategically important peaks and passes of the glacier, the IAF recounted in a statement on Operation Meghdoot.

In June 1987, Indian troops captured the Quaid post at 21,153-feet under Operation Rajiv. The post was later renamed the Bana top, in honour of then Naib Subedar Bana Singh (later Subedar Major and Hony Captain) from 8-Jammu and Kashmir Light Infantry (JAK LI) who was also conferred the Param Vir Chakra, India’s highest wartime gallantry award for leading the attack in an impossible situation by scaling a 1,500 foot ice wall.



From 1984 to 2003, both sides were exchanging fire regularly. The guns finally fell silent in 2003 after the ceasefire agreement along the LoC and the 110km long Actual Ground Position Line (AGPL) in Siachen. While the LoC has flared up on multiple occasions, ceasefire along the AGPL has held since. Operation Meghdoot continues to this day, becoming the longest continuing operation in the world.

The actual Army posts are located at heights of 18,000 feet and above, with the Bana post being the highest on the glacier and Indira Col the highest point. At 18,000-19,000 feet, Indian and Pakistani posts face each other; however, at 20,000 feet and beyond, it is only India.

#### AN EXPERT EXPLAINS: THE STRATEGIC IMPORTANCE OF ANDAMAN AND NICOBAR ISLANDS

Various geopolitical events leading to the realisation of the critical importance of ocean power, the rapid enhancement in the capabilities of the Chinese PLA Navy, and the transformation of India's Look East policy into a robust Act East policy have brought new thrust to developing Indian island territories in general and the Andaman and Nicobar groups in particular.

— The Andaman and Nicobar (A&N Islands) islands are located 700 nautical miles (1,300 km) southeast of the Indian mainland. The Malacca Strait, the main waterway that connects the Indian Ocean to the Pacific, is less than a day's steaming from Port Blair.

— Biswajit Dasgupta writes "The A&N Islands should be the first line of offence against any attempt from the East to undermine India's maritime security. While some effort was made to leverage this locational advantage with the Andaman and Nicobar Command (ANC) being constituted as a tri-services command in 2001, subsequent efforts have been grossly inadequate."

#### **Reasons for the Slow Pace of Infrastructural Development in the A&N Islands:**

— Distance from the mainland and difficulties in developing infrastructure; Complex procedures for obtaining environmental clearances.; Significant coordination challenges among ministries, departments, and agencies.

#### **Key areas to be focused on for the development of the A&N Islands:**

— Development of separate airfields with long runways for monitoring and patrolling of sea areas by aircraft and surface platforms.

— Work on the Galathea Bay (Great Nicobar Island) transshipment port must be expedited.

— Maritime services such as repair and logistics must be developed for international and Indian shipping.

— Road networks, high-speed inter-island ferry services, and a seaplane terminal.

— Forest and environmental clearances must be accorded with minimum red tape.

— Planned habitation of uninhabited islands should be considered by providing incentives.

— Eco-friendly entrepreneurial efforts could be encouraged.

— Ports and fuel storages



**For Your Information:**

— Andaman and Nicobar islands share four of India’s international maritime zone delimitations with Myanmar, Thailand, Indonesia, and Bangladesh. They also give India substantial ocean space under the United Nations Conference on the Laws of the Sea (UNCLOS) in terms of exclusive economic zone and continental shelf.

**ALLOWING CURATIVE PLEA, HOW SUPREME COURT PUSHES THE ENVELOPE**

Setting aside the 2017 arbitral award that required the Delhi Metro Rail Corporation (DMRC) to pay nearly Rs 8000 crore to Anil Ambani-owned Reliance Infrastructure, the Supreme Court has expanded the scope of its “extraordinary powers” to intervene beyond constitutionally prescribed processes. A curative writ petition, that the Supreme Court has invoked in reviving the 2019 Delhi High Court judgment that partially set aside the Delhi Metro arbitration award, is a sparingly used judicial innovation to correct a “grave miscarriage of justice”.

Constitutionally, a final ruling of the Supreme Court can only be questioned in a review petition, that, too, on narrow procedural grounds.

— In 2002, in *Rupa Hurra v Ashok Hurra*, the SC allowed curative writs as the last resort to correct judgments that are “oppressive to judicial conscience and would cause perpetuation of irremediable injustice.”

— However, exercising curative jurisdiction in a commercial case pushes the envelope and raises questions on the finality of a ruling of the highest court in the country.

— In November 2021, the Supreme Court had dismissed a review petition against its judgment delivered a month before on the Delhi Metro Arbitration. In doing so, a bench of Justices Nageswara Rao and Ravindra Bhat had underlined the need for judicial restraint in interfering with arbitral awards.

A curative writ petition as a layer of appeal against a Supreme Court decision is not prescribed in the Constitution. It is a judicial innovation, designed for correcting “grave injustices” in a ruling of the country’s top court.

— The SC first articulated the concept of a curative writ in *Rupa Ashok Hurra vs Ashok Hurra* (2002). If there was a significant miscarriage of justice due to a final decision of the Supreme Court, could the court still correct it? On the one hand was the issue of finality and closure to a case, and on the other hand was the substantive question of rendering justice in its true sense. In answering this question, the SC said that its “concern for rendering justice in a cause is not less important than the principle of finality of its judgment”.

— However, curative writs are sparingly used. There are narrow, mostly procedural grounds that permit the filing of a curative writ. A claim must be made that principles of natural justice were not followed — for example, that a party was not heard, or that a judge was biased, or had a conflict of interest. These petitions need to be approved by a senior advocate designated by the court.

— Curative writs are filed mostly in death penalty cases. The SC in the *Yakub Memon* case (2015) and the *Delhi gang rape convicts* case (2020) dismissed curative writs challenging death sentences. In 2023, in the *Bhopal gas tragedy* case, the SC refused to exercise its curative powers to enhance the compensation provided to victims that was deemed grossly inadequate.



## CAN'T BLAME PARTNER FOR ABETTING SUICIDE IF RELATIONSHIP FAILS: HC

The Delhi High Court has observed that a person cannot be held accountable for abetting the suicide of a partner who ends their life due to “love failure”.

“For the wrong decision taken by a man of weak or frail mentality, another person cannot be blamed for having abetted their suicide,” Justice Amit Mahajan said while granting pre-arrest bail to two persons.

“If a lover commits suicide due to love failure, if a student commits suicide because of his poor performance in an examination, or if a client commits suicide because his case is dismissed, the lady, examiner, lawyer, respectively, cannot be held to have abetted the suicide,” the judge added.

The court’s order on Tuesday came while granting anticipatory bail to a woman and her male friend, who are facing charges of allegedly instigating a man to take his own life in 2023.

The father of the deceased had filed a police complaint stating that the woman was in a romantic relationship with his son, but had told him that she was marrying her friend.

In a note, the deceased had blamed the woman and her friend for his drastic step.

The judge said that the note “only expressed a state of anguish of the deceased towards the [anticipatory bail] applicants, but it cannot be inferred that they had any intention that led the deceased to die by suicide”.

## EXPRESS VIEW ON ‘LOVE JIHAD’ LAW: PLAYING TO ANXIETIES

The fact that consenting adults should require the state’s approval — and protection — for their relationship with a person of their choice is telling in itself. But a report in this paper shows how in UP, the interpretation of a provision of the state’s anti-conversion law has led to contrasting outcomes in orders by the Allahabad High Court in matters related to inter-faith live-in relationships.

Since August last year, different benches of the Court have dismissed pleas for police protection for at least 12 interfaith couples in live-in relationships, stating the criminalising of such relationships under UP’s Prohibition of Unlawful Conversion of Religion Act, 2021. In three other cases, including one from early last year, conditional protection was granted. The law has already been challenged in the Supreme Court along with similar laws from several other states but the arbitrary nature of interpretation has implications for those who find themselves at its receiving end.

In February 2020, in response to a written question in the Lok Sabha, then Union Minister of State for Home G Kishan Reddy had said, “The term ‘love jihad’ is not defined under the extant laws. No such case of “love jihad” has been reported by any of the central agencies”. The Constitution empowers citizens with the freedom to practise and propagate any religion, he had added. Yet, the bogey of “love jihad” continues to stoke paranoia. It puts interfaith relationships under intense scrutiny from family, society and state machinery in a manner discordant with the notion of diversity that guides Indian democracy.

The anxieties around such relationships have led to the formation of “love jihad” laws in several states, including Gujarat, Haryana, Himachal Pradesh, Jharkhand, Madhya Pradesh, Uttarakhand,



and Uttar Pradesh. Worse, prejudice has put individual rights enshrined in the Constitution under constant threat of violence, infantilised women and undermined their independence and agency.

In circumstances where relationships have to overcome such insurmountable odds, often, the only hope of justice rests with the judiciary. Arbitrary interpretations of an already narrow law set a precedent for other restrictive explications and put young people at grievous risk. The challenge before the court, therefore, is to ensure that it is consistent in upholding the individual's constitutional rights. It also falls upon the Supreme Court to speed up the process of hearing the petitions pending before it on the matter so that the autonomy, dignity and privacy of individuals are not imperilled at the altar of a bad-faith law.

#### EXPRESS VIEW ON CENTRE'S PANEL OF QUEER RIGHTS: BETTER LATE THAN NEVER

Given the tenor of conservatism that has generally guided its views on LGBTQIA+ rights, including its opposition to the legalisation of same-sex marriage in the country, the Centre's notification of a committee "to examine the various issues relating to the queer community", honouring its undertaking to the Supreme Court (SC) in October last year, is welcome. Chaired by the Cabinet Secretary, the mandate of the six-member committee is to ensure that the systemic discrimination and violence faced by the community in accessing social welfare schemes and services is mitigated. The work that lies ahead is arduous. The panel will need to consult widely with LGBTQIA+ rights groups and other experts to draw up a roadmap for a more equitable society.

In its landmark 3:2 judgment last year that stopped short of granting constitutional validity to same sex marriage, SC had shifted the onus on to the legislature to ensure that protective safeguards are woven into the framework of rights and that "a bouquet of entitlements which flow from an abiding relationship of this kind" is recognised. The entitlements iterated by the apex court included the right to be treated as a family for banking and medical purposes, jail visitations and last rites, among others. The Court also mentioned "legal consequences such as succession rights, maintenance, financial benefits such as under the Income Tax Act 1961, rights flowing from employment such as gratuity and family pension and insurance".

The reading down of the provisions of Article 377 by the SC stands out as a seminal moment but the progress on queer rights in the country has been chequered at the best of times. Legislative intentions have often appeared to be out of sync with ground realities — a survey conducted by Pew Research between June 2022 and September 2023, for instance, showed that 53 per cent adults were in favour of legalising same-sex marriages. It is also telling that the community's rights barely feature as election issues. This year, only the Congress manifesto speaks of a "law to recognise civil unions between couples belonging to the LGBTQIA+ community" and the CPI(M)'s of "legal recognition and protection to same-sex couples similar to marriage-'civil union'/same-sex partnerships". The BJP has promised insurance coverage to transgender individuals under the Ayushman Bharat scheme and wider access to Garima Grehs. These are progressive aspirations, but they remain in the tentativeness of the future. The immediate work ahead of the Centre's panel is to seize the momentum set in motion by the apex court and to assure the community that their concerns will be heard — and addressed.

#### TOP COURT ASKS COAST GUARD TO REINDUCT WOMAN OFFICER

Observing that the judiciary has to be the "flag bearer" and march with the nation, the Supreme Court on Monday pulled up the Indian Coast Guard (ICG) over the treatment meted out to a



woman, who was discharged as a short service commission officer in 2021, and ordered the maritime force to re-induct her.

Coming down hard on the ICG for resisting grant of permanent commission to women officers, a bench headed by Chief justice D Y Chandradud referred to the top court's verdicts on grant of permanent commission to women officers in the Army, Air Force and Navy and said that the discrimination has to end.

**Key takeaways:**

- The bench directed the ICG to re-induct Priyanka Tyagi to the post which she occupied on the date of discharge from the service in 2023. Priyanka Tyagi has sought permanent commission to eligible women short service commission officers of the ICG.
- The bench did not agree with Attorney General R Venkataramani's contention that comparing ICG to the Army, Navy and the Air Force was misconceived.
- "We have already given our judgments in matters related to Permanent Commission in the Army, Navy and the Air Force. The Indian Coast Guard unfortunately continues to remain an outlier... Look at the resistance for a woman joining the Coast Guard," the CJI observed.
- The attorney general said he was not opposed to gender equality and was only referring to the facts of the case and the preparedness of the force to go about the changes.
- The ICG had told the bench that the present recruitment rules related to short service commission officers specifically provide that they cannot seek permanent commission.

**For Your Information:**

- A permanent commission means a career until the age of retirement. Whereas, Short Service Commission jobs are for a few years.
- In some SSCs, a few officers get to opt for permanent commissions based on available vacancies.
- The Indian Coast Guard is a multi-mission organization, conducting round-the-year real-life operations at sea. Nodal Ministry: Ministry of Defence.
- 'Secretary, Ministry of Defence vs. Babita Puniya': In a landmark verdict on February 17, 2020, the top court had directed that women officers in the Army be granted permanent commission, rejecting the Centre's stand on their "physiological limitations" as being based on "sex stereotypes" and "gender discrimination against women".

**THE TREND IN CLIMATE CHANGE JURISPRUDENCE**

**The story so far:**

In a recent judgment, the Supreme Court ruled that citizens have a "right against the adverse effects of climate change." The Court was giving its verdict in a case that raised concerns over multiple deaths of the Great Indian Bustard due to solar power transmission lines against India's obligation to meet its emission reduction and increase its energy capacity through non-fossil fuel sources.



### What is the context?

In recent years, one of the factors linked to the decline in the population of the Great Indian Bustard, an endangered species, are power lines in Rajasthan and Gujarat, which host several, large solar parks. The concern was that the birds collided against the overhead transmission lines. Environmentalists petitioned the Supreme Court in 2019, pleading that all overhead lines, existing and prospective, be shifted underground. Private and public power companies, supported by the Centre's Ministry of New and Renewable Energy (MNRE), contended that shifting all overhead lines underground would be expensive and impractical, and would significantly hike the cost of solar power, undermining India's commitment to green growth. The Court had constituted a committee of experts in April 2021 to determine which transmission lines ought to go underground and which ones could remain overhead. In its latest judgment, the Court has continued to task an expert committee with overseeing the electrification but quite emphatically stressed that underground electrification — as the government and power-developers have argued — would hinder India's road to solar electrification.

### What does the judgment say on human rights and climate change?

The Court notes that the Indian government has taken multiple steps through legislation as well mission-led programmes to address climate change. The Wild Life (Protection) Act 1972, the Water (Prevention and Control of Pollution) Act 1974, the Air (Prevention and Control of Pollution) Act 1981, the Environment (Protection) Act 1986, the National Green Tribunal Act 2010, were among those referenced in the judgment; the National Solar Mission, the National Mission for Enhanced Energy Efficiency and, the National Mission for a Green India were also mentioned. "Despite governmental policy and rules and regulations recognising the adverse effects of climate change and seeking to combat it, there is no single or umbrella legislation in India which relates to climate change and the attendant concerns. However, this does not mean that the people of India do not have a right against the adverse effects of climate change," the Court noted.

Despite constitutional guarantees that give citizens equality before the law and right to life and personal liberty, it was now necessary, in the Court's view, to explicitly link the impact of climate change as something which impedes these rights of liberty, life and equality. "This is perhaps because this right (against climate change) and the right to a clean environment are two sides of the same coin. As the havoc caused by climate change increases year by year, it becomes necessary to articulate this as a distinct right. It is recognised by Articles 14 and 21," the judgment notes. The Court also said that if vulnerable communities were affected, say by coastal erosion, land degradation, or if people were made additionally vulnerable to disease, agricultural losses, storms and flooding — all indirectly linked to climate change — then rights under these Articles (14 and 21) would be violated, further necessitating an explicit link between climate change and rights.

### Are there international precedents?

The link between climate change and human rights has grown stronger since the Paris Agreement of 2015. The preamble of the Agreement had references to "human rights."

In a 2023 research paper, Doreen Lustig and Ilil Gabison of Tel Aviv University highlighted that there was a growing convergence between the fields of international human rights law (IHRL) and climate change. Several reports of UN human rights bodies and Human Rights Council resolutions are now drawing a link between rights and climate change. In 2005, Sheila Watt-Cloutier, a Canadian-Inuk activist, in her capacity as chair of the Inuit Circumpolar Conference (now known





as the Inuit Circumpolar Council), petitioned the Inter-American Commission on Human Rights (IACHR) to get relief for human rights violations resulting from the impacts of climate change. This was among the first explicit links translating the impact of the climate crisis into human rights language. Scholars also argue that the framing of climate change as affecting future generations and endangering their right to a liveable planet follows from the link to human rights. That is how the climate activism, for instance, of Greta Thunberg and her 'school strikes for climate', must be understood.

#### **What are the implications of such a ruling?**

Supreme Court judgments on environmental matters have often significantly altered public discourse and governmental action. For instance, decisions in the M.C. Mehta versus Union of India, the Godavarman Thirumulpad cases have been the foundation of subsequent environmental action. In the current case of the Great Indian Bustard too, the ruling has come with the Court underlining the necessity for expanding electricity production for solar energy sources. While this is state-backed, India has also underlined its right at international fora to continue to rely on coal plants and fossil fuels. Whether this will be seen by Indians as the government failing to protect them against the effects of climate change remains to be seen.

### **EXPRESS VIEW ON INDIAN AMBASSADOR'S REJOINDER TO IRISH TIMES EDITORIAL: UNDIPLOMATIC**

OF course, Indian diplomats stationed overseas should showcase the values of Indian democracy, stand by them, defend them when they are under attack. A newspaper editorial, howsoever critical it may be, is hardly an attack that needs an Ambassador to get so riled up. But skins are thin these days and Indian Foreign Service officer and Ambassador to Ireland Akhilesh Mishra did get riled up. And in what looks like a zeal to appear more loyal than professional, he shot off a rejoinder that makes him look prickly, not exactly the mature voice representing a global power. The Irish Times editorial, headlined 'Modi tightens his grip', predicts a "comfortable third term" for Prime Minister Narendra Modi and argues that his "undoubted personal popularity and economic success... will play the major part in his victory." It then goes on to say that he has "leant heavily on a widespread crackdown on free speech and opposition parties" and refers to the role played by Central agencies and the arrest of Arvind Kejriwal.

Mishra's rejoinder lists key achievements of the government and praises the PM's "impeccable personal character" and "unprecedented popularity." It's right to underline that "Hindus of India possess incredible diversity of thought, ways of life and political beliefs, covering the entire spectrum from extreme left to extreme right..." and "regularly vote to power non-Hindu nationalists." Where Mishra blurs a professional line is when, to make his case, he attributes Modi's popularity to "the fight against the deeply entrenched ecosystem of corruption (created by the 55-year rule, including the first 30 years by a single dynastic party in India)". He uses brackets but the punctuation isn't the point. This makes his rejoinder a political rebuttal rather than a note from a diplomat.

In a constitutional democracy, bureaucrats are meant to be above the political fray, and represent, serve and defend the country, not a government. This is why the All-India Services (Conduct) Rules unequivocally state, "Every member of the Service shall maintain... political neutrality." Mishra's swipe at the Congress, unfortunately, betrays a broader trend across ideological lines and governments. In West Bengal, the transfer of senior IPS officers and even a chief secretary became politicised. Earlier this year, officials at the Union Finance Ministry helped prepare a



“White Paper” on the economy and referred to “our government.” Bureaucrats, of course, should be free to express their personal opinion — that, indeed, enriches public discourse. But in the discharge of their duties, they must remember they work for the Government of India — not the party in power. That’s not an academic distinction, it’s what safeguards the institutions and the Constitution. On X, the handle of the Indian Embassy in Ireland is an active one, showcasing events that reflect the richness of India — from a Tamil festival to a Kerala tourism briefing. Surely, Ambassador Mishra doesn’t need to sound like a party activist to make a diplomatic point.

## WHEN ELECTION COMMISSION OVERCAME ‘IMPOSSIBLE’ CHALLENGE, HELD SECOND LOK SABHA ELECTION ON TIME

If India’s first Lok Sabha election was, among other things, an act of faith, the second was a race against time.

### Administrative challenges

The elections of 1957 presented formidable administrative challenges. The Delimitation Commission was constituted in 1952 to redraw constituencies based on data from the 1951 Census. Also, the States Reorganisation Commission led by Justice Fazl Ali had made its recommendations in 1955 (which were implemented in 1956) — thus, the boundaries of states too, were different from those during the first Lok Sabha election (1951-52).

In 1956, it looked as though the election could be delayed. On May 11 that year, Prime Minister Jawaharlal Nehru told Lok Sabha, “So far as the Election Commission is concerned, they are always preparing for the next step. The difficulty comes in when the new constituencies will have to be formed because of new states and for other reasons. So far as the government are concerned, they are anxious to have the elections as usual in March next (1957).”

The “difficulty” arising out of the reorganisation of states was very real and big. India had 27 states in 1951-52 — nine Part-A states (provinces of British India ruled by the Governor and with an elected state legislature), eight Part-B states (former princely states or groups of princely states governed by a Rajpramukh), and 10 Part-C states (provinces of British India governed by a Chief Commissioner who was appointed by the President, and some princely states).

In 1957, there were 14 states and six Union Territories. Elections were to be held for 494 Lok Sabha seats in 403 constituencies, including 91 seats with double members (one general category, the other from a Scheduled Caste/ Tribe), and 3,102 state Assembly seats in 2,518 constituencies (584 had double members).

There was another tight deadline to meet. Elections to the posts of President and Vice-President had to be held before May 13, 1957. This meant the Lok Sabha elections would have to be completed by the end of March 1957 — any delay would require an amendment to the Constitution.

Chief Election Commissioner Sukumar Sen wrote of the challenge and the EC’s determination to meet it: “Influential sections of public opinion were more or less convinced that it was an impossible task and that the elections would have to be postponed by a year or so and...life of the legislatures extended accordingly by an amendment of the Constitution...”

“The Commission considered that it would be setting up a very bad precedent...if, merely because of certain temporary though formidable difficulties, the country was forced to amend its



Constitution and extend the terms of the very first legislative bodies that had been set up under it.”

So, in the spring of 1957, the EC achieved the “impossible”: elections were held across the country in just over a fortnight.

### **The political landscape**

As in 1952, the Congress was far ahead of the field. The Communist Party of India (CPI) and Praja Socialist Party (PSP) were the only major forces in the Opposition. The Bharatiya Jana Sangh (BJS), precursor of the BJP, was still trying to come into its own.

By 1957, leaders who might have mounted a political challenge to Nehru were no longer alive — Dr Syama Prasad Mookerjee had passed away in 1953, and Dr B R Ambedkar in 1956. The Gandhian J B Kripalani had merged his KMPP with Jayaprakash Narayan’s Socialist Party to form the PSP and take on the Congress. However, JP later moved away from active politics and aligned with Vinoba Bhave to campaign for his Bhoodan Movement, a voluntary land reform movement, and Sarvodaya programme for the uplift of all classes in society.

Just before the election, Nehru faced a setback when Chakravarti Rajagopalachari, the last Governor General of India and a former Chief Minister of Madras, left to form the Indian National Democratic Congress. The party, however, failed to make an impact in the election, and Rajaji later formed the Swatantra Party.

### **‘Modern’ ballot papers**

A total 19.36 crore voters — excluding Jammu and Kashmir, Andamans, and Lakshadweep’s Minicoy Island — were enrolled to vote between February 24 and March 14, 1957. Some constituencies in the hilly regions of Punjab and Himachal Pradesh, which was a Union Territory at the time, were cut off by snow, and could vote only in June and July. A total 9.21 crore women were enrolled to vote, and in the rural areas, separate polling stations were set up for women in purdah.

Some 9.26 lakh polling personnel, 2.73 lakh policemen, and 1.68 lakh chowkidars were deployed for the election. More than 21 lakh ballot boxes were used — but since some boxes were recycled from 1951-52, only 4.56 lakh new boxes had to be arranged, reveals the 1957 Election Commission report.

In the first Lok Sabha election, voters were given ballot papers the size of a Re 1 currency note, and asked to drop it in the designated ballot box for the candidate of their choice. That system changed in 1957 — a new type of ballot paper was introduced, which remained in use until the arrival of electronic voting machines (EVMs).

On August 22, 1956, Minister for Law and Minority Affairs Charu Chandra Biswas told Lok Sabha: “The Election Commission has under consideration the question of introduction of a system of voting called the marking system... A ballot paper will bear the names (and, if possible, symbols) of all candidates. The elector will secretly place a mark against the name of the candidate of his choice.”

The new ballot paper contained a serial number and the name of each candidate, along with their party affiliation and election symbol. The Security Press in Nashik printed 57.93 crore ballot papers for the 1957 election.



Like in 1951-52, voters participated with enthusiasm. The EC report reveals that at a polling station in Bihar, an old woman demanded to see “Pandit Nehru” before voting. At a polling station in UP, a few voters refused to vote for anyone but “Gandhiji” and “Nehruji”. In Madras, a voter insisted on voting for the CEC, saying, “I want to vote for Shri Sukumar Sen only and not for the candidate of any of the parties. All these parties have been harassing me (with propaganda).”

However, the overall polling percentage in 1957 fell to 47.54% from the 51.15% in the first Lok Sabha election. The highest turnout (75.68 %) was recorded in Kottayam in Kerala, while Kangra, which was then in Punjab, had the lowest turnout (16.94 %).

#### **A sweep for Congress**

Despite the rumblings within the Congress, the party ended up stronger after the election, with its vote share going up from 44.99% in 1952 to 47.78% in 1957. The party won 371 seats, seven more than in 1952. The CPI came a distant second with 27 seats — nine in Kerala and six in West Bengal. Of the 45 women who contested, 22 won.

Nehru won his second straight election from Phulpur. After losing from Bombay in 1952, Morarji Desai won from Surat, Lal Bahadur Shastri from Allahabad (now Prayagraj) and Feroze Gandhi from Rae Bareilly.

Atal Bihari Vajpayee was the BJS candidate from Mathura, Lucknow, and Balrampur, but won only in Balrampur. Acharya Kripalani (PSP) won from Sitamarhi, while his wife Sucheta won from New Delhi as a Congress nominee. Vijayaraje Scindia, who would later play a key role in the BJS-BJP, won as a Congress candidate from Guna.

Prominent among the losers were V V Giri, who would later become President — he came in third at the two-member Parvathipuram seat. Ram Manohar Lohia contested from Chandauli as an Independent and lost.

On April 17, 1957, Nehru, 68, took oath as Prime Minister. His popularity was undiminished, and the Congress under him was the strongest it had been since Independence. But this, 1957-1962, would be his last full term as Prime Minister.

### **HOW JAWAHARLAL NEHRU WON A THIRD TERM IN THE 1962 ELECTIONS, DESPITE GROWING CHALLENGES**

By the time the elections of 1962 came around, the Election Commission of India (ECI) had finetuned many of its procedures. The election saw the highest turnout of voters until then — and even though the Congress won decisively, the first clear instances of political criticism of the party became visible.

This happened despite Prime Minister Jawaharlal Nehru in his second term having overseen the successful liberation of Goa, Daman, and Diu in a military operation that ended more than 400 years of Portuguese rule over these territories.

#### **New CEC, new challenges**

The first Chief Election Commissioner (CEC) Sukumar Sen retired in 1958, and was succeeded by KVK Sundaram. The big change in the 1962 election was the abolition of two-member seats, a system that was intended to provide representation to the general category in certain reserved (SC/ST) seats.

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



In the first two elections, some constituencies — including Nehru's Phulpur and Feroze Gandhi's Rae Bareilly — sent two members to Lok Sabha. (There was even a three-member seat in West Bengal in the first Lok Sabha.) In 1957, Congress heavyweight and the future President of India V V Giri came third in Parvathipuram, Andhra Pradesh, one of the two-member seats, behind two Scheduled Tribe (ST) candidates. Around the country, SC/ST candidates were elected at nine single-member 'general' seats.

Giri challenged the election of the second ST candidate, Dippala Suri Dora, in the Supreme Court, but got no relief. As the demand for restricting SC/ST reservation to single-member constituencies gained momentum, Parliament passed The Two-Member Constituencies (Abolition) Act, 1961.

A second change in the 1962 election came as a consequence of the creation of the new states of Gujarat and Maharashtra in 1960, and the Union Territories of Goa, Daman and Diu, and Dadra and Nagar Haveli in 1961, and the accompanying realignment of administrative boundaries.

### **10-day vote, 3-week count**

Ten days, from February 16-25, is all it took for almost 21 crore Indians to vote for India's third Lok Sabha.

A total 1,985 candidates contested the election, in which 55.43% of the 21.63 crore electors cast their votes — well above the 47.54% turnout in the 1957 election. The best turnout in 1962 was in Nagapattinam (80.66%); the worst in Bhanjanagar, Orissa (12.04%).

Votes were cast for 387 general, 76 SC, and 31 ST seats in Lok Sabha, and 3,121 seats in state Assemblies, including 693 reserved seats. The national parties were, besides the Congress, the Communist Party of India (CPI), Praja Socialist Party (PSP), and the Bharatiya Jana Sangh (BJS), which was the precursor to today's BJP.

The practice of putting indelible ink on the voter's left forefinger, seen in the first two elections, continued in 1962 as well. But an experiment with issuing photo identity cards was abandoned after a test before a byelection to the Calcutta South-West Lok Sabha seat was not successful.

The counting of votes took longer than the polling — from February 25 to March 18, 1962. There were demands for recounts at the Gonda and Balrampur seats in UP. Congress candidates ultimately won both seats by small margins. The new Lok Sabha was constituted on April 2, 1962, after giving the old House time to wrap up essential pending work.

### **Third term for PM Nehru**

By the middle of Nehru's second term, the first criticisms of the Congress could be heard clearly. At the 1959 AICC session in Nagpur, Chaudhary Charan Singh, who was still in the Congress then, criticised the party's Cooperative Farming Resolution, which proposed the pooling of individual land holdings without provisions for mechanisation of agriculture.

Just before the election, Chakravarti Rajagopalachari, the last Governor-General of India, merged his Indian National Democratic Congress with some smaller groups in Bihar and Himachal Pradesh to form the Swatantra Party, which was recognised as a state party in six states.

However, none of the Opposition parties managed to dent the Congress electorally in 1962. The party won 361 seats in Lok Sabha; the next biggest party in the House was CPI with 29, followed by BJS with 14. Thirty-five women were elected.



In the Assembly elections, the Congress returned to power in all states except Kerala. Barring Madhya Pradesh and Rajasthan, it got clear majorities everywhere.

Ram Manohar Lohia of the Socialist Party lost to Nehru in Phulpur. Vijayaraje Scindia, who contested on a Congress ticket, won in Gwalior.

Among the Opposition leaders, J B Kripalani contested from Bombay City (North) as an Independent and lost. Atal Bihari Vajpayee of the BJS lost both in Balrampur and Lucknow, but was subsequently elected to Rajya Sabha. Vajpayee's party colleague Balraj Madhok lost in New Delhi.

After the election, at its national executive in Kota, Rajasthan, on May 24, 1962, the BJS would pass a resolution accusing central and state ministers of "heavily misusing" government machinery during the elections. The party would demand that governments at the Centre and in states should resign three months ahead of every election so that a level playing field could be ensured.

### **China war, other problems**

On April 10, 1962, Nehru, then 73, took oath for a third term as Prime Minister. He had been greatly disturbed by what he saw as the articulation of separatist voices during the election campaign, and had told Lok Sabha on March 19 that he had been "shocked beyond measure at what the opponents of the Congress did".

"...All the tendencies which have been so obvious in this election, caste tendency, communal tendencies and the like which are harmful and which disintegrate the country have to be met as far as possible unitedly... Elections upset our thinking apparatus and put passions in control of us and of others... If it is war, it will be war but it will not be accepted. When I find that not only the people who talk about them but others encouraging such parties and asking people to vote for them, it shows that something has gone wrong in somebody's thinking completely..." he said.

Nehru was speaking about the Dravida Munnetra Kazhagam (DMK), which had run a radical campaign and won seven seats in Madras and emerged as a major force there. A year earlier, in 1961, the National Integration Council (NIC) had been established to find solutions to "the evils of communalism, casteism, regionalism, linguism and narrow-mindedness".

Besides the rising tides of linguist nationalism and subregional aspirations, Nehru's government also grappled with food shortages and general social unrest. Then, on October 20, 1962, China invaded, dealing a body blow to Nehru's trustful foreign policy doctrine of Hindi-Chini bhai-bhai. Although China declared a unilateral ceasefire after a month, Nehru and the Congress could never recover from the setback.

Of the 10 bypolls held between the 1962 Lok Sabha election and July 1963, the Congress could win just four — Lohia entered Lok Sabha from Farrukhabad, and Kripalani from Amroha. In August 1963, Nehru's government faced its first no-confidence motion.

The gradual consolidation of Opposition parties had an impact in multiple states in 1967. But Nehru was not alive to see the decline of his party. After serving for 16 years and 286 days — the longest prime ministerial tenure in India so far — Nehru passed away following a fatal heart attack on May 27, 1964, in New Delhi.



## THE STORY OF PARTY SYMBOLS IN INDIAN ELECTIONS, AND HOW CONGRESS GOT THE HAND, BJP THE LOTUS

Election symbols are a critical component of elections. They are a party's identity, and help voters recognise candidates. When parties split, a battle is fought for its election symbol. What is the history of the iconic election symbols of the country's oldest and largest parties, the Congress' 'Hand', and the BJP's 'Lotus'?

### **Beginning of India's election symbols**

Before the first Lok Sabha election of 1951-52, the Election Commission of India (ECI) realised that election symbols were critical in a country where the literacy rate was less than 20%. It was decided that symbols should be familiar and easily recognisable, and should not show any object with a religious or sentimental association, such as cow, temple, the National Flag, spinning wheel, etc.

Parties that were recognised as national and state parties, were offered choices from a list of 26 symbols approved by the ECI.

### **How are election symbols allotted in India?**

At present, Rules 5 and 10 of the Conduct of Elections Rules, 1961 deal with symbols. Rule 5 states that the ECI shall "specify the symbols that may be chosen by candidates at elections in parliamentary or assembly constituencies and the restrictions to which their choice shall be subject".

The Election Symbols (Reservation and Allotment) Order, 1968 defines a "reserved symbol" as one that is "reserved for a recognised political party for exclusive allotment to [its] contesting candidates". A "free symbol" is "a symbol other than a reserved symbol".

Election symbols, Election Commission of India, poll symbols, Janata Party poll symbol, Congress poll symbol, Hand, Lotus, Lotus election symbol history, Lotus evolution, free and fair elections, indian express news Before the first Lok Sabha election of 1951-52, the Election Commission of India (ECI) realised that election symbols were critical in a country where the literacy rate was less than 20%.

Free symbols are allotted to independents and unrecognised registered parties based on their request and preferences.

### **Symbol of the Congress**

Ahead of the first election, the preferred symbol of the Indian National Congress was 'Plough with Bullocks', followed by 'Congress Flag with Charkha'. However, on August 17, 1951, the Congress was allotted 'Two Bulls (later 'Bullocks') with Yoke on'. The 'Human Hand', the Congress symbol today, was allotted to the All India Forward Bloc (Ruiker Group).

In 1969, the Congress split into the Congress (O) and Congress (R), where 'O', headed by S Nijalingappa, stood for 'Organisation' and 'R', headed by Jagjivan Ram, for 'Requisitionists'. On January 11, 1971, the ECI decided that Jagjivan Ram's Congress, which was supported by Indira Gandhi, was the real Congress.



But the Supreme Court stayed the ECI's order and ruled that neither group would be entitled to use 'Two Bulls with Yoke on'. On January 25, 1971, the ECI allotted 'Charkha being Plied by Woman' to the Nijalingappa group, and 'Calf and Cow' to the Jagjivan Ram/ Indira group.

Several leaders objected, saying 'Calf and Cow' or 'Gomaata' was related to religious sentiments, but the ECI overruled these objections.

#### **Calf and Cow to Hand**

In the late Seventies, the Indira-Jagjivan Ram Congress split again, and the anti-Indira group was led by Devaraj Urs and K Brahmananda Reddy. On January 2, 1978, Indira was elected president of the Indian National Congress, and she approached ECI to retain 'Calf and Cow'. After the ECI said no, Indira moved the SC, which refused to interfere and dismissed the petition as withdrawn.

On February 2, 1978, the ECI recognised the Indira group as a national party named Indian National Congress (I) and allotted it the symbol 'Hand'. In 1979, the ECI froze the symbol 'Calf and Cow', and later recognised the Devraj Urs faction as a national party named Indian National Congress (U) with the symbol 'Charkha'.

The ECI subsequently decided that Congress (I) was in fact the real Indian National Congress. From the 1984 Lok Sabha election onward, Congress (I) became Congress, with the 'Hand' election symbol.

#### **BJS to BJP, Lamp to Lotus**

The Bharatiya Jana Sangh (BJS) was allotted 'Deepak' ('Lamp') as its election symbol on September 7, 1951. The BJS continued to use 'Lamp' until it was informally merged with the Janata Party before the 1977 election. Janata was born as an amalgam of four national parties and some unrecognised parties.

But the Janata Party very soon suffered a series of splits. On April 6, 1980, a group of leaders who had earlier been with the BJS met in Delhi and declared Atal Bihari Vajpayee as their leader. Both groups claimed to be the real Janata; however, the ECI ruled that neither could use the name until its final decision.

On April 24, 1980, the ECI froze the Janata Party's symbol 'Haldhar within Wheel', and recognised Vajpayee's group as a national party under the name of Bharatiya Janata Party (BJP), and allotted it the symbol 'Lotus'.

Besides 'Haldhar within Wheel', the Janata splits resulted in the freezing of four other symbols — 'Lamp' (of the erstwhile BJS), 'Tree' (of the erstwhile Socialist Party), 'Woman plying Charkha' (of the Congress-O), and 'Farmer Ploughing the Field' (of the Janata Party-S).

### **DECODE POLITICS: WHY EC HAS SCRAPPED 'FORM M' FOR KASHMIRI PANDIT VOTERS IN JAMMU, UDHAMPUR**

In a notification, the Election Commission (EC) said on Thursday that Kashmiri Pandit migrants staying in Jammu and Udhampur districts need not fill the "Form M" for casting their votes in their native parliamentary constituencies in the Valley. The EC said they would now be "mapped" with special polling stations to be set up in the zones that they are residing in currently.





### **What is “Form M”?**

It was introduced during the 1996 J&K Assembly elections to enable Kashmiri Pandit migrants to vote in their constituencies in the Valley even while staying in exile. The form is filled by the heads of Kashmiri Pandit migrant families staying at different places in Jammu and elsewhere in the country.

After the announcement of any Assembly or Lok Sabha elections, the eligible migrant voter could collect the “Form M” from the office of Relief Commissioner or their respective zonal officer, fill it, and get it signed by a gazetted officer. They were required to affix their photographs and declare their native place in the Valley before migration and also mention the details of adult members in their families who were eligible as voters.

### **Objective of “Form M”**

After the outbreak of militancy in Kashmir in 1989, thousands of Kashmiri Pandit families left their native places in Kashmir and migrated to safer places in Jammu and other locations.

However, even after their migration, they continued to register themselves as voters in their native places in the Valley, hoping to return there in the event of a favourable situation.

As these migrants were from different places in the Valley, the EC introduced “Form M” to identify them area-wise, enabling them to cast a vote for their native constituencies from the places they were residing in.

### **Has there been any opposition to it?**

Yes. Kashmiri Pandit migrants have long been pressing for simplification of their voting process. Even after filling the “Form M”, there was no guarantee that they could cast a vote on the polling day in the absence of any intimation about the acceptance or rejection of the form well in advance. There have also been instances when a migrant staying in one zone was listed as a voter at a polling station set up in another zone.

These issues have reflected in the number of Kashmiri Pandit migrants availing this facility. During the 2019 Lok Sabha polls, only 13,537 of the total nearly one lakh migrant voters had cast their vote.

### **What change EC has made now?**

The EC has now begun mapping Kashmiri Pandit migrant voters in Jammu and Udhampur districts and said it would set up special polling stations falling in their zones. According to the new scheme, separate constituency-wise voter lists will be issued for migrant voters residing in each zone so that they cast their vote at the polling booth set up there on polling day for their respective constituencies.

### **Significance of Kashmiri migrant voters**

A total of 1.13 lakh Kashmiri Pandit migrant voters have been registered in three Lok Sabha constituencies of Kashmir – Srinagar, Anantnag and Baramulla. With these constituencies registering less than 20% polling during the 2019 elections, these Kashmiri Pandit migrant voters can be a decisive factor in the elections. Last time, more than 80% of the migrant votes are estimated to have gone to the BJP.



### Other migrants

Kashmiri Pandit migrants staying in Delhi and elsewhere in the country, who are lesser in numbers, will still be required to fill up the “Form M”. However, the EC has also eased the process of filling up these forms by allowing self-attestation instead of the earlier required certification by gazetted officers.

## EXPERTS EXPLAIN: LAST 72 HOURS MOST CRUCIAL DURING ELECTIONS, HERE’S WHAT HAPPENS BEHIND THE SCENES

Votes in the first phase of the Lok Sabha election will be cast on April 19. The most critical time in the election process includes the last day of the campaign period (72 hours before the poll), the non-campaign period (the last 48 hours), and the poll day. Candidates are afforded the opportunity to make a final impression on the electorate, while the period of “election silence” allows voters to take a reflective pause.

Several behind-the-scenes logistical and operational activities ensure that the elections are conducted smoothly. The scale of the exercise is immense — around 97 crore voters, 10.5 lakh polling stations, 1.5 crore polling officials and security staff, 55 lakh EVMs, and 4 lakh vehicles across the country — and timely and meticulous planning, rigorous implementation, and close supervision are essential to ensure free, fair, participative, and peaceful elections.

The election machinery is especially sensitive to violations and legal challenges, and geared towards disseminating accurate information and preventing the spread of misinformation and disinformation.

### The last 72 hours

The monitoring of campaign expenditure includes the last check of candidates’ expenditure registers and strengthening the inspection teams. There are Flying Squads (FSs), Static Surveillance Teams (SSTs), Excise Teams, and a 24X7 District Control Room.

The FSs operate in three shifts round the clock in each Assembly constituency, swiftly responding to complaints. They can seize cash or items intended as bribes, document evidence, and initiate legal proceedings.

SSTs are stationed at critical locations, and focus on intercepting illicit goods such as liquor and large amounts of cash to deter malpractices and prevent undue influence.

The adherence of political parties and candidates to the Model Code of Conduct is strictly monitored to prevent any activity that can disrupt societal harmony or unduly influence voters.

The District Election Officers (DEOs) collaborate with senior police officials to develop strategies to manage any potential disturbances during the critical 72 hours leading up to the close of the voting.

This includes the sealing of borders to keep out anti-social and disruptive elements.

A concentrated effort is made to educate voters on the polling process, including timings, locations, valid identification documents, and the importance of ethical voting. The final assessment is made of the Assured Minimum Facilities (AMFs) at the polling stations, which



include the provision of drinking water, shade, wheelchairs, clean toilets, etc for the comfort and convenience of voters.

#### **The last 48 hours**

Under Section 126 of the Representation of the People Act, 1951, the election campaign halts during the “silent period” that lasts for 48 hours ending with the conclusion of the poll.

The District Magistrate issues orders under Section 144 of the CrPC, 1973, prohibiting unlawful assemblies, public meetings, and the use of loudspeakers, and limiting gatherings to no more than five persons. Door-to-door campaigning is still permitted. Political functionaries and party workers who are not voters of the constituency are expected to leave once campaigning ends.

This period also sees “area domination” activities by the Central Armed Police Forces, a restriction on opinion polls, and political advertisements through electronic and social media, and the enforcement of a ban on the sale of liquor.

To ensure transparency at critical polling stations, measures including the deployment of micro-observers, video and still cameras, webcasting, and CCTV surveillance are implemented.

On the day before polling, randomly-formed polling parties are dispatched to the polling stations with electronic voting machines (EVMs) and other election materials. They move with security personnel in designated vehicles. Reserve EVMs are allocated to the Sector Officers.

There is coordination with other departments — for example, Health for emergency medical assistance, telecoms and discoms for uninterrupted services, and the print media and All India Radio to disseminate election-related information to the public. Candidates are informed of all activities from time to time.

#### **The Polling Day**

The general restrictions on the poll day include using only one vehicle for the candidates, their agents, and party workers. However, using these vehicles to ferry voters to polling stations is considered a corrupt practice under Section 133 of the RP Act, attracting penal action under Section 123(5) of the Act. The use of mobile phones (except by officers on duty), canvassing, using campaign-related posters or banners, and loudspeakers or megaphones within 100 metres of a polling station are banned.

Under Section 135(B) of the RP Act, employees are given a paid holiday on the poll date. Only persons entitled under Rule 49D of the Conduct of Election Rules, 1961, are allowed inside polling stations, including polling officers, public servants on duty in connection with the election, a child in arms accompanying an elector, etc.

Booth Level Officers are stationed at Voter Assistance Booths to help voters locate their details in the alphabetical electoral roll locator for the polling station. Before polling commences, the Presiding Officer must demonstrate a marked copy of the Electoral Roll and the EVMs, and conduct a mock poll before the candidates’ polling agents.

During the poll, polling officials monitor activities such as voter queues, voter identification, applying indelible ink, and ensuring the swift replacement of malfunctioning EVMs. A complaint-handling mechanism functions at the block level to address all complaints and queries within 30 minutes.



After the polls close, EVMs are sealed and securely transported to the reception centre under security. The strong rooms where EVMs are stored have robust security measures, including a triple-tier guard, a double lock system, and round-the-clock CCTV monitoring. Facilities are provided for candidates to monitor the strong room.

## REFORMS NEEDED IN THE VOTING PROCESS

### The story so far:

The Supreme Court has decided to hear petitions seeking 100% cross-verification of the Voter Verifiable Paper Audit Trail (VVPAT) slips with the vote count as per Electronic Voting Machines (EVMs).

### What is the history of voting process?

In the first two general elections of 1952 and 1957, a separate box was placed for each candidate with their election symbol. Voters had to drop a blank ballot paper into the box of the candidate whom they wanted to vote for. Thereafter from the third election, the ballot paper with names of candidate and their symbols was introduced with voters putting a stamp on the candidate of their choice.

The EVM was introduced on a trial basis in 1982 in the Assembly constituency of Paravur in Kerala. They were deployed in all booths during the Assembly elections of Tamil Nadu, Kerala, Puducherry and West Bengal in 2001. The Supreme Court in various judgments has upheld the validity of using EVMs in elections. In the 2004 general elections to the Lok Sabha, EVMs were used in all 543 constituencies. In *Subramanian Swamy versus Election Commission of India* (2013), the Supreme Court ruled that a paper trail is an indispensable requirement for free and fair elections. The 2019 elections had EVMs backed with 100% VVPAT in all constituencies.

### What are international practices?

Many western democracies continue to have paper ballots for their elections. Countries like England, France, The Netherlands and the U.S. have discontinued the use of EVMs, for national or federal elections, after trials in the last two decades. In Germany, the Supreme Court of the country declared the use of EVMs in elections as unconstitutional in 2009. Some countries like Brazil, however, use EVMs for their elections. Among our neighbours, Pakistan does not use EVMs. Bangladesh experimented in a few constituencies in 2018 but reverted to paper ballots for the general elections in 2024.

### What are the features of EVMs?

EVMs bring significant benefits to the electoral process. First, the EVM has virtually eradicated booth capturing by limiting the rate of vote casting to four votes a minute and thus significantly increasing the time required for stuffing false votes. Second, invalid votes that were a bane of paper ballots and also a bone of contention during counting process have been eliminated through EVMs. Third, considering the size of our electorate which is close to one billion, the use of EVMs is eco-friendly as it reduces the consumption of paper. Finally, it provides administrative convenience for the polling officers on the day of the poll and has made the counting process faster and error-free. There are mechanisms to uphold the integrity of EVM and VVPAT process. These include random allocation of EVMs to booths before polls; conduct of a mock poll to display the correctness of EVMs and VVPAT before commencement of the actual poll; and the serial number



of EVMs along with total votes polled shared with agents of candidates to verify the same at the time of counting of votes.

Despite its advantages, there have been doubts raised about the functioning of EVMs by various political parties and civil society activists from time to time. The most repeated allegation is that EVMs are susceptible to hacking as it is an electronic device. The ECI has time and again clarified that it is a standalone device like a calculator with no connectivity to any external device and hence free from any kind of external hack. The sample size for matching of the EVM count with VVPAT slips at present is five per assembly constituency/segment. This is not based on any scientific criteria and may fail to detect defective EVMs during counting. The present process also allows for booth-wise polling behaviour to be identified by various parties that can result in profiling and intimidation.

#### **What can be the way forward?**

In a transparent democracy, each citizen must be able to comprehend and verify the steps in the election process without any special technical knowledge. The 100% use of VVPAT has enabled the voters to verify that their votes are 'recorded as cast'. However, few additional steps need to be adopted to make the entire process more robust and ensure that the votes are 'counted as recorded'. 100% match of EVM count with VVPAT slips would be unscientific and cumbersome. The sample for matching of EVM count and VVPAT slips should be decided in a scientific manner by dividing each State into large regions as suggested by experts. In case of even a single error, the VVPAT slips should be counted fully for the concerned region and form the basis for results. This would instil a statistically significant confidence in the counting process. Further, in order to provide a degree of cover for voters at the booth level, 'totaliser' machines can be introduced that would aggregate votes in 15-20 EVMs before revealing the candidate-wise count.

## HOW DID THE LAW ON DISCLOSURE OF ASSETS EVOLVE?

#### **The story so far:**

Two recent developments have brought under focus the disclosure norms that candidates are expected to comply with in election law. One relates to reports that the BJP candidate in the Thiruvananthapuram Lok Sabha constituency, Rajeev Chandrasekhar, had allegedly failed to report all the assets he owns in the mandatory affidavit accompanying his nomination papers. Another report was about the Supreme Court noting that not every little detail needs to be disclosed, as candidates also have their right to privacy.

#### **What is the law related to disclosure?**

The requirement that prospective candidates will have to disclose their criminal antecedents, if any, their educational qualifications and their assets and liabilities, including those of their spouses and dependants, arose from a landmark Supreme Court judgment on May 2, 2002. The court ruled that the voters' right to information in a democracy is part of the citizens' right to express their opinion through their vote.

In June 2002, the ECI issued the rules to give effect to the judgment. However, the Central government of the day sought to curtail the scope of these disclosures by an ordinance amending the Representation of the People Act, 1951, in August 2002. Later, it was replaced by an Act. The amendments introduced Sections 33A (concerning disclosure of pending criminal cases), Section 33B (which effectively nullified the ECI's notification by saying no disclosure other than those



prescribed in the Act is required) and Section 125A (penalty for failure to disclose or false disclosure). The Ordinance and, thereafter, the amending Act were challenged in court. The Supreme Court on March 13, 2003, struck down Section 33B and restored the disclosure requirements regarding assets and liabilities and educational qualifications. The ECI issued revised instructions and the format for disclosure based on the judgment.

#### **What are the consequences of any omission?**

Section 125A of the RPA, 1951, prescribes a six-month prison term, or a fine, or both, for any candidate's failure to disclose the required information, or giving false information or concealing such information.

Besides this provision for prosecution, any omission or false information could be a ground to challenge a candidate's election in the High Court. Among the grounds available to a court to invalidate an election, two are relevant here. Under Section 100, an election can be declared void if there is "improper acceptance of any nomination" or "any non-compliance with the provisions of the Constitution or of this Act or of any rules or orders made under this Act." It is possible for an unsuccessful candidate to question the acceptance of the nomination of the ultimate winner on the ground of concealment or furnishing of false information, as well as raise the possible violation of any of the statutory disclosure requirements.

#### **What is the latest court ruling?**

This case concerned the election of Karikho Kri, an independent candidate who won a seat in the Arunachal Pradesh Assembly in 2019. His election was challenged by the Congress candidate Nuney Tayang on the ground that Mr. Kri had not disclosed some moveable assets in the names of his wife and children. The Itanagar Bench of the High Court of Assam, Nagaland, Mizoram and Arunachal Pradesh accepted the allegations and declared Mr. Kri's election void. It found that his nomination had been improperly accepted as he had failed to disclose three vehicles (sold some years before, but not yet registered in the name of the buyers) and had not submitted a 'No Dues' certificate for government accommodation he had enjoyed during an earlier stint as MLA (2009-14).

The Supreme Court set aside the High Court's judgment on the ground that the non-disclosure was not of a substantial nature warranting rejection of his nomination; nor did it amount to non-compliance with the law as it did not materially affect the outcome of the election.

#### **What is the takeaway from the verdict?**

Rejecting the contention that the voter's right to know all particulars is absolute, the Supreme Court said there was no need for a candidate to lay bare his entire life to the electorate. It is not necessary to declare every item of moveable property, unless it is of such value as to be sizeable in itself, or will reflect upon his lifestyle and thus be of interest to the voter. However, the court cautioned that there cannot be a straitjacket rule on this, and what omission is of a substantial character or will affect the outcome will depend on the facts of each case.



## AS AAMIR KHAN'S FAKE VIDEO ON CONGRESS GOES VIRAL, HOW TO SPOT DISINFORMATION AMID ELECTIONS

The first phase of voting for the Lok Sabha elections is on Friday (April 19). Over the past few weeks, there has been a deluge of disinformation and manipulated media online.

Two videos of actor Aamir Khan went viral this week. Both were manipulated versions of a promo for Khan's popular TV show, *Satyamev Jayate*. In one, Khan appears to be explicitly supporting the Congress party, while in the other, he is seen speaking about *nyay* (justice) — a key Congress talking point in recent years, and the title of its manifesto (*Nyay Patra* or 'Document [for] Justice').

Recently, actor Ranveer Singh too was a victim of deepfake technology, when a manipulated video of him criticising Prime Minister Narendra Modi on the issues of unemployment and inflation was widely shared. In the original clip, however, Ranveer was actually praising the prime minister.

Here is how these deepfake videos are made — and how you can spot them

### Voice swap technology

*itisaar.ai*, an AI detection tool developed in collaboration with IIT Jodhpur, shows that these videos were generated using 'voice swap' technology.

As the name suggests, this refers to the process of using an AI algorithm to either alter or mimic an individual's voice. The technology also allows the creators to change the characteristics of a voice, such as accent, tone, pitch, and speech patterns to make the videos more realistic.

Currently, there are several easy-to-use AI voice swap tools available for free. The creator has to simply upload or record the audio sample that she wants to replace, and then customise the settings to make the uploaded sample sound as realistic as possible.

### How to spot deepfakes

While it is not easy to spot well-produced deepfakes, here are some tips to keep in mind while scrolling through social media, especially during election time.

**Verify sources:** Be cautious of audio or video content from unfamiliar sources, especially if it seems controversial or sensational. Verify the authenticity of any suspicious post by cross-referencing with reliable sources, and trustworthy media organisations.

**Listen for anomalies:** Deepfake audio may exhibit subtle anomalies, such as the voice's unnatural tenor, slightly robotic speech, and irregular pauses. Listen closely for these telltale signs of manipulated or synthetic speech.

**Scrutinise visual content:** Deepfake audio is often accompanied by manipulated visual content, such as altered video footage. Check both audio and visuals elements for any discrepancies or inconsistencies. For instance, if lips do not move in sync with the speech, the video you are seeing may be manipulated.

**Stay informed:** Staying updated about day-to-day news and events is key to recognising the risks associated with deepfakes. It is harder to fool people who have general awareness of what is happening around them.



Use AI voice detectors: A few AI detectors, such as Optic's 'AI or Not' are available to be used for free. You can upload any suspicious audio or video onto such detectors, which will tell you the authenticity of any content.

## IN THE FRAY

In a country the size and diversity of India, voter choices can be a bundle of contradictions that require careful parsing to unpack and understand. On the one hand, the CSDS-Lokniti pre-poll survey 2024 findings, that unemployment and price rise are the issues of most concern to prospective voters, come as no surprise. In a country with a large youth population and a relatively low per capita income, the lack of sufficient jobs and the persistence of high inflation should be major issues of concern. The survey also reveals that more than half the respondents felt that corruption had increased in the last five years. In its 10-year term, the performance of the Narendra Modi-led Bharatiya Janata Party (BJP) government on the economic front has been rather mediocre, with little being done to lower unemployment even as it has pursued policies that have significantly benefited the elite over the masses. Even as the BJP seeks to emphasise issues such as the inauguration of the Ram temple and Hindutva at high decibel level in its campaigning, the survey reveals that these two issues do not have a high resonance in comparison to livelihood concerns. But the survey also shows that the BJP and its allies have a comfortable 12 percentage point lead over the INDIA bloc, with "leadership" and socio-cultural issues determining higher preference for the ruling party.

The dichotomy in voter perceptions on key issues versus their possible choices provides comfort and concern to both the alliances and the other parties in the fray. While the BJP has engaged in bluster about winning nearly 400 of the 543 seats in Parliament, the chief concerns related to the economy suggest that the party is not having it as easy as it did in 2019, despite the gap in vote shares as expressed in the survey. As for the Opposition, harping on an alternative agenda related to the economy and livelihood concerns could provide it with an opening to narrow down the gap in vote shares in the run-up to the actual hustings. While the poll survey had not focused on State-level dynamics, recent Assembly elections have shown a sharpening of the north-south political divide, with the BJP unable to sway the south on socio-cultural issues as much as it is able to do so in the Hindi heartland and other areas. That close to half the respondents laid out livelihood issues as key concerns should provide an opportunity for the political messaging across the country to be a contest of ideas — about which political group offers the best deal in addressing these concerns. Lastly, it is alarming that nearly 58% of the respondents had lost some or a great amount of trust in the Election Commission of India. The institution must address concerns about the voting process, while asserting its independence in order to regain trust.

## RBI SURVEY SHOWS WHY LIVELIHOOD ISSUES ARE IN FOCUS IN 2024 POLLS

The findings of the Reserve Bank of India (RBI)'s consumer confidence survey, conducted in March in urban areas, on concerns regarding livelihood are similar to the findings of the CSDS-Lokniti pre-poll survey, published in these pages.

One major conclusion of the CSDS-Lokniti pre-poll survey was that while the NDA has an edge over the Opposition in the run up to the Lok Sabha elections, issues such as inflation, unemployment, and falling income levels are major election issues this time.

In the pre-poll survey, 32% of the respondents chose 'increasing unemployment' as the reason for not electing the incumbent government. The other two reasons in the list of top three reasons

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





were 'price rise' (cited by 20% of the respondents) and 'falling income' (cited by 11% of them). 'Price rise' and 'increasing unemployment' also featured as the top two 'least popular initiatives' of the government.

The RBI's latest survey, conducted between March 2 and 1st 8 among 6,083 respondents across 19 major cities, shows similar concerns among urban consumers.

The share of respondents in the RBI survey who said employment opportunities have improved and those who said they have worsened compared to a year-ago period. Close to 38% of the respondents said the job outlook has worsened. A similar share said it has improved compared to a year-ago period. The rest said the outlook remained the same.

These numbers should be read keeping in mind that the comparisons are from a low-base (the year-ago period), when consumer confidence was still recovering after the pandemic. While confidence about job opportunities are now closer to pre-pandemic levels, close to one-third are pessimistic about employment scenarios. These findings concur with the results of the pre-poll survey.

The share of respondents in the RBI survey who said income levels have improved and those who said they have worsened compared to a year-ago period. Confidence about income levels is still recovering since the pandemic. Close to 22% of the respondents said income levels have decreased compared to a year-ago. This is higher than the 10% in 2014-15. Close to 27% said income levels have increased. The rest, close to 50%, said income levels have remained the same. This is a pain point given that the prices of commodities are increasing every year.

The share of respondents in the RBI survey who said the price levels of commodities have improved and those who said they have worsened compared to a year-ago period. Close to 90% of the respondents continued to say price levels of items have increased compared to the year before. A mere 1% said they have decreased; and 9% said they have stayed the same.

With 72% saying income levels have decreased or have stayed the same and with 90% saying price levels have increased, both from a year-ago period, it is understandable why these two became the main talking points in the CSDS-Lokniti pre-poll survey.

The confidence levels about the economy are back to pre-pandemic levels. However, it must be noted that the economy had technically entered recession in 2019. Confidence levels are still not back to the 2015-17 levels, as 36% in March 2024 said the economy had worsened from a year-ago period.

## THE REGISTRATION OF BIRTHS AND DEATHS (AMENDMENT) BILL, 2023

The Parliament on the 11th August, 2023 passed the Registration of Births and Deaths (Amendment) Bill, 2023. It comes into effect from October 1, 2023.

"This Act mandates the maintenance of a birth and death database at the national level."

— "It may be used to update various databases, including the National Population Register (NPR), electoral rolls, Aadhaar number, ration card, passport, driving licence, property registration, and others."

— "The Amendment also mandates the registration of the religion of the parents, if they belong to different religions, against the column of the child's religion."

**For Your Information:**

— Civil Registration System (CRS), popularly known as birth and death registration system, is the recording of vital events i.e. Birth, Death & StillBirth. It falls under the Concurrent list of the Constitution of India.

— According to the CRS, the registration level of births for the country has gone up to 92.7% in 2019 from 82.4% in 2011, whereas on the other hand, registration level of deaths during 2019 has increased to 92.0% from 66.4% in 2011.

**WAR OF ATTRITION**

For a long-standing insurgency that peaked in the early to mid-2000s, the war against the Maoists has settled into some sort of pattern. Recently, the insurgents suffered a series of blows from paramilitary and police forces, which include the killing of at least 29 Maoists in the Bastar region in Chhattisgarh on Tuesday. Limited to the jungles of central India and in places of sparse tribal presence with a weaker presence of the developmental and welfare state relative to the rest of the country, the Maoists have been significantly diminished as a political-ideological force with few takers for their party's — the Communist Party of India (Maoist) — ideology or visions of an alternative state. What they have retained, however, is an ability to target security forces — evident in the killing of 22 paramilitary personnel in April 2021 and 10 jawans in April 2023. This has necessitated security forces to use unconventional military tactics and new combing routes to target the armed Maoist cadres. While these attacks weaken the military strength of the Maoists, they cannot cumulatively wipe out the threat of the insurgents as claimed by the Union government. This is because the Maoists are in difficult hilly terrain and have shown the ability to win over some discontented sections of the tribals, who are affected by the civil war.

After two decades of fighting the Maoists, whose strength peaked after two prominent Naxalite parties merged into the CPI (Maoist), the Indian state has long realised that the only way out is to take them on militarily while winning over tribals through welfare measures. In the late 2000s, the use of ploys such as arming tribals to take on the Maoists through flawed campaigns such as the Salwa Judum backfired. Later, in a change of tack, the reach of the welfare state and the bureaucracy gradually expanded into hitherto inaccessible areas in central India and helped negate Maoist propaganda about the Indian state being exploitative. Several tribal people, tired of the warfare and violence, refused to support the Maoists, leading to desertion in their ranks in other States as well. In Chhattisgarh, however, the constant warfare has helped the Maoists tap into some discontent. Civil society and peace activists have tried to initiate ceasefire talks between the Maoists and the security forces besides asking the insurgents to use democratic means to take up tribal causes. But the Maoists, despite setbacks, have refused to give up on their anachronistic ideology. Their unwillingness to accept that the poor tribals, whom they claim to represent, only want better engagement and outcomes from the welfare and electoral system, and not a violent overthrow that jeopardises their lives, has ensured that the war of attrition continues.

**WHAT IS DOXXING AND WHAT MEASURES CAN YOU TAKE IF IT HAPPENS TO YOU?**

A woman in mid-February reached out to the Mumbai Police through X (formerly Twitter) to report a man who had shared a video of her dancing at an event and compared her performance to sex work. The woman clarified that the video was re-posted without her consent and requested the man multiple times to take down the video, but he refused to do so. Many others began to share the video as well, and joined in to harass the woman, who locked her X account. Though the

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video was later disabled by X on copyright grounds, the man — a verified X user with a blue tick — continued to defend his actions.

The act of digitally publicising a person's private details is called doxxing, or doxing. Doxxers generally publicise highly personal data such as other people's home addresses, phone numbers, private email IDs, medical conditions, government documents, social security numbers, live locations, insurance information, private employment details, etc. Such information is usually obtained through illegal methods such as hacking or theft. However, publicising private or semi-public content that an individual did not intend to share for public consumption can also result in doxxing and harassment.

### **The intent behind doxxing**

For example, an ordinary person smoking or sipping whiskey at a house party might consent to their video being shared on their friend's Instagram account, but they may not want that same clip to be publicly re-posted on X or YouTube, with their employers tagged. While the user who circulates an already public image or video may be legally in the clear, their intentions can be malicious and may endanger others.

"We also factor in the intent of the person sharing the information. For example, if we believe that someone is sharing information with an abusive intent, or to harass or encourage others to harass another person, we will take action," stated X in its 'private information and media policy' page.

Doxxing does not end with bringing the perpetrator to justice. These users often share details that easily allow others worldwide to launch their own attacks against the victim, making it harder for the police to take action against all those who are responsible. Furthermore, doxxing is a direct attack on a person's physical, digital, and emotional security. A person who has been doxxed may have to flee their physical location, remain calm for the sake of young family members, clarify the situation with their employers, secure their leaked finances, file a report with the police, upgrade their internet security, be on the lookout for stalkers, and deal with a barrage of violent threats — all at once. Doxxing can also expose the people who live or work near the victim, increasing the affected person's chances of being evicted or fired.

### **What to do when doxxed**

Mishi Choudhary, a technology lawyer and the founder of SFLC.in, advised people who have been doxxed to keep an incident log containing evidence of what has taken place, including the relevant platforms and all those who were involved in the harassment. This can later be shown to law enforcement authorities. "Report the accounts to all platforms on which you have been doxxed as it's against the policies of most social media platforms and they will be quick to take action," Choudhary advised, adding that users should also change all their passwords and turn on two-factor authentication to ensure their security. People who have been doxxed in India can report what happened through the National Cyber Crime Reporting Portal, Choudhary said, and stressed that one has a legal right to file an FIR. This is where the incident log becomes useful.

Platforms such as Meta are aware of the need to protect users who have been doxxed, as the company's oversight board in February 2022 concluded that Facebook and Instagram should have stricter rules concerning incidents where data such as home addresses are leaked online. "Once this information has been shared, the harms that can result, such as doxing, are difficult to remedy. Harms resulting from doxing disproportionately affect groups such as women, children and LGBTQIA+ people, and can include emotional distress, loss of employment and even physical harm



or death,” noted Meta’s oversight board in its findings. Google also has tools in place to assist people who have been doxxed. The company allows internet users to submit removal requests that it then reviews for further action. Remember that YouTube is owned by Google, so one can directly report any content posted there as well. X has an in-app reporting mechanism for private information, and a grievance officer whose job is to take action based on such reports. Reddit also provides a complaint forum.

Recently, messaging platform Discord updated its community policies by separating doxxing and harassment guidelines. The change is set to go into effect in April. “Previously, doxxing was combined with our harassment guideline. However, we consider these distinct harm types, so we separated them to better reflect how we organise our policies,” said the new guidelines on the platform support page.

However, since social media companies operating within the country are bound by India’s IT Rules, submitting a cybercrime complaint is one way to make sure the platform is forced to take action quickly.

That being said, victims of doxxing do not have to leave social media forever. “I always tell people to be generally careful in what they are sharing so they can avoid such a situation but if you have been doxxed, once you feel mentally ready, you can go back,” Choudhary said. At the same time, users also need to make sure that their Personally Identifiable Information (PII) has been removed and that their accounts are secure, she noted. “Have a self care plan. Recruit friends, family and a support structure,” Choudhary suggested. “Without support, it gets harder to do it alone. Women are targeted for several reasons and we must not feel weakened or ashamed.”

#### NEED TO DEVELOP JOINT CULTURE IN ARMED FORCES

Chief of Defence Staff (CDS) General Anil Chauhan on Monday said there is a need to develop a joint culture for the armed forces to distil the best of each service while respecting the uniqueness of each. He said the best of each service is needed to give a de novo approach to traditional concepts, while highlighting the need to integrate the capabilities of the services by creating structures that increase the military’s efficiency and enhance its war-fighting ability and interoperability. Gen Chauhan was addressing the tri-service conference, ‘Parivartan Chintan’, that brainstormed on fresh ideas, initiatives and reforms to push integration among the three services.

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

— The CDS has a dual-hatted role which refers to the two hats the CDS wears: one of the permanent Chairman of the Chiefs of Staff Committee which has the three service chiefs as members, and the other of the head of the newly created Department of Military Affairs (DMA) in the ministry. The former is a military role while the latter is a role in the government; it is as the head of DMA that his major responsibilities within the ministry will be discharged.

— One of the key mandates of the CDS is to work towards the creation of theatre commands as part of a greater transformation.

#### INDIA DELIVERS FIRST BATCH OF BRAHMOS SUPERSONIC MISSILES TO PHILIPPINES

India delivered the first batch of BrahMos supersonic cruise missiles to the Philippines on Friday. In January 2022, the Philippines concluded a \$375-million deal with India for three batteries of a

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shore-based, anti-ship variant of the BrahMos becoming the first export customer for the joint venture missile between India and Russia.

The first batch was delivered aboard a transport aircraft of the Indian Air Force which landed in the Philippines on Friday afternoon. Specifics of the delivery made were not immediately available. The Philippines is acquiring the systems under the Horizon 2 of the Revised Armed Forces of the Philippines Modernisation Program- me.

The delivery comes amid the showdown between the Philippines and China in the South China Sea and will significantly augment the defensive posture of the Philippines armed forces once the systems are operationalised.

During his visit to the Philippines in March, External Affairs Minister S. Jaishankar in a meeting with the Secretary of National Defence of the Philippines Gilberto C. Teodoro, Jr. reaffirmed India's commitment to upholding a rules-based international order and promoting peace and security in the Indo-Pacific region.

In January 2022, then Philippines Defence Secretary Delfin N. Lorenzana, who signed the contract said, "As the world's fastest supersonic cruise missiles, the BrahMos missiles will provide deterrence against any attempt to undermine our sovereignty and sovereign rights, especially in the West Philippine Sea."

The contract includes the delivery of three missile batteries, training for operators and maintainers as well as the necessary Integrated Logistics Support package. The coastal defence regiment of the Philippine Marines will be the primary user of the missile systems.

From January 23 to February 11, 2023, 21 Philippine Navy personnel were trained in the operations and maintenance of the systems in Nagpur and were awarded interim missile badges by the Indian Navy chief, Admiral R. Hari Kumar.

As reported earlier, several countries have expressed interest in acquiring BrahMos systems and discussions are in advanced stages with Indonesia and Thailand, among others.

BrahMos is a joint venture between the DRDO and Russia's NPO Mashinostroyeniya and the missile derives its name from Brahmaputra and Moskva rivers. The missile is capable of being launched from land, sea, sub-sea and air against surface and sea-based targets and has been long inducted by the Indian armed forces.

## OPENING UP

The Finance Ministry has notified amended rules under the Foreign Exchange Management Act to operationalise its earlier decision to allow up to 100 per cent foreign direct investment (FDI) for the space sector through three categories of liberalised entry routes. The new rules came into effect from April 16.

— In February, the Union Cabinet had approved the amendment to the FDI policy for the space sector, allowing up to 100 per cent investment in certain categories.

— As per the latest Finance Ministry notification, 100 per cent FDI has been allowed for the space sector category of manufacturing and operation of satellites, satellite data products, and ground segment and user segment, out of which up to 74 per cent would be through the automatic route and government nod would be required for investment beyond 74 per cent.

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— Under the earlier policy, any foreign investment in manufacturing and operating satellites is allowed only with government approval.

— Manufacturing of components and systems or sub-systems for satellites, ground segment and user segment will be fully under the 100 per cent automatic route.

— Automatic FDI has also been permitted up to 49 per cent for launch vehicles and associated systems or subsystems, and creation of spaceports for launching and receiving spacecraft. Government approval would be required for investments beyond 49 per cent.

— Ministry has also provided detailed definition of ‘Satellites – manufacturing and operation’, ‘Satellite data products’, “launch vehicles and associated systems or sub-systems”, “spaceport” etc.

**For Your Information:**

— Foreign Direct Investment (FDI) is defined as an investment in which a company takes controlling ownership of a business entity in another country. Therefore, foreign companies get directly involved with day-to-day operations in other countries.

— India gets FDI through two routes:

- a) Automatic route: Under this route, the non-resident or Indian company does not require a prior nod from the Reserve Bank of India (RBI) or the government of India for FDI.
- b) Government route: Under this route, the government’s approval is mandatory.

**GOPI THOTAKURA TO BE THE FIRST INDIAN SPACE TOURIST: WHAT IS SPACE TOURISM?**

Entrepreneur and pilot Gopi Thotakura is set to become the first Indian to venture into space as a tourist on the NS-25 mission of Blue Origin — a company founded by Jeff Bezos, who is also the founder of Amazon.

Thotakura has been selected as one of the six crew members for the mission, whose launch date is yet to be announced. If the mission is successful, Thotakura would be the second Indian to go into space. The first one was Wing Commander Rakesh Sharma, who flew to the Salyut 7 space station on a Soviet spacecraft in 1984.

In recent years, space tourism has grown by leaps and bounds. According to media reports, in 2023, the space tourism market was valued at \$848.28 million. It is expected to grow to \$27,861.99 million by 2032. However, there are several challenges, such as high cost, and environmental concerns, that may limit the industry’s growth.

Here is a look at who Thotakura is, what space tourism is, and what challenges it is facing.

**Who is Gopi Thotakura?**

A graduate of the US-based Embry-Riddle Aeronautical University, Thotakura flies jets commercially, according to a press release by Blue Origin.

“Gopi is a pilot and aviator who learned how to fly before he could drive,” it said. He is also a co-founder of Preserve Life Corp — a global centre for holistic wellness and applied health located near Hartsfield-Jackson Atlanta International Airport.



“Gopi pilots bush, aerobatic, and seaplanes, as well as gliders and hot air balloons, and has served as an international medical jet pilot. A lifelong traveller, his most recent adventure took him to the summit of Mt. Kilimanjaro,” the press release said.

#### **What is space tourism?**

Space tourism is essentially a section of the aviation sector which seeks to provide tourists with the opportunity to become astronauts and experience space travel for recreational, leisure, or business purposes, according to the book ‘Air Transport: A Tourism Perspective’, edited by Anne Graham, Frederic Dobruszkes.

There are two main types of space tourism, sub-orbital and orbital. The sub-orbital spacecraft takes passengers just beyond the Kármán line — it lies nearly 100 kilometres above our heads and is considered to be the boundary between Earth’s atmosphere and outer space. The passengers get to spend a few minutes in outer space and then come back to Earth.

The NS-25 mission, which Thotakura is a part of, is a sub-orbital mission. Thotakura and his other crew members will be taken to outer space via New Shepard, a fully reusable sub-orbital launch vehicle developed specifically for space tourism by Blue Origin.

The orbital spacecraft, on the other hand, takes passengers much further than the Kármán line. Usually, passengers can spend from a couple of days to more than a week at an altitude of nearly 1.3 million feet.

In September 2021, Space X’s Falcon 9 took four passengers to an altitude of 160 km where they spent three days orbiting the Earth.

#### **What are the challenges?**

Currently, space tourism is expensive. A passenger generally has to pay at least a million dollars to reach outer space. This amount is out of reach for almost everyone.

Moreover, several studies have pointed out that space tourism may lead to environmental damage as rockets emit gaseous and solid chemicals directly into the upper atmosphere.

A 2022 study done by researchers University College London (UCL), the University of Cambridge and the Massachusetts Institute of Technology (MIT) found that the soot emissions from rocket launches are far more effective at warming the atmosphere compared to other sources.

Safety is also a concern when it comes to space tourism. Despite high safety standards, a total of 676 people have flown into space and 19 of them have died, as of November 2023, according to a report by Astronomy Magazine. This means that approximately 3% of astronauts died during their space flight which is quite a high fatality rate.

### **MISSING COLLEGES**

Even lofty dreams can be felled by the nitty-gritty of implementation. Nothing exemplifies this as much as the case of the Madurai AIIMS. The idea of starting a number of All India Institute of Medical Sciences (AIIMS) across the country certainly comes from a clear need — to bridge the gap between demand and supply in India, and set right the grossly inefficient doctor-patient ratio. In 2003, the Centre announced the Pradhan Mantri Swasthya Suraksha Yojana (PMSSY) with this precise goal. It was in 2006 that the PMSSY got off the ground and a total of six AIIMS-like medical



institutions were created in the country. Currently, there are 20 AIIMS institutions with functional medical colleges and three are under development. No doubt, these institutions have created plentiful opportunities for students and advanced the goal of taking affordable health-care education beyond metros. But the intentions are more robust than implementation. At AIIMS Madurai, a project that has caused a further embittering of relations between the central and State governments, there are persistent complaints of inadequate infrastructure, facilities, and manpower constraints. A 'prestige' project for the Centre, Prime Minister Narendra Modi laid the foundation stone for construction at Thoppur, Madurai, in January 2019. From 2021, undeterred by the lack of something as basic as a building, the administration invited applications from students. The construction work is still not complete, and not one, but three batches of undergraduate students have been accommodated at the Government Medical College and Hospital, in nearby Ramanathapuram district. Last week, these students went on protest, stating that there was a ravine-like gulf between what was expected of an AIIMS institution and their experience of it in Madurai — in terms of infrastructure, but also exposure to patients.

The extraordinary delay in constructing the AIIMS became a contentious issue during the 2021 Assembly elections in Tamil Nadu, with Udhayanidhi Stalin of the Dravida Munnetra Kazhagam, now a Minister, pointing to a single brick as the sum total of construction activity there. While there are assurances that the project would be completed soon and students shifted to Madurai, it is true that 150 students have already been impacted by this tardy implementation. Meanwhile, the original issue behind starting AIIMS remains unresolved. As per official data, the doctor-population ratio in the country stands at 1:834, worse in rural areas. It is the role of the Centre and the State to work together to ensure that these medical institutions are able to provide high quality education, and that students not made victims at the altar of federal relations.

## RAIN SHOCKS

The India Meteorological Department (IMD) has forecast a bountiful monsoon. Rainfall from June-September is expected to be 6% more than the 87 cm, which is considered to be the average rainfall the country receives during these months. This is a fairly bold forecast by the agency that, typically in its April forecast, avoids suggesting either surplus or deficit rain. Given that temperatures in many southern States are soaring and stoking heatwaves, the anticipation of bountiful rainfall might sound like welcome news. There is however a dark cloud to this silver lining. The IMD's climate models suggest a 30% chance of "excess" rains — defined as more than 10% of what is usual. By comparison, its expectation of "above normal" rains is 31%, defined as between 5%-10% of what is normal. The slim difference suggests that excessive rains are as likely as merely 'above normal' showers. Most of these rains are expected in the second half of the monsoon, or August and September. The IMD's models forecast for this are premised on the development of a La Niña, or a converse of the El Niño (which more often than not results in a decrease in monsoon rainfall). The La Niña is also expected to be aided by a positive Indian Ocean Dipole, characterised by a cooler than normal Indian Ocean in the east as compared to the west, that helps bring rain to several States in southern India. The IMD is silent on the quantity of rains in June and July but expects "neutral conditions" (neither El Niño, nor La Niña) to be prevalent that time. Two arid monsoon months and torrential rains in the last two may be fine for agriculture but is likely to result in extreme floods and — as has been observed in the past — immense damage to lives, livelihoods and infrastructure.

The 2018 floods in Kerala continue to be a reminder of how vulnerable India is to natural disasters. While an update to the forecast is expected around the end of May, the IMD's current





signal must be urgently heeded. States must, at the soonest, draw up emergency plans from their disaster-management modules to bolster infrastructure, prepare evacuation plans, conduct audits of the structural stability of dams and their distress-signalling network and ensure that broader early-warning networks are in place. Also, India's farmers, a majority of whom continue to be dependent on rain-fed agriculture, must also be informed of the possibility of a stronger, second half of the monsoon and incorporate these in their sowing operations.

## HOW A BEAM OF SUNLIGHT WAS DIRECTED ON LORD RAM'S FOREHEAD IN AYODHYA TEMPLE

A three-minute-long Surya Tilak ceremony — where a beam of sunlight was projected onto the forehead of Lord Ram's idol — was performed at noon on Wednesday (April 17) in Ayodhya's newly-built Ram temple, marking the occasion of Ram Navami.

This was achieved using a special mirror-lens arrangement, designed by astronomers at the Indian Institute of Astrophysics (IIA), Bengaluru, that has been installed in the building by a team from the Central Building Research Institute, Roorkee.

We explain the science behind Ram Lalla's Surya Tilak.

### Step 1: Predict the Sun's position (each year)

When following the Gregorian calendar, the date of Ram Navami (the Hindu festival celebrating the birth of Lord Ram) varies each year. This is because the Gregorian calendar is a solar calendar (based on Earth's revolution around the Sun — one revolution equals to one year), while the Hindu calendar is a lunar calendar (based on the Moon's revolution around Earth — one revolution equals to one month).

A solar year has roughly 365 days, whereas a lunar year is roughly 354 days long.

Given that the IIA team's brief was to channelise the sun's rays such that they fall on the Ram idol's forehead on Ram Navami, its first task was to calculate the position of the Sun in the sky on that day in any given year.

Annapurni Subramaniam, Director, IIA, told The Indian Express: "There were two challenges to address, the first of which was to estimate and predict the position of the Sun in the sky on a particular day in a particular year."

### Step 2: To channelise the Sun's rays

After astronomers estimated where the Sun will be in the sky, their second task was to channelise the sunbeam "in a manner that it will fall on the idol's forehead for a certain amount of time," Subramaniam said.

The IIA team, which began designing the apparatus three years ago, proposed a four-mirror-and-four-lens array for this purpose. "The first mirror, responsible for receiving the sunlight, has to be positioned at an angle along the path of the sun rays," she explained.

The light will then be reflected to three other mirrors, and will pass through four lenses until it is of the desired intensity, and will be directed to the idol's forehead. The mirrors directed the beams while the lenses made them converge to the required intensity.



#### How the system works. (Source: IIA)

This opto-mechanical system operates on a principle similar to that of a periscope — like the ones you used to make for school projects. Given that the sun’s position vis-à-vis the first mirror will vary each year, a specially designed 19-gear system was built to make requisite adjustments.

“Once a year, one tooth of the gear will have to be manually turned so that the angle of the pickup mirror (first mirror) is adjusted, and it is ready to capture the Sun’s rays,” Subramaniam said.

The number 19 was chosen to correspond to the Metonic cycle — a period of 19 years in which there are 235 lunar months, after which the Moon’s phases recur on the same days of the solar year. This means that every 19 years, the system will effectively reset, and the cycle will then begin again.

#### Not the final setup

The glass tube set-up, housing the lenses and mirrors, runs from the third floor of the temple, all the way to the sanctum sanctorum. This huge set-up requires precision handling, and a clean environment to operate. The IIA team was especially concerned about the final mirror positioned inside the sanctum sanctorum, where general activity and havans can lead to soot and dust gathering.

“Care must be taken to prevent the fumes (from the sanctum sanctorum) from reaching the final mirror. The lenses and the mirrors should not get clouded,” Subramaniam said. This is why the design allows the final mirror to be opened and cleaned, if required.

Since the construction of the temple is yet to be complete, the installation of the final system has not yet taken place. On Wednesday, for the temple’s first Ram Navami celebration, a modified version of the system, having four mirrors and two lenses, was deployed from the second floor of the temple building.

### WHAT IS THE BHOJSHALA-KAMAL MAULA COMPLEX DISPUTE?

#### The story so far:

On March 22, the 13th century Bhojshala-Kamal Maula complex in Madhya Pradesh’s Dhar district became the latest site for a “scientific survey” by the Archaeological Survey of India (ASI). The action followed the Madhya Pradesh High Court ruling which had, on March 11, ordered the ASI to conduct a survey of the premises within six weeks. The complex is contested by Hindus and Muslims as the Vagdevi temple and Kamal Maula Masjid, respectively.

#### What has the Supreme Court said?

Even as a 15-member ASI team along with the district administration and local police began the survey of the entire complex, the Supreme Court issued a word of caution on April 1. A Bench presided over by Justice Hrishikesh Roy said no physical excavation that would alter the character of the premises should be carried out. The court’s cautionary note followed the mosque’s appeal against the High Court order. The top court also ordered that no further action should be taken on the outcome of the excavation without its permission.



### What has been the status quo?

The Bhojshala-Kamal Maula temple-mosque compound has had a truce for the past 20 years. Following an arrangement in 2003, Hindus perform puja here on Tuesday while Muslims perform namaaz on Friday. Despite the occasional hiccup, the system worked fine until recently when a little-known outfit by the name of 'Hindu Front for Justice' petitioned the High Court, claiming the complex was a temple built in 1034 and the mosque here was constructed during the reign of Sultanate king, Alauddin Khalji in the 13th century by "destroying and dismantling ancient structures of previously constructed Hindu temples". Dhar itself has been a city of prominence during the time of the Paramaras, the Marathas and the Delhi Sultanate.

The Muslims, however, claim no existing place of worship was demolished by Maula Kamaluddin Chishti, a sufi, after whom the mosque was named. He was a disciple of Nizamuddin Auliya and is said to have migrated to Dhar in 1291. He preached here for around 40 years. His tomb, built next to the mosque inside the complex here, is frequented by people of both faiths. They claim too that the ASI mentioned the Kamal Maula mosque in its records in 1902, and allege that the controversy began the same year when Kanshi Ram Lele, an education officer, found Sanskrit shlokas written on the floor of the mosque, and concluded it was the mythical Bhojshala.

### Have there been surveys before?

A survey was carried out during the British regime by John Malcolm in 1822 who mentioned many legends about Raja Bhoja, including the dams he built, but did not mention any Bhojshala. Malcolm did refer to the current building as a mosque albeit in ruins. He mentioned too a pulpit approached by a flight of stairs. On its floor, Malcolm is said to have found a Hindu inscription, indicating the mosque was built with pre-used material. Whether the pre-used material was of a local place of worship or otherwise, he did not investigate.

In 1935, the Front claims permission was granted by the local king for namaaz for a day. After Independence, the Jan Sangh entered the fray and started a protest for the restoration of the alleged temple. Then, around the time the Babri Masjid-Ramjanambhoomi stir was at its peak, attempts were made to whip up Hindu sentiments and recite Hanuman Chalisa here. The attempts were foiled by the administration. In 1998 a petition was filed in the High Court in 1998 by Vimal Kumar Godha on behalf of the Bajrang Dal and other Hindu bodies. The Kamal Maula mosque continued to be contested by the Hindu outfits in the legal domain. In 2002, around the time of Gujarat pogrom, there was violence around the ownership of the place of worship here as well. The local administration stated the place was "Kamal Maula mosque" and the existence of Bhojshala was a "mystery". Next year, a truce was arrived at with specific days for worship for both communities. The same words were quoted by the High Court recently while ordering a survey of the place.

## FOSSILS OF HUGE PREHISTORIC SNAKE FOUND IN KUTCH MINE

Researchers at the Indian Institute of Technology (IIT), Roorkee have reported the discovery of fossils of one of the largest snakes that ever existed and likely lived 47 million years ago during a period called the Middle Eocene. The fossils were found in Kutch, Gujarat, and the reptile, named Vasuki Indicus, could have been anywhere between 10 metres and 15 metres long, or as big as a modern-day school bus.



It belonged to the now-extinct Madtsoiidae snake family but represents a unique lineage from India, the authors note.

Professor Sunil Bajpai and post-doctoral researcher Debajit Datta at the IIT-Roorkee stumbled upon 27 pieces of a “partial, well preserved” vertebral column of the snake at the Panandhro Lignite Mine in Kutch.

The discovery, the authors report in the peer-reviewed journal, Nature Scientific Reports, could improve understanding of how the Madtsoiidae species evolved in different kinds of climate, as well as the factors that contributed to large body sizes. One of the causative factors is held to be high temperatures in the tropical climate of that time.

Vasuki Indicus existed at a time when the earth looked quite different from today, and Africa, India and South America were one, conjoined landmass. It likely had a cylindrical body, hinting at a robust and powerful build, and was as big as Titanoboa, a massive snake that once roamed the earth and is reportedly the longest ever known, said a press statement from IIT-Roorkee.

“This discovery is significant not only for understanding the ancient ecosystems of India but also for unravelling the evolutionary history of snakes on the Indian subcontinent...,” Dr. Bajpai said in a statement.



# DreamIAS



## BUSINESS & ECONOMICS

### WHY CHINA ECONOMY GREW FASTER THAN EXPECTED, WHAT LIES AHEAD

China, the world's second largest economy, reported a stronger-than-projected economic growth of 5.3 per cent in the January-March quarter of 2024, despite challenges that range from a lingering property market downturn to the continued sluggishness in domestic demand.

— The latest numbers released by China's National Bureau of Statistics on Tuesday (April 15) showed growth was propelled by an expansion in the country's services sector, as well as upbeat external demand boosting export growth, especially in the industrial sector.

— "Any uptick in the growth figures of the world's second largest economy would have its impact on global growth."

— According to the World Bank, the Chinese economy is vulnerable to softer global demand and increased geoeconomic tensions. Climate change and the rising frequency of extreme weather events also pose a downside risk.

— While India's nominal GDP, at \$3.4 trillion in 2022, is just short of what China's was in 2007, there is no escaping the fact that India has been a relative growth underperformer.

— The Chinese story is extraordinary for not just the almost 46-fold expansion in its economy between 1990 and 2022 (against India's 11-fold), but also because it has been accompanied by an increase in per capita GDP from \$348 (less than India's \$369) to \$12,720 (far more than India's \$2,411) during this period. The World Bank's per capita GNI (gross national income) threshold for categorising a country as "high income" is \$13,846, and China isn't far from attaining this status.

### FLEETING RELIEF

For the first time in five months, India's retail inflation slid below the 5% mark in March, to 4.85%. While it constituted only a marginal easing from the 5.1% recorded in February, this was the lowest pace of price rise recorded since May 2023. The average inflation of 5% clocked in the final quarter of 2023-24 is not just in line with Reserve Bank of India (RBI) projections but also the slowest in three years. For the full year gone by, consumer price rise averaged 5.4%, as the RBI had forecast — a four-year low. Core inflation, excluding energy and food prices, has been under the 4% mark for four straight months. QuantEco Research estimates that overall fuel inflation in India hit a four-year low of -2.7% in March, which was the seventh straight month of disinflation in the segment. No doubt, the ₹2 per litre cuts in petrol and diesel prices and the ₹100 drop in cylinder prices have helped, though the full impact of these pre-poll steps will be seen this month. Amid these pleasant portents, two critical problems persist — food bills remain problematically high, even as overall inflation is rising for rural consumers, already hit by a weak monsoon.

Inflation, as measured by the Consumer Food Price Index, has averaged an alarming 8% through 2023-24, and 8.5% in the January to March quarter. And while some government interventions have helped check a few items' prices and hopes of a normal monsoon this year could lift some pressure points, perhaps from July onwards, the ongoing heat waves across large parts of the country remain a threat to perishable supplies. Moreover, some key items are seeing deeply entrenched inflation trends — double-digit inflation has now been seen for five months in



vegetables, 10 months in pulses and a whopping 22 months in spices. Cereals inflation picked up pace in March, breaking a seven-month moderating streak, while eggs, meat and fish are also seeing spikes. While the RBI expects inflation to cool to 4.5% this year, it is projected at 4.9% for the first quarter. A durable descent to its 4% target that has now been elusive for 54 months, remains tricky. For urban consumers, inflation eased tantalisingly close to the target in March at 4.14%, but it rose in rural India to 5.45% from 5.34% in January and February. While a prolonged phase of high prices is already hurting consumption, the resurgence in crude oil prices to a seven-month high of \$90 a barrel this month, faltering hopes of interest rate cuts in the United States and the European Union, and strife-fuelled shipping cost spikes, pose fresh worries on the inflation front in the months to come.

## PALE GREEN SHOOTS

India's merchandise exports hit a 12-month peak of \$41.7 billion last month, marginally lower than March 2023 and a tad higher than February's \$41.4 billion figure. Imports fell 6% to \$57.3 billion, taking the trade deficit to an 11-month low. The last two months' robust export numbers bolstered the tally for outbound shipments from \$354 billion at the end of January to \$437.1 billion for the full year, just 3% short of the record \$451 billion performance in 2022-23. Amid a decline in commodity prices, which averaged about 14% lower last year, this is a commendable outcome, aided by demand proving more resilient than earlier anticipated in major markets. That imports dipped at a higher 4.8% pace has also cushioned the trade deficit, and economists now expect the January-March quarter to end up with a small but rare current account surplus. Services trade data for the full year will be available later, but the Commerce Ministry estimates that total exports in 2023-24 were fractionally higher than the previous year at \$776.7 billion.

Trade mandarins believe goods exports have entered a positive growth cycle, having coped with persistent strife — from Ukraine to Palestine and the Red Sea. Last week, the World Trade Organization (WTO) downgraded its global trade volume growth projection to 2.6% from 3.3% reckoned earlier, with risks tilted towards the downside. This is despite favourable base effects from its revision for 2023 trade volumes, which the WTO says tanked 1.2% compared with a 0.8% dip expected earlier. Export volumes from Asia are expected to rise 3.4% in 2024, with imports climbing 5.6%. In India, a healthy monsoon is expected to spur domestic demand, including for discretionary imports. But sustained disruptions on two of the world's key shipping routes — the Suez and Panama Canals — along with geopolitical fault lines and an increasing scepticism about the benefits of global trade in several countries, pose creeping risks that have not fully manifested yet. Exporters do not seem so sure about the upbeat official outlook — they need to start raising prices soon to catch up with shipping cost surges, exposing them to competitive pressures. For Asia and India, any prolonged friction in the Strait of Hormuz, a key supply route for the region's oil and gas imports, is the biggest threat to trade and macroeconomic balances. The spike in crude prices already showed up in March as the petroleum trade deficit hit a record monthly high of \$11.8 billion while oil exports slid to an eight-month low. India's high energy import dependence is known, and any spurt in global energy and food prices would also derail hopes of global interest rate cuts and improved demand.

## IMPORTED INFLATION: HOW IMPORT COSTS CAN INCREASE THE PRICES OF GOODS AND SERVICES

Imported inflation refers to the rise in the prices of goods and services in a country that is caused by an increase in the price or the cost of imports into the country. It is believed that a rise in input



costs pushes producers to raise the price they charge from their local customers, thus boosting inflation.

#### **A fall in the rupee**

A depreciation in the value of a country's currency is generally seen as the most important reason behind imported inflation in an economy. This is because when a country's currency depreciates, people in the country will have to shell out more of their local currency to purchase the necessary foreign currency required to buy any foreign goods or services, which in turn means that they will effectively be paying more for anything that they import. The Asian Development Bank recently warned that India could face imported inflation as the rupee could depreciate amid the rise in interest rates in the West. A rise in interest rates in the West tends to cause the currencies of developing countries to depreciate against western currencies, which in turns can lead to higher import costs for these countries.

A rise in import costs even without depreciation in the value of a country's currency is also believed to lead to import inflation. So a rise in international crude oil prices due to fall in oil output, for instance, is expected to cause prices to rise across an economy which imports oil to produce goods and services. The idea of imported inflation, it should be noted, is simply a variant of cost-push inflation which states that a rise in the cost of inputs can lead to an inflation in the prices of final goods and services.

#### **Consumers decide prices**

Critics of the proposition that rising import costs can lead to a rise in inflation believe that it is a fallacious economic idea. They state that it might seem commonsensical to believe that input costs determine price, and hence that higher costs should lead to higher prices for goods and services. After all, it is common to see a lot of businesses in the real world raise the price of their products when their input costs rise. It may thus seem true, from an individual business' point of view, that costs determine prices.

However, the critics state, it is simply not true that costs determine price when seen from an economic point of view. Instead, they state that it is the prices that customers are willing to pay for the final goods and services that ultimately determine the cost of all inputs that go into making products.

It should be carefully noted that producers are willing to pay for various inputs based on what price they believe they can sell their final output for to their customers. So, if the cost of inputs were set at a price that is higher than what producers are willing to pay (based on final consumer demand), this would cause the available supply of inputs to go unsold as producers are unwilling to purchase the inputs. This, in turn, would cause the price of inputs to drop in accordance with final consumer demand.

Stated simply, value is imputed backwards from final consumer goods and services to inputs that go into making these final goods and services. The idea of imputation of value from final consumer goods and services to the various factors of production was elaborated famously by Austrian economist Carl Menger in his 1871 book Principles of Economics.

It can be further argued that even when import costs rise due to a depreciating currency, the rise in costs is still ultimately driven by the demand for the final output among consumers. To understand this, it should be noted that the value of a currency depreciates against a foreign



currency when its supply becomes relatively more abundant than the foreign currency in the forex market. In other words, the exchange rate of a currency depreciates to reflect the greater demand for the foreign currency in terms of the local currency. So, the resulting rise in import costs due to depreciation itself can be seen simply as a reflection of a change in the nominal demand for inputs.

Stated simply, it is not currency depreciation that is causing input costs and the prices of final goods to rise; rather, the currency depreciation is simply a reflection of higher nominal demand for imported goods from final consumers.

## WHY HAVE PRIVATE INVESTMENTS DROPPED?

### The story so far:

The failure of private investment, as measured by private Gross Fixed Capital Formation (GFCF) as a percentage of gross domestic product (GDP) at current prices, to pick up pace has been one of the major issues plaguing the Indian economy. Private investment witnessed a steady decline since 2011-12 and the government has been hoping that large Indian corporations would step in and ramp up investment. In fact, in 2019, the Centre slashed corporate taxes from 30% to 22% hoping that the move would encourage private investment.

### What is GFCF and why does it matter?

GFCF refers to the growth in the size of fixed capital in an economy. Fixed capital refers to things such as buildings and machinery, for instance, which require investment to be created. So private GFCF can serve as a rough indicator of how much the private sector in an economy is willing to invest. Overall GFCF also includes capital formation as a result of investment by the government.

GFCF matters because fixed capital, by helping workers produce a greater amount of goods and services each year, helps to boost economic growth and improve living standards. In other words, fixed capital is what largely determines the overall output of an economy and hence what consumers can actually purchase in the market. Developed economies such as the U.S. possess more fixed capital per capita than developing economies such as India.

### What is the trend seen in private investment in India?

In India, private investment began to pick up significantly mostly after the economic reforms of the late-1980s and the early-1990s that improved private sector confidence. From independence to economic liberalisation, private investment largely remained either slightly below or above 10% of the GDP. Public investment as a percentage of GDP, on the other hand, steadily rose over the decades from less than 3% of GDP in 1950-51 to overtake private investment as a percentage of GDP in the early 1980s. It, however, began to drop post-liberalisation with private investment taking on the leading role in fixed capital formation.

The growth in private investment lasted until the global financial crisis of 2007-08. It rose from around 10% of GDP in the 1980s to around 27% in 2007-08. From 2011-12 onwards, however, private investment began to drop and hit a low of 19.6% of the GDP in 2020-21.

### Why has private investment fallen?

Many economists in India have blamed low private consumption expenditure as the primary reason behind the failure of private investment to pick up over the last decade, and particularly since the onset of the pandemic. Their reasoning is that strong consumption spending is required





to give businesses the confidence that there will be sufficient demand for their output once they decide to invest in building fixed capital. Hence these economists have advised that the government should put more money into the hands of the people to boost consumption expenditure, and thus help kick start private investment.

Historically, however, an increase in private consumption has not led to a rise in private investment in India. In fact, a drop in consumption spending has boosted private investment rather than dampening it. Private final consumption expenditure dropped steadily from nearly 90% of GDP in 1950-51 to hit a low of 54.7% of GDP in 2010-11, which was a year prior to when private investment hit a peak and began its long decline. And since 2011-12, private consumption has risen while private investment has witnessed a worrying fall as a percentage of GDP. The inverse relationship between consumption and investment is likely because the money that is allocated towards savings and investment, either by the government or by private businesses, comes at the cost of lower consumption expenditure. Other economists believe that structural problems may likely be the core reason behind the significant fall in private investment as a percentage of GDP over the last decade or so. They have cited unfavourable government policy and policy uncertainty as major issues affecting private investment. The rise in private investment in the 1990s and the 2000s correlated with the economic reforms programme started in 1991. The drop in private investment, on the other hand, correlated with the slowdown in the pace of reforms in the last two decades under both the UPA (second term) and NDA governments. Further, policy uncertainty can discourage private investment as investors expect stability to carry out risky long-term projects.

#### **What about low private investment?**

The biggest cost of low private investment would be slower economic growth as a larger fixed capital base is crucial to boost economic output. The push by the government to increase government investment is also seen as a negative by some who believe that it crowds out private investment.

Others, however, think that government investment compensates for the lack of private investment. It should be noted, however, that private investors are considered to be better allocators of capital than public officials, helping avoid wasteful spending. Further, taxes imposed to raise money for public spending can be a significant drag on the economy.

### **WHY HAS INDIA ALLOWED FIIS TO INVEST IN ITS GREEN BONDS?**

#### **The story so far:**

On April 5 the Reserve Bank of India (RBI) green lighted investments in the country's Sovereign Green Bonds (SGrBs) by Foreign Institutional Investors (FIIS) — investors such as insurance companies, pension funds and nation-states' sovereign wealth funds. SGrBs are a kind of government debt that specifically funds projects attempting to accelerate India's transition to a low carbon economy.

#### **How does it help in green transition?**

Allowing FIIs to invest in India's green projects widens the pool of capital available to fund the country's ambitious 2070 net zero goals, ensuring 50% of India's energy comes from non-fossil fuel based sources and to reduce the carbon intensity of the nation's economy by 45%, as pledged by Prime Minister Narendra Modi at COP26 in Glasgow 2021.



The RBI had issued SGrBs worth ₹16,000 crore in two tranches in January and February last year with maturities in 2028 and 2033. While in both instances the bonds were oversubscribed, the main participants were domestic financial institutions and banks, narrowing the avenues from where the government could borrow. Moreover, these green Government-Securities (G-Secs) were classified under the Statutory Liquidity Ratio (SLR), a liquidity rate fixed by the RBI that financial institutions must maintain with themselves before they lend to their customers.

SGrBs yield lower interest than conventional G-Secs, and the amount foregone by a bank by investing in them is called a greenium. But central banks and governments the world over are encouraging financial institutions to embrace greeniums to hasten the transition to a greener future. Climate finance experts believe India would gain from allowing FIIs in green G-Secs. They say FIIs are also looking to diversify their pool of green investments, as there is considerable regulatory support particularly in developed countries. And so this is an opportunity for them to invest in India's green g-secs. Ashim Roy, Energy Finance lead at World Resources Institute, India said FIIs might also be looking to gain green credentials when such investments may not be available in their home markets, and because India has successfully addressed greenwashing fears with the Sovereign Green Bonds Framework in late 2022.

#### **What is the green taxonomy gap?**

In the 2022-23 Union Budget, Finance Minister Nirmala Sitharaman announced the government's decision to issue SGrBs to accelerate funding government projects such as harnessing offshore wind, grid-scale solar power production, or encouraging the transition to battery operated Electric Vehicles (EVs). But the RBI had not created a green taxonomy, or a way to assess an investment's environmental, or emissions credentials to ensure the project is not an attempt at greenwashing, that is, faking green credentials to secure funding.

To address this gap, the Finance Ministry released India's first SGrB Framework on November 9, 2022 detailing the kind of projects that would receive funding through this class of G-Secs. These included "investments in solar/wind/biomass/hydropower energy projects (under 25 MW) that integrate energy generation and storage; supporting public lighting improvements (e.g. replacement with LEDs); supporting construction of new low-carbon buildings as well as energy-efficiency retrofits to existing buildings; projects to reduce electricity grid losses." The list goes on to include promoting public transport, subsidies to adopt EVs and building charging infrastructure. The government also sought Norway-based validator Cicero's opinion comparing India's SGrB Framework with International Capital Market Association's (ICMA's) green principles. Cicero rated India's framework as "green medium" with a score of "good governance". WRI's Ashim Roy said, "it would be crucial to identify new green projects with credible audit trails and high impact to optimally deploy the proceeds, especially ones that has received limited private capital like Distributed Renewable Energy and clean energy transition finance for MSMEs."



## LIFE & SCIENCE

### FERTILITY LEVELS DROP BELOW ONE IN MANY ASIAN NATIONS

Many countries in East and Southeast Asia are in the middle of a population crisis, with fewer births every year and record-low fertility rates. In March this year, several hospitals in China stopped offering newborn delivery services due to declining demand, Reuters reported. In fact, with the fertility rates in South Korea hitting rock bottom, the city of Seongnam, the fourth largest in the country, resorted to hosting mass blind dates hoping that the falling birth rates would reverse.

This was not always the case. Between 1950 and 1970, fertility rates in East Asian and Southeast Asian countries ranged from 3.5 to 7.5. The total fertility rate (TFR) is the average number of children a woman is expected to have in her lifetime. A TFR of 2.1 (the 'replacement level') is required to ensure that the population size remains stable.

Currently, in four countries — South Korea, Singapore, Hong Kong, and Taiwan — the fertility rates are lower than one. This means that while the majority of women in these countries have only one child, many are also not choosing to have children, pulling down the average below one. For instance, in South Korea, the TFR slid to a record low of 0.72 in 2023, while in Hong Kong, the TFR was 0.701 in 2022. Both these countries currently have among the lowest fertility rates in the world. Chart 1 shows the TFR in six countries, including China and Japan, over a period of time.

In the six countries considered, not only is the TFR significantly lower than 2.1, it has seen a drastic reduction over time. This is evident when the TFR of these countries is compared with that of Ukraine, Finland, Italy, and Spain — countries which also have among the lowest TFRs in the world currently (Chart 2). For instance, in a span of 50 years, China reduced its TFR from 6.51 (1968) to 1.16 (2021) through various policies, while Spain's TFR came down gradually from 2.87 to 1.28. India's TFR also witnessed a drop from over 5.7 to 2.03 in the same period, though not as sharp as that of China's.

The sharp fall in China's TFR is attributable largely to policies its government adopted to control population growth. South Korea's slogan in the 1980s, "Even two children per family are too many for our crowded country", and Singapore's slogan for its two-child policy, "The more you have, the less they get — two is enough", are examples of strict family planning measures.

The drastic drop in fertility rate can also be attributed to women now having more opportunities to build a career, dropping marriage rates, the spiralling cost of raising a child, and income lost when a pregnant woman's career is interrupted, according to the think tank, East-West Centre.

Poor fertility rates lead to an imbalance in the population, with older people forming a larger share. As of 2023, a third of the population was aged over 65 in Japan and by the early 2030s, the share of people aged over 65 will increase to 30% in South Korea and Hong Kong. Chart 3 shows the year when about 5%, 15%, and 30% of a country's population was or will be aged over 65. While countries took many years to reach the 15% mark from 5%, they are estimated to reach the 30% mark in a relatively quicker manner, indicating the rapid ageing of the population.



## AI-GORITHM: GENAI PROMISES A BOOSTER DOSE FOR INDIAN PHARMA TO SCALE UP THE VALUE GAME

Artificial Intelligence, particularly Generative AI, could be a transformative tool for pharma companies that promises to significantly impact drug development in an industry that has witnessed limited progress in recent decades. For the Indian pharmaceutical industry, a traditional production hub for generic medicines and low-cost vaccines which, while holding the third position globally in volume terms, comes in at a dismal 14th place globally when ranked in terms of the value of its pharmaceutical production. GenAI offers a particularly promising template for Indian pharma to orchestrate a much-needed scale up across the value chain.

The limitations faced by the Indian pharma industry in making breakthroughs in new drug discovery is linked to the general lack of resources to compete with drug majors from the United States and Europe and the fact that most companies struggle to progress a drug beyond Phase II clinical research.

China, which is largely in a similar situation as India as far as new drug discovery goes, has managed to make a breakthrough using AI, with Hong Kong-based biotech startup Insilico Medicine creating the first fully Gen AI drug to advance to human clinical trials, where AI was leveraged throughout the preclinical drug discovery process to identify a molecule target, generate novel drug candidates, assessment of binding efficacy with the target, and prediction of clinical trial outcomes. There are others pharma majors who have tasted early success while wielding AI as a tool:

Massachusetts Institute of Technology researchers have unearthed a potent new antibiotic compound capable of treating infections caused by drug-resistant bacteria – the first new antibiotic discovery in the last 60 years. Facilitating the identification of this compound was a machine-learning algorithm, surpassing traditional experimental approaches by rapidly screening over a hundred million chemical compounds.

Merck and Pfizer are among the other pharma majors actively leveraging Gen AI. Merck uses its proprietary platform, AIDDISON to help in drug discovery, while Pfizer now employs Gen AI-powered chatbots to deliver personalised messages to clinical trial participants.

In India, too, biotech incubators and pharma start-ups have started to experiment with Gen AI applications in highly targeted therapies. The process, though, needs policy support, given that in India, the links between industry and academia are tenuous compared to the Western markets.

The biggest tool for drug discovery could be AlphaFold — an AI trained by Google arm DeepMind to predict protein structures. Given that a protein's function is determined by how its constituent amino acid chains fold up into three-dimensional shapes, knowing a protein's structure can help potentially alter its behaviour by introducing a drug that binds to the protein. The traditional methods for determining a protein's structure have limitations – being slow, capital intensive, and complicated – with the result that researchers had only mapped the structure of less than 20% of the human body's 20,000 proteins till end-2022. AlphaFold promises to solve this “protein folding problem”, but predicting the points where folds would be optimum.

Another promising tool is chip major Nvidia's BioNeMo tool, a generative AI platform that provides services to pharma companies to develop, customise and deploy foundation models for



drug discovery and enabling scientists to integrate generative AI to reduce experiments and, in some cases, replace them altogether.

Nvidia-backed Recursion Pharmaceuticals, an American company based in Utah, cites AlphaFold as an “incredibly important and powerful advancement in the field” that many biopharma companies, including Recursion, are using for drug discovery. “The protein structures derived from the AlphaFold database were critical to our ability to predict the protein target for approximately 36 billion chemical compounds in the Enamine REAL Space (a chemical database that currently contains over 13 billion virtual compounds), which we announced last August. This was a massive virtual drug-target screen that was made possible, in part, by AlphaFold,” Recursion’s spokesperson Taran Loper told The Indian Express.

“It’s important to note that we’re not treating AlphaFold’s predictions as truth; we’re treating them as hypothesis-generation tools that we can then experimentally validate. AlphaFold is one tool (among many) to expand the vast search space of biology and chemistry and prioritise the most interesting insights to explore further, which is a philosophy that underpins how we use tools and technologies at Recursion. And yes, these models are improving quickly!,” Loper said.

Apart from Recursion, Nvidia already has announced a couple of other Big Pharma partnerships last year. Amgen and Roche subsidiary Genentech have both incorporated BioNeMo into their workflows.

For India, this could be of particular relevance in scaling up the value chain, driving innovation, and fostering a resilient ecosystem. “GenAI is revolutionising the health sciences sector in India. In the realm of patient care, it is significantly impacting the patient journey by empowering patients to better manage their conditions, help in making decisions and overall, a seamless patient-doctor interface... it is imperative to underscore the importance of data governance and management. As we embrace these technological advancements, ensuring data privacy and compliance with regulatory requirements must remain a top priority,” according to Suresh Subramanian, Partner and National Life Sciences Leader, EY Parthenon India. EY India’s Gen AI report has projected that GenAI could contribute \$4-5 billion addition to the Gross Value Added (GVA) of the Indian pharma sector by 2030.

## HOW DOES HYDROCARBON EXTRACTION HAPPEN?

Over millennia, mighty geological processes in the earth’s crust heated and compressed together pieces of life-forms that had been dead for a while. Eventually, this mulch of organic matter accumulated as hydrocarbons inside rock formations. The two Industrial Revolutions were the result mainly of people finding a way to extract these hydrocarbons and using them to drive many great engines, whose foul breath polluted the air and water and eventually gave us global warming.

### **Where are hydrocarbons located?**

The most common forms in which these hydrocarbons exist in subterranean rock formations are natural gas, coal, crude oil, and petroleum. They are usually found in underground reservoirs created when a more resistant rock type overlays a less resistant one, in effect creating a lid that causes hydrocarbons to accumulate below it. Such formations are important because otherwise, the hydrocarbons would float to the surface and dissipate.



Experts use the tools, methods, and techniques of the field of petroleum geology to assess these rocks, including to check for their porosity and permeability. If a rock formation is highly porous, it could hold a larger quantity of hydrocarbons. Similarly, the more permeable a rock is, more easily the hydrocarbons will flow through it. The primary source of hydrocarbons in this rocky underground is called kerogen: lumps of organic matter. Kerogen can be deposited from three possible sources: as the remains of a lake (lacustrine), of a larger marine ecosystem, or of a terrestrial ecosystem. Rocks surrounding the kerogen can become warmer, more compact over time, exerting forces on the kerogen that cause it to break down. Lacustrine kerogen yields waxy oils; marine kerogen, oil and gas; and terrestrial kerogen, light oils, gas, and coal. The rock containing the kerogen is called the source rock, and petroleum geologists are tasked with looking for it, understanding its geophysical and thermal characteristics, and characterising its ability to yield hydrocarbons. They also undertake modelling activities informed by observational data and dig smaller exploration wells to estimate the amount of hydrocarbons there, and report it to the relevant regulatory body.

Once a particular location is determined to be a profitable source of hydrocarbons, drilling can begin.

#### WHAT'S BEHIND HEAVY RAINFALL IN DUBAI

The United Arab Emirates (UAE) recorded the heaviest rain ever after a severe thunderstorm hit the country on Monday (April 15) late night, killing at least one person, causing damage to homes and businesses, and bringing air travel to a standstill in Dubai.

According to the state-run WAM news agency, the rain was “a historic weather event” that surpassed “anything documented since the start of data collection in 1949” – that was before the UAE was established in 1971.

Heavy rains are unusual in the UAE, which is an arid, Arabian Peninsula country. However, they occasionally occur in the region during cooler winter months.

#### What happened in Dubai?

The thunderstorms began on Monday night and by Tuesday evening had dumped more than 142 millimetres (mm) of rain onto the desert city of Dubai. Usually, the city witnesses this much rain in a year and a half. An average year sees 94.7 millimetres of rain at Dubai International Airport — the world’s second busiest airport, which recorded more than 80 million visitors in 2023.

The heavy rains led to disruption of air travel as flights were either diverted or delayed. According to airport authorities, operations were temporarily suspended for 25 minutes on Tuesday afternoon. Although heavy rains calmed down by late Tuesday, disruptions continued to Wednesday. The UAE’s neighbour, Oman, also received a severe downpour, which killed 18 people, including “some 10 school children [were] swept away in a vehicle with an adult,” the AP reported.

#### What led to the heavy rains in Dubai?

The primary reason for these heavy rains was a storm system, which was passing through the Arabian peninsula and moving across the Gulf of Oman.



According to a different report by the AP, rains could have been exacerbated by cloud seeding, a process of spraying salt mixtures in clouds that would result in condensation of the cloud and eventually cause rainfall.

“Several reports quoted meteorologists at the National Center for Meteorology as saying they flew six or seven cloud-seeding flights before the rains,” according to the AP report.

#### **Is climate change responsible for the event?**

Some experts have suggested that the soaring global temperatures could also be behind the event. Higher temperatures cause evaporation of water not only from land but also oceans and other water bodies, meaning a warmer atmosphere holds more moisture. Studies have found that for every 1 degree Celsius rise in average temperature, the atmosphere can hold about 7% more moisture. This makes storms more dangerous as it leads to an increase in precipitation intensity, duration and/or frequency, which ultimately can cause severe flooding.

Studies based in India’s Thar desert and Australia’s desert regions have shown that climate change could lead to more rainfall in these areas.

While the average global temperature on the Earth has increased by at least 1.1 degree Celsius since 1850, the UAE has witnessed an increase of almost 1.5 degree Celsius in the past 60 years. The increase in temperatures is mainly caused by the rise of heat-trapping greenhouse gas (GHG) emissions since the Industrial Revolution.

However, it is extremely difficult to attribute any particular extreme weather event to climate change. It is because there are multiple factors, like patterns of natural climate variability, such as El Niño and La Niña, that contribute to such events.

### **UNCERTAIN TIMES**

In a world where global warming and climate change have become buzzwords, everything seems to be in a flux. There’s either a deluge or a drought. Disasters like forest fires and floods seem to be increasing in frequency, pushing vulnerable people to the edge.

This month, extensive flooding impacted the Central Asian regions of Kazakhstan and Russia, specifically in the Ural Mountains and Siberia. The Ural river, which rises in the Ural mountains and flows through Kazakhstan into the Caspian Sea, burst through embankment dams in the Urals city of Orsk on April 5 and flooded parts of the city of Orenburg.

At least 12,000 people in Russia are recorded as having been evacuated. In Kazakhstan, more than 97,000 people have been evacuated. The worst hit areas mostly border Russia and are crossed by rivers flowing from or to Russia.

In a 2009 research commissioned by the U.S. National Intelligence Council on the impact of climate change on Russia to 2030, the authors said the rise in temperatures would lead to a series of complex issues for Russia.

Among them were the increased frequency of extreme climatic events including heavy rain, fires in Siberian peatlands and more frequent flooding of Russia’s Arctic rivers due to heavy rain and earlier break-up of river ice.



The European Union's climate change monitoring service recently said that March 2024 was the warmest on record. Each of the last 10 months ranked as the world's hottest on record, compared with the corresponding month in previous years, the EU's Copernicus Climate Change Service (C3S) said in a monthly bulletin. The 12 months ending with March also ranked as the planet's hottest ever recorded 12-month period, C3S said.

Extreme weather and exceptional temperatures have wreaked havoc this year. Wildfires affecting Mexico have destroyed over 3,000 hectares of forested areas. Heatwaves in Vietnam have caused severe drought in central Ninh Thuan province, badly affecting vegetation and livestock.

Closer home, the India Meteorological Department has said the country will see more than the average number of heatwave days this year between April and June. Heat waves can be lethal as they affect the ability to breathe, making the old and young particularly vulnerable.

Benjamin Horton, director of the Earth Observatory of Singapore where natural phenomena such as climate change are studied, said three factors determine heat waves; El Nino, a natural, temporary and occasional warming of part of the Pacific, an increase in global temperatures and human-induced climate change.

### THREE NEW FISH SPECIES SPOTTED USING TOOLS IN THE LACCADIVE SEA

Three fish species that live in the Laccadive Sea, off the southwest corner of the Indian coast, are capable of using tools, we recently found.

All three species used live or dead coral structures as anvils to break the hard shells of sea urchins so they could get to the edible bits inside. The Jansen's wrasse (*Thalassoma janseni*) and the checkerboard wrasse (*Halichoeres hortulanus*) have never been reported using tools before, and this is the first documented instance of the moon wrasse (*Thalassoma lunare*) using tools in the wild.

Our study was published in the journal *Coral Reefs* in February. It adds to the growing number of reports of tool-use in animals. While the sophistication of human tool use, from flints to computers, distinguishes us from other animals, the use of tools itself is more common than scientists first imagined.

Reports of animals like chimpanzees using straws to draw water and crows fashioning leaves to extract insects from crevices are well known whereas reports of aquatic animals using tools have been far less common. This is partly because they are much more difficult to observe and because of the perception that species like fish are 'less intelligent'. So scientists have thought they are less likely to be capable of complex cognitive tasks.

### WHEN THIS TINY FROG IN BRAZIL SCREAMS, YOU WON'T HEAR IT

Frogs use a myriad ways to defend themselves against predators. Some are poisonous. Some are brightly coloured. Some even inflate their bodies with air to appear bigger.

Another way frogs have been known to defend themselves, or alert others nearby, about a predator is to make loud sounds.

Recently, scientists have found that one tiny species of frog endemic to the Brazilian Atlantic rainforest emits ultrasonic sounds that are inaudible to humans but can scare off predators.





In their work, published in the journal *Acta Ethologica* earlier this year, Brazilian scientists from the Institute of Biology, São Paulo, and the Project Dacnis preserve recorded the ultrasonic 'screams' of the tiny leaf litter frog (*Haddadus binotatus*) while in the rainforest of Brazil.

The researchers found that the frog — which is smaller than an inch — while emitting the scream would raise the upper portion of its body, open its mouth wide, and throw its head back. This behaviour was, they said, was a typical defensive movement against predators.

The frog would then close its mouth just a little and appear to emit a call.

However, the researchers did not hear any sounds.

They subsequently used specialised equipment to check for the presence of a call, and found that the frog was screaming at a frequency much higher than humans could hear.

After analysing the call, they ascertained that the call's frequency spanned the 7 kHz to 20 kHz range, which is within humans' hearing range, but also reached up to 20 kHz to 44 kHz, which is beyond what the human ear can discern.

Researchers think leaf litter frogs emit these ultrasonic calls to stave off predators or, possibly, attract other animals that might attack the predator and protect the frogs.

One of the scientists involved in this study, Mariana Retuci Pontes, had previously suspected the frogs used ultrasonic screams as a defence mechanism after she had come across what looked like a Hensel's big-headed frog (*Ischnocnema henselii*) in Brazil's rainforests.

When she picked up this frog to photograph it, it made defensive movements that resembled those of the leaf litter frog. However, she did not have the equipment to record its calls on hand at the time and could not tell if they were ultrasonic.

The finding that the leaf litter frog emits ultrasonic sounds has kicked up questions for the researchers about which predators are affected by the screams, how they react to it and what the scream's ultimate purpose is.

## CRYOGENICS: KEEP IT CHILL

### WHAT IS IT?

Cryogenics is the science of materials at temperatures below negative 153 degrees C. The technologies by which materials are cooled up to this temperature are collected under the term refrigeration. Instead, cryogenics deals with thermal conditions in which even the substances that we encounter in our daily lives as gases — such as hydrogen, nitrogen and, of course, the air in our atmosphere — are liquid.

This field typically uses helium and nitrogen as the cryogenic fluid, the thing that cools a substance. Nitrogen has a boiling point of negative 196 degrees C, and helium, negative 269 degrees C. So below these temperatures, they are liquid. Such fluids need to be stored in vacuum flasks or they could leak and damage their surroundings.

Many cryogenic materials have desirable properties. For example, hydrogen is one of the best rocket fuels but it can only be used as a liquid, so it needs to be cryogenically cooled. (Cryogenic hydrogen and cryogenic oxygen power the third stage of ISRO's LVM-3 rocket.) In the process of



cryogenic hardening, a material — steel in particular — can be made harder and stronger. This is because as it is cooled to around negative 185 degrees C, more of the steel's crystal structure acquires the martensite configuration. Magnetic resonance imaging (MRI) devices used in medical diagnostics use cryogenic fluids to cool their magnets.

## ECLIPSES: FROM FLEETING TO FREQUENT

**Q: What are the frequencies of solar and lunar eclipses?**

A: A solar eclipse, especially a total one, can be seen from only a limited part of the earth, while the eclipsed moon can be seen at the time of the eclipse wherever the moon is above the horizon.

In most calendar years there are two lunar eclipses; in some years one or three or none at all occur. Solar eclipses occur two to five times a year. Five is exceptional. There were five solar eclipses in 1935 and will be again in 2206.

The average number of total solar eclipses in a century is 66 for the earth as a whole, according to the New Encyclopaedia Britannica.

Any point on the earth may, on the average, experience no more than one total solar eclipse in three to four centuries.

The situation is quite different for lunar eclipses. An observer remaining in the same place can see 19 or 20 lunar eclipses in 18 years. A total lunar eclipse can last as long as an hour and three-quarters, for a solar eclipse, the maximum duration of totality is only seven and a half minutes.

This difference results from the fact that the moon is much smaller in cross section than the extension of the earth's shadow but can be only a little greater in apparent size than the Sun.

## EVOLUTION OF EYES

**Is there any evidence that eyes have evolved several times independently of one another?**

Scientists have discovered a bristle worm with such sharp-seeing eyes that they can measure up to those of mammals and octopuses. The Vanadis bristle worm, also known as polychaetes which are nocturnal, has eyes as big as millstones, relatively speaking. As a set, the worm's eyes weigh about twenty times as much as the rest of the animal's head. Its eyesight is on a par with that of mice or rats, despite being a relatively simple organism with a minuscule brain. These worms see ultraviolet light. This may indicate that the purpose of its eyes is to see bioluminescent signals in the otherwise pitch-black night time sea. Vanadis' eyes are built simply, but equipped with advanced functionality. They have evolved in a relatively short evolutionary time span of just a few million years. This means that they must have developed independently of, for example, human eyes and that the development of vision, even with a high level of function, is possible in a relatively short time.



## NESTLÉ'S BABY FOOD SOLD IN ASIAN, AFRICAN COUNTRIES HAD ADDED SUGARS: WHY IS SUGAR HARMFUL?

Nestlé's products for babies in Asia, Africa and Latin America were found to contain added sugars, while the same products sold in Europe did not have it, according to a recent report.

This included the world's biggest baby cereal brand Cerelac, which reportedly contained added sugars that averaged nearly 3 grams per serving when sold in Indian markets. Sugar is generally not recommended for infants, although guidelines in several developing countries do not explicitly prohibit it.

Public Eye, a Swiss organisation that undertakes investigations, public advocacy and campaigns, published the report in collaboration with the International Baby Food Action Network (IBFAN). It was based on tests on Nestlé products that were conducted in a Belgian lab.

A Nestlé India spokesperson told The Indian Express that in the last five years, the company has "reduced added sugars by up to 30 per cent, depending on the variant, in our infant cereals portfolio (milk cereal based complementary food)." What exactly did the report say about Nestlé, and why is added sugar harmful – particularly for babies? We explain.

### What the report says on Nestlé

The report ('How Nestlé gets children hooked on sugar in lower-income countries') faulted Nestlé for employing different nutritional standards in its offerings, depending on the country it served. Nestlé also did not make the quantity of sugar content clear on the products' packaging, it said.

"Nestlé's leading baby-food brands, promoted in low- and middle-income countries as healthy and key to supporting young children's development, contain high levels of added sugar. In Switzerland, where Nestlé is headquartered, such products are sold with no added sugar."

If Nestlé products are not as nutritious as they seem to parents, it also has risks for children. Currently, Nestlé controls 20 percent of the baby-food market, valued at nearly \$70 billion, according to Public Eye. It said the findings shed light on "Nestlé's hypocrisy and the deceptive marketing strategies deployed by the Swiss food giant".

"For example, in Switzerland, Nestlé promotes its biscuit-flavoured cereals for babies aged from six months with the claim 'no added sugar', while in Senegal and South Africa, Cerelac cereals with the same flavour contain 6 grams of added sugar per serving," said the report.

Similarly, Cerelac, which is meant for six-month-old babies, has no added sugars in Germany and the United Kingdom but contains over 5 grams per serving in Ethiopia and 6 grams in Thailand.

India's food safety regulator, Food Safety and Standards Authority of India (FSSAI), did not comment on the report. However, government officials said the lab reports of the samples from India will be sought, which will then be examined by the FSSAI's subject expert committee.

### Why are added sugars harmful?

Sugar is a simple carbohydrate. Some food items have sugar that is naturally occurring. According to the American Heart Association (AHA), it is "found in milk (lactose) and fruit (fructose). Any product that contains milk (such as yogurt, milk or cream) or fruit (fresh, dried) contains some natural sugars."



Free sugar or added sugar is added separately to a food item during preparation or processing. It can “include natural sugars such as white sugar, brown sugar and honey, as well as other caloric sweeteners that are chemically manufactured (such as high fructose corn syrup),” the AHA says.

Public Eye reported that Nestlé’s baby food products with added sugars are “permitted under national legislation (of some countries) despite the fact that they go against World Health Organisation guidelines.”

In 2015, the WHO’s guideline recommended that “adults and children reduce their daily intake of free sugars to less than 10% of their total energy intake.” It would be even healthier to consume less than 5% (roughly 25 grams per person a day) of free sugars, it said.

Sugar consumption is supposed to be kept limited for health reasons. Excessive consumption can lead to increased overall energy intake in a person’s overall diet. It may be at the cost of food items having nutritionally adequate calories, eventually leading to an unhealthy diet. The risks of contracting non-communicable diseases, such as diabetes, obesity and heart-related ailments, are then increased.

Rodrigo Vianna, epidemiologist and Professor at the Department of Nutrition of the Federal University of Paraíba in Brazil, told Public Eye: “Sugar should not be added to foods offered to babies and young children because it is unnecessary and highly addictive. Children get used to the sweet taste and start looking for more sugary foods, starting a negative cycle that increases the risk of nutrition-based disorders in adult life.” Tooth decay is also associated with early exposure to sugar.

What adds to concerns is the fact that low- and middle-income countries are increasingly being exposed to free sugars with growing incomes and the proliferation of giant global food brands that mass produce their products.

A 2017 report from the WHO (‘Incentives and disincentives for reducing sugar in manufactured foods’) said, “The fact that sugar is a relatively cheap and abundant ingredient is not a direct incentive to use it, but means there is little incentive from the supply side not to use it.” Adding sugar to a food item often makes it more palatable, meaning consumers will opt for it repeatedly.

A UNICEF-supported study from December 2023 found that of the 1,600 infant cereals, snacks and ready-to-eat meals marketed at young children in Southeast Asia, nearly half of the products (44 per cent) included added sugars and sweeteners.

WHO advises against the introduction of added sugars before the age of 2. A 2019 WHO study on baby foods also found that many products have “inappropriately high levels of sugar”.

“It’s important to recognise that babies have an innate preference for sweet tastes but the key is not to reinforce that preference and to expose them to a variety of different flavours and food textures,” Professor Mary Fewtrell, then nutritional lead, Royal College of Paediatrics and Child Health had told the BBC.

## GEROSCIENCE: THE SCIENCE RELATED TO AGING

Dr. Daniel Belsky, an epidemiologist at Columbia University, New York (my Alma Mater), has coined the term ‘geroscience’, meaning geriatric, or related to age. Here, he has devised a novel blood test which determines the pace at which a person is aging. His group has devised a method



which studies the formation of methyl groups through an enzyme in the DNA of senior citizens and finds that this methylation is sensitive to aging. This is often referred to as 'gerozyme'.

#### **Tool to target aging**

Several groups are working on drugs and other related methods to modulate the gerozyme, and how these efforts affect his/her aging. One group has suggested the drug called metformin is a tool to target aging (Cell Metabolism, vol.23, June 14, 2016). Another group has shown that if we inhibit the enzyme TORC1, it will enhance immunity and reduce infection in the elderly. More recently, Mannick et al, in a paper in Nature Aging(2023) have reviewed the effects of the drug rapamycin on the longevity and survival of animal models of human diseases, and how we may make the drug's inhibitors a part of the standard of care for diseases of aging.

Dr. Belsky's group had also studied the levels of DNA methylation in people across the socio-economic backgrounds (poor-rich, rural-urban) and found that the socio-economic disadvantage has a role to play.

The Columbia Aging Centre has found that a balanced diet supports brain health by reducing inflammation, and promotes proper blood flow by supplying essential nutrients which aid cognitive function.

The website healthline.com elaborates on this and states that healthy sources of proteins, healthy fats, and foods rich in antioxidants, such as healthy fats, vegetables, foods rich in oils, and plenty of fruits help in supporting healthy aging. This is of particular value to us in India, since the number of people above the age of 60 years is about 10 crores (out of a total population of 143 crores). Healthline.com suggests that proteins (animal and vegetable), nutritive grains (wheat, rice, ragi, bajra), oils, fruits and soft drinks help in healthy aging. These are easily available, both for meat eaters and vegetarians.

Researchers at Stanford University have found that a drug which can boost strength in injured or aging mice restores connections between nerves and muscle fibres. This drug blocks the activity of an aging-associated gerozyme called 15-PGDH which naturally increases in muscles with age and in neuromuscular disease. But with this drug, aging mice become physically active again.

Mayo Clinic in Minnesota offers seven benefits of regular physical activity. These are: controls weight; combats health conditions and diseases like stroke, high blood pressure, type 2, diabetes, and cancer; improves your mood; boosts energy; enables better sleep; better sex life; and finally, it can be fun and social such as meeting, walking, or playing with others.

All of us, particularly senior citizens, will greatly benefit by exercise, and thus inhibit the gerozyme.

#### **Music may even modulate gerozyme and be a cure for dementia!**

In 2020, a group from Toledo, Spain published a paper which concluded that music can be a powerful treatment strategy for dementia. And more recently, another group, again from Spain, has a paper titled: Music compensates for altered gene expression in age-related cognitive disorders. In effect, the paper suggests that music can modulate our gerozyme. So, friends! Sing a song or turn the music on!



## WHY IS THERE A WHO ALERT ON VIRAL HEPATITIS?

### The story so far:

India accounted for 11.6% of the total viral hepatitis disease burden globally in 2022, making it the country with the second highest disease load after China, according to the World Health Organization's (WHO) Global Hepatitis Report 2024 released recently. Bangladesh, China, Ethiopia, India, Indonesia, Nigeria, Pakistan, the Philippines, the Russian Federation and Vietnam, collectively shoulder nearly two-thirds of the global burden of hepatitis B and C.

### What does the report highlight?

As per the report, the disease is the second leading infectious cause of death globally — with 1.3 million deaths per year, the same as tuberculosis, a top infectious killer. New data from 187 countries show that the estimated number of deaths from viral hepatitis increased from 1.1 million in 2019 to 1.3 million in 2022. Of these, 83% were caused by hepatitis B, and 17% by hepatitis C. Every day, there are 3,500 people dying globally due to hepatitis B and C infections. Half the burden of chronic hepatitis B and C infections is among people aged 30-54 years old, with 12% among children under 18 years of age. Men account for 58% of all cases.

### What is hepatitis?

"Hepatitis is an inflammation of the liver that is caused by a variety of infectious viruses and non-infectious agents leading to a range of health problems, some of which can be fatal," says Sharad Malhotra, HOD, Gastroenterology Hepatology and Therapeutic Endoscopy, Aakash Healthcare, Delhi. There are five main strains of the hepatitis virus, referred to as types A, B, C, D and E. While they all cause liver disease, they differ in important ways including modes of transmission, severity of the illness and geographical distribution. In particular, types B and C lead to chronic disease and together are the most common cause of liver cirrhosis, liver cancer and viral hepatitis-related deaths. An estimated 354 million people worldwide live with hepatitis B or C, and for most, treatment remains beyond reach, according to the WHO.

### Why is India vulnerable?

Doctors attribute the large number of cases to several reasons including high population density, lack of awareness to symptoms, screening and treatment and not adhering to or having access to good hygiene practices.

Dr. Sudeep Khanna, senior consultant, gastroenterologist, Indraprastha Apollo Hospitals, explained that one of the major reasons for the increasing burden of hepatitis in India is the high prevalence of chronic viral hepatitis B and C infections. "These chronic infections often remain asymptomatic for decades; furthermore, the lack of widespread screening programmes and limited awareness about the importance of hepatitis testing contribute to a significant proportion of cases going undiagnosed. Undiagnosed cases continue to transmit the infection, perpetuating the cycle of transmission and leading to a rise in the overall burden of the disease," he said. The physician added that another important factor contributing to the rising number of hepatitis cases is the increasing prevalence of non-viral forms of the disease, such as alcoholic liver disease (ALD) and non-alcoholic fatty liver disease (NAFLD). Doctors note that the high consumption of alcohol, particularly in urban areas, has led to a significant increase in ALD cases. Additionally, the rapid rise in obesity and metabolic disorders, coupled with sedentary lifestyles and dietary changes, has



fuelled an epidemic of NAFLD in both urban and rural populations. These conditions can progress to more severe forms of liver disease further compounding the burden of hepatitis in India.

Men report larger number of cases. Manoj Gupta, HOD, Liver Transplant and GI Surgery, PSRI Hospital, Delhi, states that this is due to high-risk behaviour like use of IV drugs, sharing injections while using IV drugs and sexual behaviour. "Multiple sex partners, or male to male sex is a very high-risk factor for these hepatitis B and C infections," he said.

#### **How can it be prevented?**

Hepatitis B can be prevented through vaccination and the report highlights the need to ensure coverage, while hepatitis C is curable with medicines. In India, the numbers of deaths due to viral hepatitis aren't comparable to tuberculosis, say experts, adding that cost of treatment is also among the lowest as India makes the generic version of the drugs. Also, the government's viral hepatitis control programme offers the vaccine to high-risk adults such as healthcare workers. Treatment for both hepatitis B and C is available under the programme. With an initial rollout of the hepatitis B vaccine in certain cities and districts of India in 2002-2003, the Indian Government included Chronic Hepatitis B infection (HBV) vaccine in the childhood immunisation programme in 2011-12.

#### **Why is the report significant?**

This is the first consolidated WHO report on the viral hepatitis epidemiology, service coverage and product access, with data for action. This report presents the latest estimates on the disease burden and the coverage of essential viral hepatitis services from 187 countries across the world. It also found that across all regions, only 13% of people living with chronic hepatitis B infection had been diagnosed, and approximately 3% (7 million) had received antiviral therapy at the end of 2022. Regarding hepatitis C, 36% of people had been diagnosed and 20% (12.5 million) had received curative treatment. These results fall well below the global targets to treat 80% of people living with chronic hepatitis B and hepatitis C by 2030. However, it does indicate slight but consistent improvement in diagnosis and treatment coverage since the reported estimates in 2019.

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

Mother to child transmission is responsible for most new infections, and in India, elimination of hepatitis B requires extensive treatment coverage, immunising and protecting every newborn and ending any discrimination against patients, said Dr. S.K. Sarin, Vice-Chancellor, Institute of Liver and Biliary Sciences, Delhi. The report cautions that despite the availability of affordable generic viral hepatitis medicines, many countries fail to procure them at lower prices. Pricing disparities persist both across and within WHO regions, with many countries paying above global benchmarks.

The report adds that service delivery remains centralised and vertical, and many affected populations still face out-of-pocket expenses for viral hepatitis services. It has outlined a series of actions to advance a public health approach to viral hepatitis, designed to accelerate progress towards ending the epidemic by 2030. This must look at expanding access to testing and diagnostics, shifting to policies for equitable treatment, strengthening prevention efforts and improved funding both at a global level or within countries' health budgets, said WHO.



## THE DYNAMIC DUO: ENHANCED LIVER FUNCTION AND GUT HEALTH

In the intricate ecosystem of our bodies, two unsung heroes often overlooked are the liver and the gut. While the liver diligently detoxifies, metabolises, and stores nutrients, the gut orchestrates digestion and plays a pivotal role in our immune system. However, the connection between these two vital organs goes deeper than meets the eye. In this article, we delve into the symbiotic relationship between liver function and gut health, shedding light on how nurturing one benefits the other.

### Understanding liver function

The liver, often hailed as the body's powerhouse, boasts a repertoire of functions crucial for our overall well-being. Primarily, it detoxifies harmful substances, be it environmental toxins or metabolic byproducts, ensuring our bloodstream remains clean. Additionally, the liver synthesises essential proteins, stores glycogen for energy, and metabolises fats, carbohydrates, and proteins, thereby regulating blood sugar levels and cholesterol. However, this multitasking marvel isn't invincible. Factors such as excessive alcohol consumption, poor dietary choices, viral infections, and certain medications can burden the liver, impairing its function. Over time, this strain may lead to liver diseases such as fatty liver disease, hepatitis, or even liver cirrhosis.

### The Gut: gateway to health

Traversing down the digestive tract, we encounter another protagonist: the gut. More than a mere passageway for food, the gut hosts trillions of microorganisms collectively known as the gut microbiota. This bustling community aids in breaking down food, synthesising vitamins, and, crucially, bolstering our immune system. Maintaining a diverse and balanced gut microbiome is pivotal for overall health. However, modern lifestyles, marked by processed foods, antibiotics, and chronic stress, often disrupt this delicate equilibrium, paving the way for gastrointestinal disorders like irritable bowel syndrome (IBS), inflammatory bowel disease (IBD), and leaky gut syndrome.

### The Interplay: liver-gut axis

Now, let's unravel the intricate interplay between the liver and the gut, often referred to as the liver-gut axis. This bidirectional communication system involves various molecules, hormones, and immune cells shuttling between the two organs, influencing each other's function. One crucial link is the bile produced by the liver, which aids in fat digestion. Interestingly, bile acids also act as signalling molecules in the gut, modulating the composition of the gut microbiota. Conversely, metabolites produced by gut bacteria can influence liver metabolism and inflammation. Moreover, a healthy gut microbiome contributes to the integrity of the gut barrier, preventing harmful substances from leaking into the bloodstream and burdening the liver. Conversely, a compromised gut barrier, as seen in conditions like leaky gut syndrome, can trigger systemic inflammation and liver dysfunction. Given their intertwined relationship, fostering gut health emerges as a promising avenue to bolster liver function. Here are some strategies to optimise both:

Embrace a fiber-rich diet — fiber-rich foods like fruits, vegetables, whole grains, and legumes serve as prebiotics, nourishing beneficial gut bacteria. Moreover, soluble fiber binds to bile acids, aiding in their excretion and reducing cholesterol levels, thus alleviating the liver's workload. Incorporating probiotic-rich foods like yogurt, kefir, and kimchi introduces beneficial bacteria





into the gut, fostering a diverse microbiome. These microbes can metabolise bile acids and modulate inflammation, indirectly benefiting liver health.

**Limit sugar and processed foods:** Excessive sugar and processed foods not only disrupt the gut microbiota but also contribute to fatty liver disease and insulin resistance. Opting for whole, unprocessed foods help maintain gut integrity and liver health.

**Stay hydrated:** Adequate hydration supports liver function by aiding in the elimination of toxins through urine and optimising bile production for digestion.

**Manage stress:** Chronic stress can wreak havoc on gut health by altering gut permeability and microbiota composition. Prioritising stress management techniques like meditation, yoga, or deep breathing exercises can mitigate its adverse effects.

In the intricate tapestry of human physiology, the liver and gut stand as pillars of health, closely intertwined in their functions. By nurturing gut health through mindful dietary choices, stress management, and probiotic support, we can bolster liver function and pave the way for vibrant well-being. Let's embark on this journey towards enhanced liver function and gut health, celebrating the dynamic duo that fuels our vitality.

## RANDOMISED CONTROL TRIALS: THE TECHNIQUE THAT TRANSFORMED TB CARE

Kamala's privileged social background could not save her. A stark reminder of the disease's indiscriminate nature. At the time, Nehru was confined to a colonial prison, a helpless, distant spectator to his wife's battle with TB. His shackles prevented him from being by her side. In a cruel twist of fate, the man who would become his greatest adversary in the political arena, M.A. Jinnah, too, ultimately met his end against the same relentless enemy that claimed Nehru's beloved, we later learnt. The untimely demise of these privileged individuals, along with millions around the globe, is a chilling testament to the lack of effective therapeutics against the dreaded disease, despite its causative agent being uncovered in 1882. Today, almost a century later, the narrative of TB treatment has dramatically transformed. We aspire to eliminate tuberculosis from the world by the end of this decade. This year (2024), the theme of World TB Day was "Yes, we can end TB." This was unimaginable for centuries. It is now possible because of the therapeutic regimen. A testament to medical advancements and a tribute to the tireless efforts of the medical community.

### Revolution in treatment

TB is an unyielding nemesis caused by *Mycobacterium tuberculosis*, which has existed for at least 3 million years. It has been a thorn in the side of humanity since the beginning of civilisation. Before antibiotics, TB treatments were largely palliative, offering fresh air and rest to patients in sanatoriums at high altitudes or tranquil countryside locations. Alternatively, surgical procedures like lobectomy, artificial pneumothorax (collapsing the lung), and pneumonectomy were performed by expert cardiothoracic surgeons. These treatment options, however, had limited success, and their efficacy was often questionable. The discovery of antibiotics by Sir Alexander Fleming marked the beginning of a new chapter in the fight against this persistent foe. However, the real revolution in TB treatment was brought on by the ground-breaking work of Sir Austin Bradford Hill. Hill's own bout with TB during World War I may have thwarted his aspirations to become a physician, but it didn't dampen his spirit. Hill made remarkable contributions to medical statistics. He pioneered the randomised control trial technique at the British Medical Research Council (BMRC). It led to one of the first randomised clinical trials to evaluate the efficacy of



antibiotics against TB. He is also credited with the establishment of early ethical guidelines for clinical trials that set a new standard for scientific integrity in medicine.

#### **Critical role in research**

Clinical trials performed using the randomisation technique have been instrumental in shaping modern medicine, providing a robust and unbiased method to evaluate the efficacy of various treatments and interventions. They have been the cornerstone of numerous medical breakthroughs, including the discovery of aspirin's role in preventing heart attacks, the development of antiretroviral therapy for HIV treatment, and the application of cognitive behavioural therapy for mental health conditions to the latest COVID vaccines. Hill's effective implementation of RCTs in testing streptomycin, the first antibiotic to prove effective against TB, was a game-changer. His meticulous work helped establish the optimal dosage of this life-saving drug, transitioning it from a lab discovery to a practical solution for TB. Hill's efforts redefined the management of TB, moving it from the exclusive domain of specialised surgeons to the broader realm of primary care physicians. Hill's contributions, however, went beyond TB.

His eponymous 'Bradford Hill Criteria' form the bedrock of modern epidemiology. The nine criteria — strength, consistency, specificity, temporality, biological gradient, plausibility, coherence, experiment, and analogy — provide a robust framework for establishing a causal link between a specific factor and a health effect. From establishing alcohol as a risk factor for cardiovascular diseases to the risks of sugar-sweetened beverages and obesity, the criteria served as a guiding principle for examining evidence in several areas. Hill's criteria were pivotal in establishing the link between smoking and lung cancer through a case-control study. His research provided irrefutable evidence, debunking the pseudoscience propagated by the tobacco lobby and causing a significant shift in public perception and policy towards tobacco.

#### **Debt of gratitude**

As we stand on the threshold of eliminating TB, even in the face of formidable challenges such as Multi-Drug Tuberculosis (MDR-TB) and Extensively Drug-Resistant Tuberculosis (XDR-TB), we owe a monumental debt of gratitude to Sir Austin Bradford Hill. His life and work serve as a testament to the power of scientific inquiry and resilience, continuing to inspire us as we aspire to achieve the ambitious goal of eradicating TB. Today, as we reflect on the past, let's honour the invaluable contributions of scientists like Sir Bradford Hill. In their tireless research and relentless pursuit of knowledge, they have carved pathways to incredible change. His work is a testament to the power of science to effect positive change, a legacy that continues to inspire researchers around the world.