

OUR TAKE

Battling caste in Tamil Nadu

Anti-Dalit violence in the state opens the underbelly of the Dravidian Movement

The idea of social justice has shaped politics in Tamil Nadu for over a century. Political parties that subscribe to E.V. Periyar's Ramasamy's anti-caste ideology have had an uninterrupted run in office since 1967. Yet, caste violence, mostly targeting Dalits and perpetrated by members of castes under the Other Backward Classes (OBC) category, continues to roll Tamil Nadu, highlighting not just the administrative failure of successive governments but also the ideological hypocrisy of parties subscribing to the Dravidian Movement that takes pride in its anti-caste roots. The latest incident comes from Tirunelveli in southern Tamil Nadu that boasts 90% literacy, where a 27-year-old Dalit software engineer was killed for allegedly being in a relationship with a woman from the Most Backward Caste community. The woman's parents are police sub-inspectors, and the killer is her younger brother. The district was in the spotlight two years ago when a Dalit school boy and his sister were attacked by their schoolmates. The MK Stalin government had then appointed a retired judge to investigate the matter. The exhaustive Justice Chandru report found shocking evidence of not just deep-rooted caste prejudice in institutions but also a reluctance by heads of institutions to even recognise the malaise, let alone act against it. Anecdotal evidence too suggests large-scale use of caste markers among students in educational institutions, reflecting the polarisation in society.

Dalits constitute close to 20% of the state's population and have become politically assertive in the past few decades. Improvement in educational standards and a shift towards service jobs have upset the traditional power relationship, triggering caste violence. Inter-caste marriages, especially when the girl is from a dominant caste, increasingly trigger a violent response, as witnessed in Dharmapuri (2012) and Udumalipettai (2016). Unfortunately, the administrative apparatus, including the law enforcement system, has often failed to rise above caste associations and enforce the rule of law. Political parties that invoke caste pride covertly and overtly are equally to blame. For the Dravidian majors — the DMK and the AIADMK, primarily — the anti-Dalit violence suggests the failure to transcend their core vote bases, which are OBC communities, and usher in a politics that can enable the annihilation of caste. This task has been left incomplete by parties that now view politics entirely through the prism of economic development and ignore social fault lines that call for intense ideological engagement. Tamil Nadu's crisis is also the result of its economic advancement and improvement in human development indices, and its solution lies in political parties reinventing a paradigm of social justice.

Gender revolution on the chessboard

A historic campaign at the FIDE Women's Chess World Cup could easily be just about the champion Divya Deshmukh and the runner-up Koneru Humpy, but for India, it is so much more. The triumph is a sign that the chess revolution in India transcends the gender divide. This achievement by the duo stands on the shoulders of those who came before them. It includes the Khadilkar sisters (Vasanti, Jayanti, Rohini), who emerged in the 1970s and won the first 10 women's national championships among them, demanding to compete alongside men. Bhagyashree Thipsay played a role in the '80s and early '90s, but it was Humpy herself who took it up more than a few notches, by becoming India's first female Grandmaster (GM) at 15 and establishing herself as one of the strongest female players in the world. Deshmukh's rise and success are a part of the modern chapter that has already seen women become gold medal winners at the 2024 Chess Olympiad in Budapest. This is a generation that thinks differently. While some of the previous generation viewed themselves as outsiders, the younger women GMs (R Vaishali and Deshmukh) not only want to dominate the women's game, but also take on men. That, in a world which sees few women challenging the top male players, is a sign of the goalposts shifting. GM D Gukesh became the world champion at age 18, and Divya won the Women's World Cup at 19 — both are the youngest in history to do so. Most of this generation of players, regardless of gender, have grown up playing in the same academies. The confidence that they can beat anybody in the world, perhaps, comes from there. It's simply a given.

Donald Trump's six traits as US president

He is a bilateralist. He is extractive. He is ideological. He is pragmatic. He has a particular relationship with money. He is all-powerful

Donald Trump has given the world a rather good sense of how he operates. Six features stand out. One, Trump is a strict bilateralist. That he didn't care much for multilateralism, except for the stage and attention it gave him, was well-known. But Trump weighs every country on its own merit, as he defines it, rather than as a part of a wider strategy or that particular country's role vis-à-vis another third country. The China relationship for him, therefore, is about what China brings to the table for him at this moment, not necessarily about what his own concessions would mean for the rest of the world — or even for America after five years. The India relationship is solely about what India brings to the table for him at this moment, not about what India can bring to the table vis-à-vis China now or in some distant future. The Pakistan relationship is similarly about what Pakistan can bring to the table for him at this moment, not about how it may or not complicate ties with India. The Ukraine relationship for him was

about what Ukraine could give him (a minerals deal and concessions on territory), not about the fact that withdrawing US support would strand Russia a win the Russia relationship right now for Trump is about what Russia can give him but is not giving him (peace in Ukraine for a pretty good deal); that's why the current anger with Moscow.

Two, Trump is extractive, not transactional as the lazy cliché goes. When he enters a negotiation, it is not about a give and take; it is predominantly about take, with a little bit of give. The terms of trade deals that he is striking with allies, from Europe to Japan, offer a stark illustration of what Trump is seeking and getting — massive foreign investments in America, huge purchases of American arms and energy and agricultural products, unprecedented access to for-profit markets and treatment for American companies. In turn, Trump hands you a 15% tariff, and makes it sound like a favour. How is he getting away? Because the US is very powerful and the costs of a retort to Trump are very high. And no one believes in the only other option, which is collective resistance: Every State wants to cut its own sweet unilateral deal with Trump.

Three, Trump is ideological. Don't underestimate the role of 'Make America Great Again' in him, or him in MAGA. No other contemporary figure can claim to have founded a modern

political movement and driven it to power in a democracy as complex as America. The movement may admittedly have had historical roots, but it is Trump's creation.

Its broad ideological pillars include restraint in international affairs and an end of American involvement in wars; fierce opposition to immigration and demographic changes underway in America; social conservatism on gender and sexuality; opposition to free trade, belief in tariffs and a commitment to regain American manufacturing strength; changing the pedagogy to wipe out American sins from history books; suspicion of religious minorities; utter disdain for the climate crisis; a strong pro-rich bias in policy and opposition to the welfare State; and a view that defines the US as a Christian nation. Think of a range of Trumpian laws, statements and executive orders and they fit into this framework.

Four, Trump is a pragmatist with clear priorities and won't let the base get in the way. And that is why he is often willing to go against his own ideological faith, while always coming back with another "win" on their agenda. Powerful figures in the base didn't want him to attack Iran; he went ahead for reasons of glory largely, but listened to that ideological voice with a calculated and limited operation. His base is highly suspicious of elites but Trump clearly feels the economic wins of a potential deal with Beijing — the only other country he truly seems to



Prashant Jha



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respect for its power — can offset that muted opposition. His base is against gay marriage; Trump diluted the opposition to same sex marriage in the Republican Party platform and has appointed America's first gay treasury secretary. His base wanted a national ban on abortion; he knew the rollback of Roe v Wade protections had cost the Republican Party women votes and didn't back the demand. His base wanted an even more radical weakening of social security and health legislations; he knew it would be electorally suicidal. And if Trump really does something that the largely White majoritarian base may not like, there is always more action against immigrants, legal or illegal, in some form, that he can unite them around.

Five, Trump has a particular relationship with money that comes from his ambitious days as an entrepreneur where the deal size mattered the most. This may take the form of a massive manufacturing investment announcement that can be sold as a political win. It may take the form of a massive investment in data centres with foreign partners that can be sold as a win. Or it may take the form of a big investment in his family business firm run

by his sons. It may take the form of a partnership with a crypto firm run by friends. It may take the form of real estate contracts in key cities in the world. It may take the form of his family members getting prime slots on television as anchors or running the conservative media ecosystem that swims in the same donor base. It may take personal or political form, and for him, it is the same.

And the Donald Trumpian trait is that he is all-powerful. Not bound by the exigencies of seeking another term, granted complete immunity by the Supreme Court, legitimised by an electorate that overlooked January 6 (when Trump's supporters attacked the Capitol in Washington after his defeat in the 2020 Presidential election), in control of his party's legislative wing, with dominance over all forms of domestic and global political media, unconstrained by norms, at the top of what remains the most dominant power the world has ever seen. And in the last six months, every day, Donald Trump has reminded the world of precisely that power.

Prashant Jha is a political analyst. The views expressed are personal.

India's imperatives for a national security strategy

As we watch, with justifiable pride, the steady march of India's GDP towards Olympian heights, we must also take care to comment on the concern, lest harsh reality be overtaken by euphoria.

First, a very large proportion of the GDP is contributed by the so-called informal or unorganised sector. Second, India's per-capita GDP is \$2,487, against the world average of \$13,710, placing it at the 136th position among 188 countries, as listed by a UN survey. The last and most serious issue of concern is growing inequality, with one study claiming the top 1% of India's population has cornered about 40% of its wealth.

Two off-beat statements, in this context, are: "A rising tide will lift all boats" and "The trickle-down effect will take care of everything". This author is not an economist, and, therefore, unable to comment on the validity of these prophecies, but there is no gaining saying that steady economic growth is the only panacea for most of India's ills.

It would, however, be delusory to assume that India's rise is guaranteed, and that it is pre-destined to attain "great power" status by 2047.

The reality is that to achieve its full potential, India requires a strategic approach that integrates prudent economic policies with a robust security framework, anchored in inclusive and empathetic politics. Above all, we must face the fact that India needs peace and tranquillity, since not only are wars expensive, they divert national resources away from development. Today, India's complex security environment is shaped not only by China's hostility, manifest in its territorial claims and transgressions, but also by its trade stronghold, China's military modernisation, nuclear expansion, and growing naval presence in the Indian Ocean, coupled with its anti-India nexus with Pakistan, heightening India's threat perceptions. Operation Sindoor marked India's hardened stance against cross-border terrorism, emanating from Pakistan, and conveyed a message of "no tolerance for nuclear blackmail". But only time will tell how this signalling has been perceived and interpreted by the Pakistani leadership.

India's immediate neighbourhood is unfortunately plagued by numerous contentious bilateral issues. Despite abjuring any thought of an Indian Monroe Doctrine, New Delhi is still perceived as a regional Big Brother or even a big bully, a crucial factor for Indian diplomats to reflect upon. Internally, India faces a complex web of security challenges. Cross-border terrorism in J&K, sporadic insurgencies in the North East, Left-wing extremism in central and eastern India, and sustained ethnic strife in Manipur continue to pose significant threats to domestic harmony.

Although India seeks to play a leading role in the international order, it has not invested sufficient intellectual capital in assessing and mitigating potential threats. After 78 years of Independence, the nation still lacks a clearly defined statement of its national aims, objectives and security doctrines. This strategic void has seen India repeatedly caught by surprise, often leading to knee-jerk responses to crises. Given India's volatile security landscape and the imperative for

sustained economic growth, there is an urgent need to envision the nation's long-term future and chart a deliberate course to steer.

Naysayers in India insist that since our decision-makers know what is to be done, a formal national security strategy is unnecessary. Other nations, however, have shown greater clarity of vision, and in the Indo-Pacific region alone, the past five years have seen 14 countries issuing national security strategies, policies, or defence white papers (DWP). Amongst them is China, which released its 12th successive DWP, in May 2023, dwelling on geopolitical objectives, external and internal security issues, force structures, and defence modernisation.

It is, therefore, time for India to craft a long-term national security document that integrates strategic vision with economic policy. Once a vision of India's place in the world order, and its intended role as a regional/global power are clearly spelt out, it will illuminate the path ahead for many who, so far, have been groping in the dark.

Such a document will provide clear signposts for India's diplomatic, intelligence, military, and economic institutions to craft policies and strategies that could shape the world we need whole-of-government approach.

In the military sphere, it will serve to sharpen focus on evolution of doctrines, design of force-architecture, acquisition of hardware, and mobilisation of the public and private sectors in defence R&D and production. Without going into minutiae, three major courses of action deserve urgent attention at this stage.

India's primary emphasis should be upon restoring/achieving conventional deterrence, both against our northern and western adversaries, by building up our long-neglected arsenal to sustain intense hostilities for a reasonable duration. Focusing sharply on robotics, beyond visual range aerial and ground attack weaponry, networking of platforms, electronic and cyber warfare, and exploitation of the space segment, we should be ready to incur whatever expenditure is necessary for acquiring these capabilities at the earliest.

In the nuclear domain, while India's 2003 doctrine may have served us well so far, both the Chinese and Pakistani nuclear arsenals have seen growth in number and types of warheads. There have also been subtle but profound doctrinal shifts that call for reflection on India's part to ensure that our nuclear deterrence remains relevant and effective.

Finally, we must consider the unfortunate fact that fate has entrapped India in two of the world's longest-lasting territorial disputes, and if not resolved within a reasonable timeframe, this will hold the country's future to ransom. Given political will and perspicacity, diplomacy can be a powerful tool for conflict avoidance and finding a modus vivendus. A bold leadership would consider taking a leap of faith and looking beyond the current state of historical rancour, political hostility and military confrontation, and engage adversaries in diplomatic dialogue and negotiations.

Arun Prakash is a former chief of naval staff. The views expressed are personal.

CASPAR VELDAMP | FOREIGN AFFAIRS MINISTER, THE NETHERLANDS

They repeatedly incited settler violence against Palestinians, promoted illegal settlement expansion, and called for ethnic cleansing in Gaza

On the Netherlands government banning two Israeli ministers



Why age of consent laws need a nuanced rethink

Across India, there is a growing dissonance between the spirit of child protection laws and a real-world consequence, particularly when the setting of adolescent relationship is considered. The Protection of Children from Sexual Offences (POCSO) Act, enacted in 2012 to shield minors from sexual exploitation, sets the age of consent at 18. While this offers a clear safeguard in theory, it has often become a tool for families to penalise relationships that cross lines of caste, community, or gender norms.

What began as a shield has, in many instances, turned into a sword. Romantic love is reframed as rape. Adolescence becomes another battleground for families to reassert control — often at the cost of the boy's future and the girl's agency.

This legal rigidity ignores the rapidly changing world adolescents inhabit. Teenagers today grow up in a hyper-connected environment — exposed early to sexual content, peer influence, and evolving norms around intimacy. Public displays of affection no longer scandalise the urban middle class.

Smartphones, dating apps, and social media shape adolescents' understanding of love and identity. Yet, our laws pretend that teenage desire does not exist — or worse, that it must be punished.

The real issue lies in POCSO's failure to account for context. It makes no distinction between an exploitative relationship and a consensual one between two teenagers. A 17-year-old in love is treated the same as a 45-year-old predator. The fallout is harsh — boys branded as rapists face shattered futures, and girls lose their voice in decisions about their own bodies.

Many countries have grappled with this complexity more pragmatically. Canada allows consensual sex at 16, or even 14-15 if the partner is within five years of age. Germany permits consensual sex from age 14, provided there's no coercion and the partner is under 21. These "close-in-age" exemptions protect against abuse while recognising adolescent sexuality as a part of growing up.

Our laws are less about protecting children and more about preserving family honour. When girls choose partners outside accepted norms, the law becomes punitive. When families arrange early marriages, society looks away. This is the uncomfortable truth the current Supreme Court debate is beginning to confront. While the Centre defends the 18-year threshold, the Court has raised crucial questions: Should teenagers be jailed for exploring love? Could comprehensive sex education be a better response than prosecution?

The answer lies not in lowering the age of consent indiscriminately, but in crafting a more nuanced legal framework. One that protects without criminalising, and recognises that teenage sexuality cannot be erased through denial or fear.

Such a framework could include close-in-age exemptions for consensual relationships between 16-18-year-olds, judicial discretion to assess the nature and context of each case, mandatory sex education to empower young people with knowledge about consent, boundaries, and safety, unambiguous criminalisation of child marriage, with no exceptions for marital sex.

Ultimately, this is not just a legal issue — it's a cultural reckoning. It forces us to confront our discomfort with adolescent agency, our refusal to talk openly about sex, and our tendency to confuse control with care.

Laws alone cannot protect young people. True protection lies in equipping them to make informed choices. A just society does not fear its youth — it listens to them.

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EXPLAINED HEALTH

EXPOSURE OVER LONG TERM TO AIR POLLUTION INCREASES DEMENTIA RISK, SAYS A LARGE NEW STUDY

LONG-TERM exposure to air pollution is linked to an increased risk of developing dementia, a new large-scale study by Cambridge University researchers has found. The report, published in *The Lancet Planetary Health* last week, is the most comprehensive assessment of its kind, involving a systematic review of 51 studies and drawing on data from more than 29 million participants who had been exposed to air pollutants for at least one year.

The findings
The study, the most comprehensive of its kind, found a positive and statistically-significant association between three common air pollutants and dementia.

PM2.5: Predominantly produced by vehicle emissions and thermal power plants, PM2.5 is extremely fine particulate matter with a diameter of 2.5 micrometres or less. The study found that for every 10 micrograms per cubic metre (µg/m³) of long-term exposure to PM2.5, an individual's relative risk of dementia would increase by 17% from the baseline.

NO2: Nitrogen dioxide is produced primarily due to the burning of fossil fuels by vehicles, thermal power plants, and various industrial processes. The study found that for every 10 µg/m³ of long-term exposure to nitrogen dioxide, the relative risk of dementia increased by 3%. The average NO2 levels at the ITO station over the last 24 hours (as of Tuesday, 8 pm) was 72.

SOOT: Soot or black carbon PM2.5 comes from sources such as vehicle exhaust emissions and burning wood. The study reported that dementia risk jumped by 13% for each 1 µg/m³ of long-term soot exposure. The Central Pollution Control Board does not separately report BC/PM2.5 levels.

The explanation
Over the years, scientists have proposed several mechanisms to explain how air pollution may cause dementia. These primarily involve inflammation in the brain and oxidative stress (caused by



Delhi covered in a thick blanket of smog in 2023. *Proven Khanna*

an imbalance between the production of reactive oxygen species and the body's ability to detoxify them, leading to cellular damage).
Both oxidative stress and inflammation play a role in the onset and progression of dementia, and air pollution is thought to trigger these processes through direct entry of pollutants into the brain or via the mechanisms that underlie lung and cardiovascular diseases.

Why this matters

Dementia is a term for several diseases that affect memory, thinking, and the ability to perform daily activities. The illness gets worse over time, and mainly affects older people. According to WHO, some 57 million people had dementia worldwide in 2021, with the number expected to increase to at least 150 million by 2050.
The rise in air pollution, especially in developing countries, might lead to an even sharper rise in cases. WHO data show that 95% of the global population breathes air that exceeds WHO guideline limits and contains high levels of pollutants, with low- and middle-income countries suffering from the highest exposures.

"These findings underscore the need for an interdisciplinary approach to dementia prevention. Preventing dementia is not just the responsibility of healthcare; this study strengthens the case that urban planning, transport policy, and environmental regulation all have a significant role to play," said Dr Christiaan Breddell from the University of Cambridge, and the study's first author. **ENS**

NEW ATLAS MAPS BIODIVERSITY HOTSPOTS HIDING UNDERGROUND

THE WORLD'S biological riches are not evenly distributed. Instead, much of Earth's plant and animal life is concentrated in a small number of biodiversity hotspots — from the tropical rainforests of the Amazon to the meadows of the Himalayas — that have earned enormous scientific and conservation attention.

Now, a new research suggests that more of these critical hotspots could be hiding beneath our feet — undocumented and largely unprotected. Last week, a team of scientists unveiled a global underground atlas, mapping the biodiversity of organisms known as mycorrhizal fungi. The fungi, which live in and on plant roots, form vast underground networks and perform critical ecosystem services, transporting nutrients to plants, storing carbon, bolstering soil health and helping crops survive environmental shocks and stresses.

More than 80% of the world's plants form symbiotic relationships with mycorrhizal fungi, which entwine themselves in the plants' roots and spread thin filaments underground. Using machine learning models, the scientists predicted that rich reservoirs of these fungi lie hidden in some unexpected places, including the Alaskan tundra and Mediterranean woodlands.

Scientists pulled together more than 2.8 billion fungal DNA sequences from 25,000 soil samples collected in 130 countries and built machine-learning models to analyse this data. The models then made predictions about fungal biodiversity, estimating both richness — how many species were present at a given location — and rarity, or how unique those fungi were. More work is needed to confirm their predictions, which were published in *Nature*.

Some of the findings mirror other well-documented biodiversity trends. For instance, the map predicts that the biodiversity of one major subgroup of mycorrhizal fungi — associated with grasses, crops and many species of trees — is greatest near the equator, a pattern that holds for many plants and animals.

"Our goal was to monitor which grassland bird species live in Kaziranga. Most of these bird species have become rare. They are small, well-camouflaged birds that are not easily spotted, unlike wetland birds. Also, they live in peculiar habitats that are rapidly declining," Bora said.
The survey prioritised 10 species that are either globally threatened or are endemic to the Brahmaputra floodplains: The Bengal florican, swamp francolin, Finn's weaver, swamp grass babbler, Jerdon's babbler, slender-billed babbler, black-breasted parrotbill, marsh babbler, bristled grassbird, and Indian Grassbird. In all, the survey recorded 43 grassland bird species, including one critically endangered, two endangered, and six vulnerable species on the

EXPLAINED ENVIRONMENT

The census exercise

A team of forest officials, scientists, and conservationists carried out a survey between March 18 and May 25 to record the grassland bird population in Kaziranga National Park. The idea emerged after doctoral student Chiranjibi Bora, who is studying the black-breasted parrotbill, a threatened grassland bird, received the INSPIRE fellowship from the central government's Department of Science & Technology, along with acoustic

AMITABH SINHA & ANJALI MARAR
NEW DELHI, BENGALURU, JULY 29

COUNTRIES routinely deploy Earth observation satellites in space for various purposes. But the satellite that the Indian Space Research Organisation (ISRO) will launch on Wednesday is anything but routine.

NISAR (NASA-ISRO Synthetic Aperture Radar), built jointly by ISRO and the US National Aeronautics and Space Administration, has been in development for more than a decade.

At more than \$1 billion, NISAR is the most expensive satellite ever built. It is also the first satellite equipped with two synthetic aperture radars (SARs), operating in different frequency bands, which will make it the most powerful Earth observation satellite ever, producing data and high-resolution images that will facilitate research in a range of fields.

What are SARs?

Radars, large dish-shaped antennas, send out signals in the non-visible spectrum of electromagnetic waves, typically microwaves or radio waves, and collect the signals that bounce back from objects.

The returning signals are analysed to obtain information such as the distance of the object from the radar, its velocity (if it is moving), composition, and texture. Larger antennas are usually able to collect more information.

A SAR is a special kind of imaging radar that is deployed in space where large dish-like radars cannot be sent. SARs use sophisticated technologies and algorithms to mimic the power and resolution of large ground-based radars.

NISAR's antenna, which is 12 metres in diameter, can produce images whose resolution would be comparable to those generated by a simple ground-based antenna of 20-km diameter, according to NASA.

A number of SAR-mounted satellites are currently deployed in space, but none of them have two SARs. ISRO's RISAT (Radar Imaging Satellites) series of satellites — now renamed to the EOS series — carry a SAR. Some of ISRO's other Earth observation satellites such as Cartosat and Oceansat do not use SARs.

What is the benefit of using SARs that operate in different frequency bands?

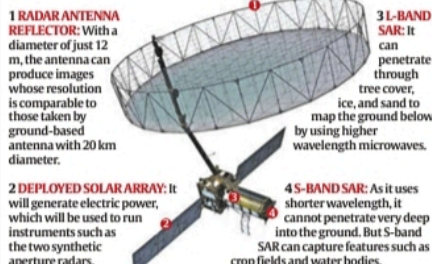
One of NISAR's SARs operates in L-band frequency, the other in the S-band. They are designed to capture complementary sets of images for the same location at the same time,

NISAR's two eyes on Earth

NISAR, launching today, has been jointly built by ISRO and NASA. It will be the most powerful of all Earth observation satellites, its two synthetic aperture radars operating in tandem in different frequency bands



NISAR at Satish Dhawan Space Centre in Sriharikota on July 18. AP



providing a detailed view of the Earth.

Both the L-band and S-band radars can see through clouds, smoke, rain, and fog for an unfiltered view of the planet across all weathers, and through day and night.

The different wavelengths of the radars will enable them to capture different kinds of details on the surface. The L-band SAR, which uses higher wavelength microwaves, can better penetrate tree cover or vegetation, sand, and ice. It will capture minute details of surface undulations, and see through dense forest cover, for example, to map the ground below and measure tree trunk biomass, which is useful for estimating carbon stock.

The S-band SAR, which has a shorter wavelength, cannot go very deep, but is good for capturing larger features such as crop fields and water bodies. It can observe crops like soybean, corn, and sugarcane, and provide information on their growth and maturity stages.

As the L-band and S-band SARs will work together, they will give a comprehensive picture of the observed area — generating imagery of the kind that is not possible by integrating data from S-band and L-band SARs on two separate satellites. These satellites would not be able to look at the same place at the

same time, and any changes that occur between their observations would be missed.

Putting two SARs on the same satellite was a major engineering challenge, which was the main reason for the extended time that was needed to get NISAR ready. Each of the two radars requires its specific hardware, and integrating their signal processing capabilities without one of them interfering with the other needed sophisticated engineering.

What is the significance of ISRO partnering with NASA on NISAR?

Developing and installing SARs on NISAR involved significant costs. That is why a collaboration between two space agencies made sense.

The L-band SAR, the 12-metre antenna, and many other components and systems, including GPS control, have come from NASA. ISRO has contributed the S-band SAR, the rocket, the spacecraft and its sub-systems, and will carry out the launch.

The two agencies will handle mission operations from their respective ground stations. NASA has invested \$1.16 billion in the mission; ISRO has given \$90 million.

The idea for a NISAR-like mission emerged in 2007 after a committee in the US recommended a space mission to study changes in land, ice, or vegetation cover. The mission aimed to carry out surface deformation monitoring to facilitate studies of earthquakes, landslides and volcanoes, and make observations that would help studies of climate change, the global carbon cycle, and changes in vegetation, biomass, and ice cover.

NASA began working on the project in 2008. ISRO came into the picture four years later, when it identified science studies and applications that were complementary to the primary objective of the mission. NASA and ISRO had collaborated earlier — there was a NASA payload on Chandrayaan-1 — but they had not jointly developed or executed a space mission. The NISAR deal was signed in 2014.

The launch comes at a time when the two countries have stepped into a more strategic partnership on space. India has signed on to the Artemis Accord, a US-led partnership on space exploration that is closely linked to NASA's Artemis program to return humans to the Moon. NASA and ISRO have also worked out a strategic framework for human spaceflight cooperation. One of the first outcomes was the participation of Shubhanshu Shukla in the NASA-facilitated Axiom-4 private mission to the International Space Station.

Where and how flash floods are impacting India

ALIND CHAUHAN
NEW DELHI, JULY 29

A YEAR ago, landslides following torrential rain and flash floods killed 373 people in Wayanad, Kerala. A month before that, five Arunachal Pradesh were killed after a flash flood in the Shyok river in Ladakh swept away a tank. In 2023, dozens died after a Glacial Lake Outburst Flood (GLOF) in Sikkim. This month, flash floods and landslides killed more than 100 people in Himachal Pradesh.

Flash floods after extreme rainfall events kill more than 5,000 in India annually, and cause significant damage to infrastructure, farmlands, and the environment. As the global climate crisis intensifies, these events are becoming more frequent — increasing from 132 in 2020 to 184 in 2022, official figures show.

What factors are driving flash floods and where, and how can their impacts be limited? A study by researchers at IIT Gandhinagar has provided some important insights. ("Drivers of flash floods in the Indian sub-continent river basins", *Nature*, July 13)

Most vulnerable

Flash floods occur most frequently in the Himalayas, Central India, and the west coast of the country, the study has reported.

The researchers analysed sub-basin (parts of large river basins) to identify flash-flood hotspots, and identified sub-basins in the Brahmaputra, Narmada, Tapi, Mahanadi, Brahmani, and west coast river basins as being "extremely prone" to flash flooding.

Parts of the Godavari, Ganga, Mahi, and Indus river basins have been identified as "highly susceptible".

There has been a notable increase in flash flood events since 1995. Most have occurred in the Brahmaputra river basin, followed by the Ganga and Krishna basins, the study says.

Driving factors

Only 25% of flash floods are directly caused by extreme precipitation, the study says. The rest are due to a combination of extreme rainfall and the condition of the soil before precipitation.

"If the ground is already wet before a heavy rainfall event, chances are the soil would be saturated or near saturated, which can lead to instant runoff. This increases the risk of flash floods," study co-author Vishal Mishra said.

In only 23% cases does an extreme rainfall event lead to immediate (within six hours) flash floods; prolonged (multi-day) rain, of both low and high intensity, is usually the reason, the study says.

On the west coast and in Central India, flash floods are driven by the high 'flashiness' of sub-basins — where water levels rapidly reach a peak after a heavy rainfall event. Soil conditions play a crucial role in determining how quickly water infiltrates a sub-basin.

In the Himalayas, factors such as steep slopes and high relief (when there is a significant difference between a high point and low point) add to chances of flash floods.

Climate change

For every degree Celsius increase in average temperature, the atmosphere can hold about 7% more moisture, leading to more intense precipitation.

Between 1981 and 2020, the yearly frequency of extreme precipitation events dou-

bled during the pre-monsoon season in India. Extreme rainfall during the monsoon, post-monsoon, and winter seasons has increased by 56%, 40%, and 12.5% respectively, the study notes. More than 75% of all flash flood events in the period 1980 to 2018 occurred during the June-September monsoon season.

Rising temperatures are also leading to more wet hours in most sub-basins that are not currently flash flood-prone, says the study.

Adaptation strategies

Findings of the study point to the need to adopt region-specific adaptation strategies that are based on factors such as topography and soil conditions, and not just extreme rainfall events.

This can help in developing better early warning systems, targeted disaster preparedness, and long-term adaptation plans, the researchers say.

There is also a need to identify new potential flash flood hotspots and build climate-resilient infrastructure to limit the impacts.

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Listening to birds, counting them too: Kaziranga census that PM mentioned

SUKRITA BARUAH
GUWAHATI, JULY 28

IN HIS *Mann ki Baat* radio program on Sunday, Prime Minister Narendra Modi spoke about the "first-ever grassland bird census" in Assam's Kaziranga National Park, and the technology used for the exercise.

What is the bird census, and what was its methodology?

monitoring tools to conduct his research. Bora, along with Kaziranga authorities, decided to use the tools to count all grassland bird species in the park, 70% of which is covered by grassland.
"Our goal was to monitor which grassland bird species live in Kaziranga. Most of these bird species have become rare. They are small, well-camouflaged birds that are not easily spotted, unlike wetland birds. Also, they live in peculiar habitats that are rapidly declining," Bora said.
The survey prioritised 10 species that are either globally threatened or are endemic to the Brahmaputra floodplains: The Bengal florican, swamp francolin, Finn's weaver, swamp grass babbler, Jerdon's babbler, slender-billed babbler, black-breasted parrotbill, marsh babbler, bristled grassbird, and Indian Grassbird. In all, the survey recorded 43 grassland bird species, including one critically endangered, two endangered, and six vulnerable species on the



(From left) Ashy prinia, Finn's weaver, and striated babbler. *Kaziranga National Park*

IUCN Red List.

The unique methodology

The use of passive acoustic recording monitoring was the highlight of the survey, Kaziranga National Park Director Sonali Ghosh said. "Surveying these small, shy, and

highly camouflaged birds is very difficult using traditional methods like visual counting. So, the acoustic recorders were placed in tall trees near grasslands during the breeding season of the birds, between March and May. This is the season when they are very vocal, calling out for mates, and with males defend-

ing territory. The instruments recorded all the birds singing in the landscape," Dr Ghosh said.

Bora said various tools were then used to identify the birds from the recordings.

"After recording for three consecutive days, we removed the recorders and analysed those sound files. If the sound was not identifiable, we used software to create a spectrogram, which is a graphical representation of the sound, to aid us in identifying. We also used a tool called Birdnet, which uses machine learning to try and identify species by bird song. We covered 29 locations in the park using six recorders," he said.

Significance of findings

Dr Ghosh said grassland birds are "an indicator of good health" of an ecosystem, rather like body mass index (BMI) for humans. "The presence of these birds tells us that the habitat is healthy," she said.

The park authorities are particularly excited by the discovery of a breeding colony of the endangered Finn's weaver, which is endemic to the Brahmaputra flood plain.

"They nest on tree tops, but till now, we did not know where they were nesting. During the survey we found a colony of more than 85 nests," Dr Ghosh said.

Threats to the birds

Over the past four decades, Assam has lost around 70% of its grasslands, Bora said.

"There are anthropogenic factors such as overgrazing and clearing of grasslands for cultivation. But there is also a natural phenomenon called ecological succession, which is basically an instinct for grasslands to gradually transition to forests. Among the 10 species that we had prioritised, three are endemic to the grasslands of the Northeast, which means that if they vanish from here, they become extinct," he said.

Climate change is a major concern, Dr Ghosh said. "It is a cause of worry. We used to see a lot more of some species like the Bengal florican, but this time we could detect only one or two. Further study can tell us if the decline is influenced by climate change or other factors," she said.

THE IDEAS PAGE

West vs Rest, a fiction

Many are keen to proclaim the decline of the Western global order. But its legacies of reason, scepticism, individual liberty and secularism continue to be powerful magnets all over the world



RAJA-MANDALA
BY C RAJA MOHAN

SPEAKING AT THE 1957 Moscow Conference of Communist and Workers Parties, Chinese communist leader Mao Zedong declared that the "East wind will prevail over the West". The occasion was the 40th anniversary of the 1917 Bolshevik Revolution. For Mao, the "East wind" meant the "socialist camp" (led by the Soviet Union and China), and the "West wind" represented the capitalist countries (led by the US). He declared that the balance of world forces had shifted decisively in favour of the socialist camp in the middle of the 20th century.

The idea that the West is in decline and that it will soon be swamped by the rising tide of "the rest" has been a recurrent theme since the encounter between the West and the rest began several centuries ago. Here is the problem. The West refuses to disappear, and the rest is having a difficult time taking charge.

Mao himself embarked on a fight with the Soviet Union barely two years after making the grand declaration on the rise of the East wind. He broke the socialist camp, divided the communist movement all over the world, and paved the way for an alliance between Communist China and the "evil empire", the US. The marriage between Western capital and the Chinese market produced a breathtaking global economic expansion for nearly five decades. It also built Beijing the second most important power — economic, technological and military — in the world.

A risen China now talks again of leading the East, now rebranded as the "Global South" or the "Global Majority" to victory against a declining West. Declinism is also in fashion in Western academia and think tanks. Many fear the barbarians from the East are ready to show up at the gates. The fear in the West is matched by the irrational exuberance in the rest about the impending collapse of the US-led world order.

Sceptics might say, not so fast. They point to US President Donald Trump's entirely unanticipated initial successes in single-handedly rewriting the rules of global trade. The rest did not join hands to counter Trump. Most of them have opted up to negotiate bilateral trade agreements with him. The claim that Trump is winning is vigorously contested. Is Trump accelerating the decline of the American empire and the West, or is he heralding its resurgence? While the debate on this question will continue, Amitav Acharya, one of the leading scholars of international relations, puts the debate in a deep historical perspective.

Acharya's new book, *The Once and Future World Order*, seeks to dismantle the conceptions of global order built around the rise of the West. He reminds us that there was a world before the West and another after it. Acharya argues that the pursuit of order — rules, norms, and institutions that enable peace and promote commerce — did not begin with the modern West. He suggests it is rooted in ancient, diverse civilisations



C R Sasikumar

across the world. Far from a future dominated by a new hegemon or descending into chaos, he foresees a decentralised, inclusive system drawing on both Western and non-Western traditions.

Acharya asserts that ancient Sumer, China, India, Greece, Mesoamerica, and the Islamic world all devised ways to manage interstate relations. While the post-World War II Liberal International Order led by the US shaped the modern age, Acharya sees it as just one chapter in a longer global history. The Western-led order, forged through empire, conquest, exploitation and ruthless Cold War geopolitics, was never as universal or complete as its proponents claimed. Global norms evolved through continuous cross-civilisational borrowing. The West never monopolised the ideals of peace, law, or cooperation.

In confronting anxieties about Western decline, Acharya offers a different narrative. Rather than a harbinger of disorder, the erosion of Western primacy creates space for a more equitable global structure. He introduces the concept of a "multiplex" order — where no single state dominates, and multiple actors, from states to international institutions and non-state players, share responsibility for shaping norms.

Rejecting both the "clash of civilisations" and the idea of an inevitable Chinese hegemony, Acharya advocates a cooperative system grounded in civilisational pluralism. He envisions a world not of imposed norms but of negotiated consensus — a "confluence of civilisations". This future demands learning from each other, not dominance. The *Once and Future World Order* is a timely corrective to the dominant narratives in the West and the East. Acharya's central message is that the rise of non-Western actors is not a crisis but a chance to build a fairer, more representative system.

Acharya's hopeful vision of a multiplex order is persuasive but incomplete. It downplays serious constraints in the East that hinder its capacity to shape a just and effective global order. These include authoritarianism, the rise of a state that is free to curtail individual freedoms in the name of claimed collec-

There is no question that China has been the most successful non-Western world state in bringing economic prosperity and in rooting out the feudal vestiges. But it is yet to redeem the Chinese national movements' promise to deliver democracy to its people. Externally, China is unable to overcome the temptations of national chauvinism and the urge to dominate its neighbourhood. That, in turn, shatters ideas of Asian unity and the Chinese ability to lead a compact of the rest against the West.

tive interests, violent politics based on exclusive religious, caste, and linguistic identities, and the empowerment of violent vigilante groups that destroy social peace.

There is no question that China has been the most successful non-Western world state in bringing economic prosperity and in rooting out the feudal vestiges. But it is yet to redeem the Chinese national movements' promise to deliver democracy to its people. Externally, China is unable to overcome the temptations of national chauvinism and the urge to dominate its neighbourhood. That, in turn, shatters ideas of Asian unity and the Chinese ability to lead a compact of the rest against the West.

If the Western oppression is real, the Eastern ones are worse. Meanwhile, students, scientists, technologists, entrepreneurs, the rich and political dissidents from the East continue to migrate to the West, if they can. The soft power of the West remains a powerful magnet to those who see themselves as suffocating under the Eastern regimes.

Acharya's critique of Western dominance is compelling, but not all aspects of the Western legacy can or should be discarded. The Enlightenment ideals of the 17th and 18th centuries — reason, scepticism, science, individual liberty, and secularisation of society away from religious dominance — are at the very foundation of Western primacy in the last three centuries.

If the East wishes to lead in shaping the world order, it must engage these ideals critically and constructively. Any notion that the East can rise only short-circuiting these values is an illusion. It is by delays and derails the effort to rise. The battles against political, religious, and other absolutisms remain to be fought and won in the East. Until then, a rising East will not present an alternative model — only a different and less attractive one. The profound internal contradictions within and across the East will continue to keep it well behind the West.

The writer is a distinguished fellow at the Council for Defence and Strategic Research and contributing editor on international affairs for The Indian Express

WHAT THE OTHERS SAY

"The US, which recognises that Syria's disintegration is not in its interests, has sought to rein Israel in and must continue doing so." — THE GUARDIAN

Unprecedented, without justification

Supreme Court decision to stay the precedential effect of Bombay High Court acquittals in train blast case is worrying



RAJU RAMACHANDRAN

LAST WEEK, THE Supreme Court (SC) stayed the precedential effect of a carefully reasoned Bombay High Court (HC) verdict that acquitted 12 persons accused in the 2006 Mumbai train bombings. The stay, without giving substantive reasons, is worrying.

The case arose out of one of the most horrific terror attacks India has seen. On July 11, 2006, a series of seven coordinated bomb blasts ripped through compartments of Mumbai's trains, killing 187 people and injuring over 800. The Anti-Terrorism Squad of the Maharashtra Police took over the investigation, resulting in the arrest of 13 persons. The accused were charged under various sections of the Indian Penal Code, the Maharashtra Control of Organised Crime Act, 1999 (MCOCA), the Unlawful Activities (Prevention) Act, 1967 (UAPA), as well as the Explosive Substances Act, 1908. In 2015, a special court convicted 12 of them, sentencing five to death and the rest to life imprisonment. Its judgment relied heavily on the confessional statements made by some of the accused under Section 18 of MCOCA, declaring them "voluntary and truthful" despite the defence arguing that they were the result of torture and dramatic acts that they were subsequently retracted.

Since the death sentence had been imposed, the case was referred to the Bombay HC for confirmation. The persons sentenced to life imprisonment also filed appeals, and these cases were heard together by a Division Bench. In a 671-page judgment, the HC examined every aspect of the prosecution's case, finding its narrative to be riddled with inconsistencies and lacking in conclusive proof. Among other things, the court found that several key eyewitness testimonies were wholly unreliable, with some witnesses coming forward after more than 100 days of silence. The ability of witnesses to identify the accused in court after more than four years was doubted.

Crucially, the HC declared that the invocation of the stringent MCOCA was improper. When prior approval for invoking that Act was granted, information about the existence of the legal ingredients and conditions was clearly not furnished before the approving authority. Also, the "prior" approval was found to be without application of mind. Another key ingredient for the invocation of MCOCA is that there must be a "continuing unlawful activity", as defined in that Act, and that condition was not fulfilled. The HC also held that the confessions relied on by the prosecution were inadmissible due to evidence of brutal torture, lack of voluntariness, and procedural violations under MCOCA, including defective "prior" approvals and identical statements. It noted medical evidence of injuries, retractions made immediately upon judicial custody, and the absence of critical details like the bombs' chemistry, all of which undermined the credibility of the alleged confessions. The court also noted the failure of police to prove voluntariness through oral evidence and the striking fact

that the accused had remained silent for months in custody. They allegedly confessed only after MCOCA was invoked: A pattern that undermined the genuineness of the statements.

The HC ultimately acquitted all 12 of the accused, concluding that the prosecution "utterly failed to establish the offence beyond a reasonable doubt against the accused on each count". The acquittal alerts us to the disturbing fact that the actual masterminds of the 2006 Mumbai train blasts have remained scot-free for nearly two decades. It is particularly pertinent to pay heed to a preliminary paragraph in the HC's judgment, where it emphasises the dangers of "creating a false appearance of having solved a case by presenting that the accused have been brought to justice". This, the HC rightly notes, "undermines public trust and falsely reassures society, while in reality, the true threat remains at large". The stay order by the SC is jarring for several reasons. The first is the summary manner in which the Court, "taking note of the submissions made by the learned Solicitor General on the question of law", said it was "inclined to hold that the impugned judgment shall not be treated as a precedent in any other pending proceedings". Based on this, the SC ordered "there shall be a stay on the operation of the impugned judgment" to that extent. For the Court to "hold" something, normally, both sides would be heard, and the Court would provide a reason. Instead, the stay order appears to be solely based on the assertion of the Solicitor General. There is no mention of any specific questions of law, or even the presence of a legal issue as a precedent. The SC order does not even refer to the tests it typically applies while determining whether a stay is to be granted. It makes no mention of whether the state has made out a prima facie case, whether the balance of convenience lies on its side, or how irreparable damage might be caused if the HC judgment is not stayed.

Second, the stay order appears to undermine the HC's authority. The HC is not only a constitutional court, but also the mandatory reference court for death sentences, and the first appellate court meant to decide authoritatively on both facts and law. To summarily strip a judgment from such a body of its precedential value is unfair and demoralising.

Third, and perhaps most important, is the signal the order sends out. This must be viewed in a broader context concerning cases involving terror offences, where there are often myriad pressures on the judiciary to secure a conviction to placate public outcry. In these cases, it takes a certain degree of judicial courage and integrity to focus on the particular questions of fact and law that arise in a case without being swayed by general public discourse. The HC's judgment was a bold affirmation of the principle that the judicial task is to dispassionately weigh evidence and uphold the law, however horrifying the crime. The judgment acknowledged the tragedy of the lives lost and harm caused, but refused to sacrifice the lives of innocent persons for the sake of a "false appearance" of closure. Viewed in this broader context, the stay order sends a disconcerting message that even the most thorough and well-reasoned acquittals in these kinds of sensitive cases may be suspended on the basis of assertions by the state.

The writer is a senior advocate, Supreme Court of India

A roadmap for learning

Surveys like PRS 2024 can provide key insights for a stronger education system



JAYANT CHAUDHARY

IN RECENT YEARS, education in India has not only expanded in scale but matured in ambition. Our reforms today are about quality, pedagogy, and learning outcomes. We have made a deliberate shift towards ensuring that every child in the country not only attends school but also truly learns. To understand if that is happening, we must pause and ask the right questions. What are our children learning? Are schools enabling them to build essential skills at each stage of their education? These questions require reliable, scientific answers.

As an expert noted, "Students can learn despite poor teaching, but they cannot overcome poor assessment." This reminder is crucial because the best way to determine the effectiveness of our education system is through large-scale assessments. These analyse macro trends to determine educational effectiveness. They find patterns in data from different locations, subjects, grades, and schools. This form of evaluation helps teachers and policymakers understand the strengths and weaknesses of students. Overall, it helps diagnose systemic issues and buttress policymaking.

Over the past two decades, India has gradually built capacity in this area. Advancing from the National Achievement Surveys (NAS) to PRAAR (Pratyaksha Sarvekshana) (PRS) 2024, the scale of the survey has grown to cover 21.15 lakh students in 74,229 schools across the country. Students from Grades III, VI, IX and X were assessed to correspond with the end of

the foundational, preparatory, and middle stages of schooling. These stages are now well-established under the new curricular structure in line with the National Education Policy (NEP) 2020.

At the foundational stage, the data show that India has not only recovered from the learning losses of the pandemic but, in many cases, surpassed earlier benchmarks. In Grade III, 57 per cent of children demonstrated proficiency or above in Languages, up from 39 per cent in 2021 and 47 per cent in 2017. In Mathematics, the figure has jumped to 65 per cent, compared to 42 per cent in 2021. These gains reflect the serious and sustained efforts made under the NIPUN Bharat Mission, underscoring how targeted support, teacher mentoring, and early-grade interventions are beginning to bear fruit. The data also show that government schools in rural areas have, in some cases, outperformed their urban and private counterparts in foundational grades. This is a significant development, demonstrating what focused, systemic reform can achieve. However, as we move to Grades VI and IX, the picture becomes more complex. Central government schools have performed well overall, but marginal gaps persist by gender and region, particularly in Mathematics and Science. These are areas that need urgent focus.

Many comparisons have been made between PRS 2024 and earlier surveys, which are misplaced and require clarification. The struc-

ture of the assessment has changed. Earlier surveys focused on Grades V and VIII, whereas this edition concentrates on Grades VI and IX, aligning with the new curricular stages. Moreover, the shift from textbook learning outcomes to competencies means the assessment tools are fundamentally different. Directly comparing a Grade V outcome from NAS 2021 with a Grade VI outcome from 2024 is methodologically unsound. Only Grade III scores are comparable across all three surveys, and the improvement in these scores is established. Any interpretation that suggests a decline in performance based on comparisons with other grades risks misrepresenting the actual story.

What we now have is not just a report card, but a roadmap. The actual value of the data from the survey lies in how they are used locally. PRS provides district-level insights, and it is now the responsibility of states, districts, and school systems to translate these findings into granular, need-based interventions. Every state and UT will need to study its data — where learning levels are strong, where gaps persist, which support systems are working and which are not. The Centre will continue to provide guidance, frameworks, and resources; however, the real impact will come from what is done at the school and district levels. Our goal is not just to meet national benchmarks, but to achieve international comparability, and we are steadily moving in that direction.

The importance of assessments, however, does not end with school education. We must also focus on how young people transition into the world of work, entrepreneurship, and economic participation. Skills matter as much as academics. That is why, soon, the government will initiate a qualitative, large-scale skills assessment that will help us understand the skill-readiness of our population, map regional variations, and plan targeted interventions in vocational education and skilling. The recent adoption of a data-driven IT grading system and inclusion of NEET (Not in Education, Employment or Training) in the PLFS exercise is also aimed at providing key inputs for our reform process.

The ambition is to link learning to livelihood, ensuring that every young Indian is not only educated but also employable, entrepreneurial, and equipped to contribute meaningfully to the country's development.

PRS 2024 is a powerful reflection of how far we have come. But it is also a signal of what lies ahead. As we build stronger foundations in school education and expand the horizon of skill development, we remain committed to a system that is inclusive, evidence-driven, and future ready.

The writer is Union Minister of State (Independent Charge) for Skill Development and Entrepreneurship, and Minister of State for Education, Government of India

LETTERS TO THE EDITOR

TEST IS BEST

THIS REFERS TO THE editorial, "A beautiful draw" (IE, July 29). It goes without saying that both Ravindra Jadeja and Washington Sunder so patiently yet bravely standing like a rock against the fiery English bowling attack in Manchester, could not be child's play. For sure, England and their captain, Ben Stokes, would have never dreamt of such a dramatic end to this match, which could be akin to a victory for Team India. However, there is no room for any complacency on the part of the Indian team either, with one more Test match to go. **SK Gupta, via email**

A MAN OF PRINCIPLE

THIS REFERS TO the article, "Gentle crusader" (IE, July 29). Sumit Chakravarty was a doyen of journalism who was highly respected by his contemporaries and society at large for his steadfast dedication to the profession. He stepped into journalism not to make contacts with those in power but to be the voice of the disadvantaged. He stood up for freedom of the press to the establishment, whatever the consequences. His refusal to accept the much-coveted Padma Bhushan speaks volumes about his being a man of high principles. **SH Quadri, Bilanjer**

THIS REFERS TO THE editorial, "A beautiful draw" (IE, July 29). The glowing tribute paid to the grit of Indian cricket by this editorial is a memorable one. Even considering the various lows and highs of these five days, an interesting highlight was the tenacity of the players against all provocations and traps. This game will be remembered for a long time by cricket fans all over the world and the heroic efforts of all involved will inspire the budding talent scattered in bylines of our town and villages. **Sanjeev Raina, Greater Noida**

MANSA STAMPEDE

THIS REFERS TO the report, "8 killed, 30 injured in stampede near Mansa..." (IE, July 28). It has become the order of the day that whenever people assemble in numbers to visit temples or religious places of importance, or attend victory celebrations of sports, elections etc, stampedes occur, resulting in the death of hundreds of devotees, fans and admirers. We have not learnt any lesson from previous stampedes. **Tharicus S Fernando, Chennai**

THE EDITORIAL PAGE

WORDLY WISE
IT HAS BECOME APPALLINGLY OBVIOUS THAT OUR TECHNOLOGY HAS EXCEEDED OUR HUMANITY.
—ALBERT EINSTEIN

The Indian EXPRESS

FOUNDED BY
RAMNATH GOENKA
BECAUSE THE TRUTH INVOLVES US ALL

Trade in time of disorder



JAWED ASHRAF

UK-India FTA is a template for other agreements. It serves Delhi's economic and geopolitical objectives

CRACKS IN IT

TCS layoffs speak of challenges for the sector in times when AI and automation play an increasingly greater role

ON SUNDAY, INDIAN tech giant TCS announced its decision to lay off 2 per cent of its global workforce — around 12,000 jobs — over the year. Following this announcement, on Monday, TCS shares fell around 1.6 per cent during trading. Shares of other IT companies mirrored the decline. While the layoffs are being framed in terms of moving towards a "future-ready organisation" through "skilling and redeployment", concerns over changes in the operating environment of tech companies are being raised. While the TCS decision is expected to hit mid- and senior-level employees the most, the question is whether the layoffs are the beginning of a larger churn in the Indian IT sector.

The IT sector in India has been a major source of employment, especially so in recent years. As per a report in this paper, in the big five IT companies — TCS, Infosys, Wipro, HCL Technologies and Tech Mahindra — employment went up from 11.5 lakh in March 2020 to 15.34 lakh by December 2024 as demand for IT services and digitalisation surged post the pandemic. To put these employment figures in perspective, the Indian Railways employed more than 12.5 lakh regular employees as of 2023-24. But, these years have also witnessed two other developments — the advent of AI and Donald Trump's second term — which are reshaping the operating environment in unprecedented ways. The rapid adoption of AI and automation across the world has dramatically altered the business milieu. And not just in the IT sector, which has been affected, but others as well. Alongside, the economic uncertainty unleashed due to Trump's policies has impacted firms' investment and spending decisions. These have raised questions over the future of the Indian IT sector.

Cracks are already appearing in the sector's business model — a model that has relied on the country's educational institutions to churn out software engineers at scale and on wage arbitrage. The question is, if over the coming years, AI and automation make large swathes of IT jobs redundant, and the wage arbitrage with other economies reduces, then, where does India's competitive advantage lie? Considering that Indian IT firms do not allocate large sums of money for research and development — for instance, the consolidated R&D and innovation expenditure for TCS was Rs 2,630 crore in 2024-25 (around 1 per cent of its turnover), and the standalone R&D spending of Infosys was Rs 850 crore in 2025 (0.62 per cent of its revenue) — will firms be able to move up the value chain? And with companies drawing up plans for a future where AI and automation play an increasingly large role, will the business model of IT companies change, and what will be the impact of these changes on the labour market in India? The IT sector will need to navigate these turbulent times carefully.

THE FORMAL SIGNING of the India-UK Comprehensive Economic and Trade Agreement (CETA) headlined Prime Minister Narendra Modi's visit to the UK. Since leaving the EU, "Global Britain" has been on a spree to conclude or join FTAs. After a period of FTA pause, India, too, is on an accelerated pursuit of trade agreements. Though neither is the other's major trading partner, the salience of CETA lies in the symbolism and substance, the future potential, the many tangible and intangible dimensions of this partnership, and the infusion of strength into a relationship that faces challenges not from customary colonial memories, but from contemporary challenges to India's security and integrity.

CETA's significance also derives from its ambition, FTAs either cover areas that fall within the mandate of the WTO or go deeper in covering commitments and harmonisation on a range of national economic policy issues to facilitate stronger economic partnership among signatories. CETA embodies the latter. The two governments have hailed CETA as a landmark agreement because of the balance of openings and protections, coverage and scope and also because, from India's standpoint, it is the first comprehensive one with a major Western partner that defines the template for others, including with the EU.

CETA is historic for another reason. It is an important milestone in India's — as in the world's — growing reliance on bilateralism and regionalism at a time when the multilateral trade regime is eroding as its architect, which is still the world's most powerful economy, turns its back on it. President Donald Trump has abandoned the foundational principle of the global trade regime. As in other domains, the US no longer finds the system it created useful or attractive. Trump has accelerated a longer-term trend in the US since the Global Financial Crisis (GFC) of 2008 towards trade hesitancy, if not hostility, and protectionism, through the successive tenures of presidents Barack Obama, Trump and Joe Biden. There is a bipartisan consensus that the US will not surrender its sovereignty to the binding rule-making role of the WTO. The current sentiments will continue to shape the US political economy.

For the US and the West broadly, the problem has deeper structural roots in the consequences of the recent wave of globalisation that began in the 1970s and peaked by the time of the GFC. The first wave of globalisation from 1870 to 1914 led to the concentration of prosperity and power in the industrialising West and America's rise as a major power. By contrast, the recent phase triggered Asia's rise, China's emergence as a major power and the West's relative decline with disruptive political consequences in the advanced countries. In particular, it has resulted in China's extraordinary accumulation of industrial and technological power and dominance in key industries and supply chains in a fundamentally different political and economic system, incongruous with a transparent trade regime. The concentration risk was laid bare by the Covid pandemic. Further, the sharpening geopolitical competition has manifested in trade and technology. The war in Ukraine deepened shifts and uncertainty. Together, these factors have put globalism and its scaffolding under extreme stress.

India signed a spate of agreements during the UPA era, mostly in Asia. However, not all of them were with competitors like ASEAN, but also with complementary economies like Japan and Korea. That these agreements had disappointing outcomes was as much due to their terms as to our lack of competitiveness. Their lessons are shaping the choice of partners and the terms of the agreements, and alignment with domestic policies and incentives. Nonetheless, global trends point to an enhanced need for comprehensive FTAs.

For the US and the West broadly, the problem has deeper structural roots in the consequences of the recent wave of globalisation that began in the 1970s and peaked by the time of the GFC. The first wave of globalisation from 1870 to 1914 led to the concentration of prosperity and power in the industrialising West and America's rise as a major power. By contrast, the recent phase triggered Asia's rise, China's emergence as a major power and the West's relative decline with disruptive political consequences in the advanced countries. In particular, it has resulted in China's extraordinary accumulation of industrial and technological power and dominance in key industries and supply chains in a fundamentally different political and economic system, incongruous with a transparent trade regime. The concentration risk was laid bare by the Covid pandemic. Further, the sharpening geopolitical competition has manifested in trade and technology. The war in Ukraine deepened shifts and uncertainty. Together, these factors have put globalism and its scaffolding under extreme stress.

Calls for reshoring and industrial sovereignty face limitations of lost capabilities, and deeply entrenched Global Value Chains (GVCs) that various estimates put at 50-70 per cent of global trade. Trade remains essential for all nations. But as nations seek to derisk, diversify and rebalance trade relations in a world in flux, they seek long-term commitment, trust, assurance and resilience through bilateral and regional agreements. The number of such agreements, although within the WTO framework, has risen rapidly in the past two decades, with an increase in momentum after the GFC and the Covid pandemic.

Trump's strategy will accelerate the trend. For one, despite his impetuosity, the legislative uncertainty of his authority and questionable enforceability of the "deals", countries are seeking exclusive and competitive bilateral agreements with the US. At the same time, hedging strategies, against both US unpredictability and China's dominance, will trigger new bilateral or regional agreements, as well as expansion, restructuring and interlocking of existing regional agreements: The Trans

Pacific Partnership was resuscitated as the Comprehensive and Progressive Trans Pacific Partnership (CPTPP) after the US's exit.

India's preferred path is more manageable bilateral agreements with countries or groupings rather than participation in regional agreements. India signed a spate of agreements during the UPA era, mostly in Asia. However, not all of them were with competitors like ASEAN, but also with complementary economies like Japan and Korea. That these agreements had disappointing outcomes was as much due to their terms as to our lack of competitiveness. Their lessons are shaping the choice of partners and the terms of the agreements, and alignment with domestic policies and incentives.

Nonetheless, global trends point to an enhanced need for comprehensive FTAs. With the atrophy of the predictable, non-discriminatory global trade regime, FTAs will become determinants of competitiveness. These have become essential for creating opportunities for our services sector and mobility of our professionals, and for access to critical minerals, technology, innovation and energy.

Above all, there is a strong correlation between high-quality FTAs and the GVCs. Assured integration into GVCs will serve our twin objectives of rapid industrialisation and export growth at scale. It is even more critical now as various studies estimate the share of potential bottleneck products in global trade to have doubled since 2000 to around 20 per cent, with almost 66 per cent of the share of the global export value in these products now coming from East Asia-Pacific. This also means that, besides the new FTA with Australia, we must revisit the CEPA/CECA with Japan, Korea and Singapore, not just to improve their terms but also for assured access to critical inputs to fully exploit the potential of FTAs with Western partners. This will also require finding a *modus vivendi* with China.

As India pursues its national transformation at a time of global disorder, shaping our external economic engagement strategically is both a geopolitical necessity and an economic imperative.

The writer is a retired ambassador

BOARD OF HER OWN

Divya Deshmukh's victory in FIDE Women's World Cup showcases the depth of women's chess in India

INDIAN CHESS HAD a breakthrough moment on Monday when Divya Deshmukh defeated veteran compatriot Koneru Humpy in the final of the FIDE Women's World Cup in Batumi, Georgia. At 38, Humpy is twice Deshmukh's age, which made the final a true clash of generations: Humpy, the original trailblazer of women's chess in India, became the country's first woman to claim the grandmaster title, while Deshmukh is the fastest to reach that rank and become a grandmaster. Her meteoric rise can be gauged from the fact that just last year, she had become the World Junior Champion in the girls' category. Thirteen months later, she's fighting for — and winning — the biggest titles on offer in the senior category.

The spectacle of two Indian women fighting it out in the final of the World Cup, an event where 107 players from 46 nations competed, is special. But what makes the win even more significant is the fact that while two Indians were in the final, two Chinese players — former women's world champion Tan Zhongyi and Lei Tingjie — were fighting for third place after losing to the two Indians. China is a powerhouse of the women's event, having given the world six out of the 17 women's world champions in history. This includes the current women's world champion, Ju Wenjun, and the current World No 1, Hou Yifan. Humpy and Deshmukh defeated four of the nine Chinese players who came to Batumi. The FIDE Women's World Cup was another demonstration of India's increasing depth in the women's event. Last year, the Indian women's team, spearheaded by Deshmukh, had claimed a gold medal in the Women's Chess Olympiad, the most prestigious team event in the largely individual sport.

The good news for Indian women chess is that it's not just about Deshmukh and Humpy. In Harika Dronavalli, the country has another veteran who has been around for decades now. And there are players like Vaishali Rameshbabu and Vanitika Agrawal, who will be the torchbearers of women's chess for India in the coming decades. At the World Cup, besides Deshmukh and Humpy, Rameshbabu and Agrawal also made it to the quarter-finals — India had the most representation at that stage. Having conquered the Olympiad and the World Cup, the next step now for the likes of Deshmukh and Humpy will be to qualify for the Women's World Championship — and to win it.



ADITI NAYAR

A LIMITED BORROWING SPACE

Assistance by Centre has played a key role in boosting capital expenditure of states

THE FISCAL HEALTH of the Centre and the states is a key part of the overall macro picture. This article analyses the fiscal trends for a large sample of 17 states governments (excluding Arunachal Pradesh, Assam, Bihar, Goa, Himachal Pradesh, Manipur, Meghalaya, Mizoram, Nagaland, Tripura and Sikkim) for FY2025 and what they augur for the current fiscal and the medium term. These states account for about 90 per cent of India's GDP. Typically, a wide variation has been observed in the states' actual fiscal metrics relative to the Budget and Revised Estimates. Therefore, the focus here is on the trends revealed by the provisional actuals (PA) for FY2025 relative to the actual position in the previous year.

The FY2025 PA indicates a widening in the combined fiscal deficit of 17 states to Rs 9.5 trillion (3.2 per cent of the Gross State Domestic Product or GSDP) from Rs 78 trillion (2.9 per cent of GDP) in FY2024. This was driven by the near-doubling of their revenue deficit to Rs 2.1 trillion (0.7 per cent of the GSDP) in FY2025 PA from Rs 1.1 trillion (0.4 per cent of GSDP) in FY2024, and to a relatively smaller extent by a rise in capital spending (by Rs 678 billion or 0.2 per cent of GSDP).

The spike in revenue deficit levels in FY2025 was due to a moderation in the pace of growth of revenue receipts, which increased to 6.3 per cent in FY2025 from 7.9 per cent in FY2024, amid a stable year-on-year rise of 9 per cent in revenue expenditure. The rise in the states' revenue deficit in FY2025 is in contrast to the compression at

the Centre. A higher share of revenue deficit in the fiscal deficit is not a favourable outcome for state finances. This indicates that the limited borrowing space is partly used towards funding the revenue expenditure, which tends to be less productive compared to capital spending. For instance, the total capital spending of the 17 states in FY2025 PA comprised 78 per cent, lower than the trend during FY2022-24, wherein 80-90 per cent of the fiscal deficit was attributed to capex.

The combined capital spending of the 17 states was Rs. 74.4 trillion in FY2025 PA, Rs 678 billion higher than the amount spent in FY2024. The incremental capex of the states in FY2025 PA was sharply lower than the incremental spending of Rs 910-1120 billion during FY2022-FY2024. Another discouraging trend is the undershooting in capex relative to the Revised Estimates (RE) by Rs 1.1 trillion, once again in contrast to the overshoot seen for the Centre. The capex of the states in FY2025 till the end of February was lower than the spending in the previous year. In March 2025, the states' capex surged by 42 per cent YoY to Rs 2.2 trillion from Rs 1.5 trillion in March 2024, led by a pick-up in spending by Uttar Pradesh, Andhra Pradesh, Madhya Pradesh, Maharashtra, Tamil Nadu and Karnataka. As much as 30 per cent of the annual combined capex of the sample states was incurred in March 2025, a high that has not been seen since spending seen in March 2024. Incidentally,

back-ended capex is one of the reasons that the states' borrowing through state government securities tends to spike in March.

The amounts disbursed by the GoI to the states under the special assistance for capital expenditure (capex loan scheme) in recent years have played a key role in boosting spending on capex. In FY2025, Rs 1.5 trillion was disbursed as capex loans to all states, up from Rs 1.1 trillion in FY2024. Based on the previous shares, the proportion of 17 states in the capex loan in FY2025 is estimated at Rs 1.13 trillion, up from Rs 0.8 trillion in FY2024. This suggests that the increase in the capex loan funded over 40 per cent of the incremental capital spending of the sample set in FY2025.

For the budget estimates of FY2026, 17 states have indicated capital spending of Rs 9.5 trillion, 29.2 per cent higher on a YoY basis or an incremental spending of Rs 2.1 trillion in FY2026, relative to the FY2025 PA. This is double the average incremental capex of Rs 1 trillion during FY2022-FY2024, and appears somewhat implausible.

Beyond FY2026, the recommendations of the Finance and Pay Commissions, as well as changes related to GST compensation cess, will cast an indelible mark on the evolution of state finance. Any incentives towards maximising capex within the permitted borrowing space and fiscal deficit anchor would certainly be valuable.

The writer is chief economist, head-Research & Outreach, ICRA

NOT TOO MATCHA

Demand for matcha now outpaces the supply. For the cool, that is bad news

THE GLOBAL DEMAND for matcha, the rich, strikingly green-coloured Japanese tea lighting up everybody's social media feeds in recent times, has officially outpaced its supply. The explosion in its popularity came after influencers discovered matcha, thanks to an uptick in tourism to and exports from Japan after the Covid pandemic. Since then, it has become a green flag on the road to aspiration — it is a common feature in elite cafes from Gurugram to Los Angeles. But owing to US tariffs on Japan, heatwaves impacting the production of tencha — the leaves matcha is made of — and dwindling numbers of farmers harvesting them, matcha's production and export is falling at an alarming rate. For the hashtag cool kids, that is bad news.

In a world reeling from the chaos of unpredictable trade wars, the matcha story is an example of how even a niche product might be hit by the calculus of demand and supply. Brought to Japan by the Chinese at the end of the 12th century, much of matcha's popularity owes itself to an accidental technique that the Japanese embraced to allow it to grow during the country's harsh winters. They covered it with straw and reed, protecting it set from frost and sun, and allowing its colour to steep. As demand escalates and retailers set limits on how much customers can buy, the Japanese government is now encouraging what was once a carefully curated process to be converted into a larger-scale production of tencha. But that risks sacrificing the quality of matcha.

In the rise and fall of matcha, there is also a larger story that runs alongside the tension driven by contradictory forces in a world in transition — one that features the famous villain called climate change, already wreaking havoc on products as diverse as coffee and gin and tonic. Globalisation enabled matcha's exposure to the world; the move towards protectionism now threatens it. Whether the story will end with a promising sign of matcha is anyone's guess.



JULY 30, 1985, FORTY YEARS AGO

A PROBE IN HARYANA

JUSTICE JASWANT SINGH, retired judge of the Supreme Court, has been asked by the government to hold an inquiry into the charges levelled against Haryana Chief Minister Bhajan Lal by some state Opposition leaders and MPs. The decision to refer this matter to Justice Jaswant Singh was taken at a meeting of the Political Affairs Committee of the cabinet.

AASU DEADLINE

YET ANOTHER ROUND of official-level talks to resolve the foreigners issue in Assam commenced with the agitators threatening to

renew the stir if an acceptable solution was not reached by Independence Day. AASU president Prafulla Mahanta, after the three-hour meeting with R D Pradhan, said there was hope of a solution and added, "We are going to talk on Tuesday again. The threat was conveyed to Mr Pradhan."

NUCLEAR TEST BAN

THE SOVIET COMMUNIST Party general secretary, Mikhail Gorbachev, declared that his country had decided to unilaterally stop any nuclear explosion, beginning August 6. In a statement, he called upon the US to do the same. The ban will begin on the

40th anniversary of the atomic bombing of Hiroshima.

JNANPITH AWARD

THE TWENTIETH JNANPITH Award for the year 1984 has been given to Thakazhi Sivasankara Pillai, popular Malayalam novelist and short story writer. This is the third time that the award has gone to Malayalam. The annual Jnanpith Award of Rs 15 lakh, given for the best creative writing by an Indian citizen in any of the 15 languages, has gone four times each to Hindi and Kannada, three to Bengali, and once each to Assamese, Gujarati, Marathi, Oriya, Tamil, Telugu and Urdu.

SCIENCE

Science retracts arsenic bacteria paper after years of controversy

In 2010, Felisa Wolfe-Simon was hailed for a revolution; two years later, she exited NASA and science; her arc underscored a stark truth: the failures of science can play out just as visibly as its triumphs, leaving questions about how to correct course without crushing the people behind the work

Anirban Mukhopadhyay

In 2010, in the waters of Mono Lake in California, NASA-funded scientists claimed to have found a microbe called GFAJ-1 they said rewrote biology. It had allegedly replaced the phosphorus in its DNA with the toxic element arsenic. The announcement, made at a high-profile press conference on December 2 that year, stunned the world.

The findings, soon published in the journal *Science*, hinted that life could rely on a radically different chemistry. Lead author and microbial geobiologist Felisa Wolfe-Simon declared, "Life as we know it may be due for a revision."

Speculation surged: had NASA stumbled onto alien biology?

Set the ball rolling

On July 24 this year, *Science* announced that it would be retracting the GFAJ-1 paper, nearly 15 years after its splashy debut, citing shifting editorial standards and lingering public confusion.

"It's important to have any groundbreaking work independently evaluated before drawing far-reaching conclusions," University of Minnesota synthetic biologist Kate Adamala said. "We want the public to be excited, but the message must match the strength of the data."

Mainstream media amplified the drama. One headline read: 'NASA Discovers Life Not As We Know It.'

Ivan Oransky, co-founder of Retraction Watch, a site that tracks withdrawn papers and promotes research transparency, and executive director of The Centre for Scientific Integrity, saw the media blitz as pivotal. "Without the hype, this paper might never have been retracted."

He pointed to NASA's style of communication as a key factor in the storm that followed in 2010.

"Historically, NASA hasn't always had a respectful relationship with journalists," he said. "They're great at promoting themselves, and sometimes at overselling."

Peer review in public

To the people at large, the prospect of arsenic life hinted at alien biochemistry. But for many scientists, the GFAJ-1 paper raised more questions than answers. Critics began pointing out that arsenate is unstable in water, so its role in DNA seemed chemically implausible.

"If true, this would have overturned nearly a century of data, but nothing in the chemistry suggested it was possible," Steven Benner, an early critic and chemistry professor at the University of Florida said.

Others were initially intrigued. "I was very excited and impressed. It was a big deal in the origins community," Adamala, then a graduate student, said.

But like many, her enthusiasm waned as flaws emerged. Microbiologist Rosemary Redfield became a leading critic and one of the first replicators to disprove the findings. "It's a fine example of how easy it is for scientists to be misled by an attractive hypothesis and of why we need both formal peer review and informal outside scrutiny."

By late December, the backlash gained traction. Blogs and Twitter (now X.com) turned the paper into a case study on post-publication peer review.

Sheila Jasanoff, professor of science and technology studies at Harvard, noted that while such public spaces can foster valuable crowd-sourced peer review, they also risk overreach.

"These days science, like true crime, has spilled outside the constraints of officially authorised review. However, like



Felisa Wolfe-Simon processes mud from Mono Lake to inoculate media to grow microbes on arsenic. FILE PHOTO

all forms of democratisation, such informal policing can run out of control if it is driven by a mob mentality that is out to shame or undermine a researcher or a research program."

The original team stood by their findings — but by now the tone had shifted.

Evidence falls apart

Over the next 18 months, multiple labs tested the paper's core assertion.

In 2012, *Science* published two studies that refuted it. Redfield's team found no arsenate in GFAJ-1's DNA. Tobias Erb's group confirmed the microbe still needed phosphorus to grow, i.e., it hadn't rewritten biology, just tolerated low-phosphate conditions.

Wolfe-Simon maintained that her team's methods showed arsenic was incorporated into DNA and were robust enough to rebut Benner's contamination claims. *Science* did not retract or flag the paper, saying claims should be resolved by further research, not editorial action. And since no fraud was alleged, the rebutals sufficed.

"The whole debate ends up circling around the semantics of words like 'error', 'fraud', 'misconduct,'" Oransky said. "But this paper, let's be honest, has been understood as unreliable since at least 2012, if not earlier."

Why science took so long

For Benner, the GFAJ-1 paper reflected differences in scientific perspectives. Biologists saw phosphorus as essential, chemists knew arsenate's instability, geologists accepted mineral substitutions, and astrobiologists embraced radical possibilities.

"It wasn't that reviewers were incompetent," Benner said. "They just didn't all speak the same scientific language."

He saw another deeper flaw. NASA's astrobiology community often relies on consensus panels that falter when no one challenges ideas outside their domain.

"Multidisciplinary science is essential," he said, "but when it's superficial, weak claims slip through. This wasn't peer review breaking down; it was different communities assuming they shared standards while working from very different assumptions."

Adamala echoed this concern: "Young scientists in interdisciplinary fields should embrace continuous peer review, as reliance on collaborators' expertise can miss flaws that later scrutiny might catch."

Correction sans closure

"They're right to retract a paper whose high-profile conclusions were entirely



If true, this would have overturned nearly a century of data, but nothing in the chemistry suggested it was possible

STEVEN BENNER
CHEMISTRY PROFESSOR AT THE UNIVERSITY OF FLORIDA

wrong," Redfield said.

One senior researcher noted that the Committee on Publication Ethics (COPE) guidelines, which many journals have adopted as a measure to improve research integrity, justify a retraction if the findings are unreliable. Here, multiple labs found phosphate in the arsenate medium, undermining the paper's core claim that the microbe grew by substituting arsenic for phosphorus.

"The growth experiments at the heart of the paper were flawed," the researchers said. "Even if it was an honest mistake, the core conclusions didn't hold up."

Adamala said that it's a good example of self-regulation in science. "Slowly but surely, mistakes do get corrected." Oransky was more measured: "*Science* is now acting on an expanded definition of retraction that's consistent with what's been possible for a long time but rarely used."

Not everyone sees it as black and white. Jasanoff warned that retractions can erase the very messiness that makes science work.

"Rather than draw hard lines between truth and error, science advances through open debate," she said. "It's better to preserve a record that shows how scientists test, challenge, and refine their ideas, even when plausible claims later prove wrong."

Benner, for his part, expressed worry that broadening retraction policies could weaken the informal scrutiny that exposed the paper's flaws, raising questions about balancing error correction with preserving the scientific process.

Today, the whole saga has transformed into a cautionary tale. Adamala said the controversy may have cast a shadow over exotic chemistry research in astrobiology, making scientists more cautious about bold claims.

Who pays the price?

Wolfe-Simon's rise and fall was swift. In 2010, she was hailed for a potential revolution in biology. Two years later, she quietly exited both NASA and mainstream science, her research career derailed by

controversy and lack of funding. "Good scientists would have responded by getting back into the lab and doing the necessary follow-up work. But these authors still don't admit mistakes," Redfield said, pointing to their rebuttal letter in response to the retraction.

Ariel Anbar, a coauthor of the now retracted paper, said, "*Science* cited no misconduct or specific mistake. We stand firmly by the integrity of our data."

He also criticised the journal for not sharing a blog post it published regarding the retraction with the authors, calling it a breach of COPE guidelines.

Oransky disagreed: "What guideline is this referring to? Furthermore, standing by your data doesn't mean there aren't errors in it."

Anbar also said the team rejected "the alleged error" and that it was raised in 2011 and rebutted in a peer-reviewed exchange.

"They may reject it," Oransky replied, "but that seems to be the rationale for the retraction."

Nonetheless, Oransky also said *Science*'s retraction notice could have been clearer. He explained that retractions often imply misconduct, so when *Science* called the paper unreliable but not unethical, it still put the authors on the defensive.

"You can see that here, they're saying, 'But there was no misconduct. No clear error.'"

Jasanoff said she doesn't see it completely as an individual failure. She argued that the unusually long delay until retraction may reflect less a concern with scientific uncertainty and more a broader institutional tendency to manage reputation, especially in an era of heightened fears over misinformation.

Wolfe-Simon's arc underscored a stark truth: high-risk discoveries bring both acclaim and vulnerability. When science goes public, its failures play out just as visibly as its triumphs, leaving lasting questions about how to correct course without crushing the people behind the work.

A slow machine

Peer reviewers cleared GFAJ-1, and media hype propelled it, but shifting editorial norms more than new data undid it 15 years later. Oransky singled out *Science*'s editor-in-chief, Holden Thorp, for leading that shift.

"Other journals have done it, but he's been consistently engaged in a way that encourages open conversation, no matter whether people agree with specific decisions or not."

That kind of editorial openness, he added, may be the real legacy of the arsenic life saga.

Jasanoff, however, cautioned that every retraction risks erasing the visible, iterative debate that builds trust. "It is better for people to understand that science moves through trial, and error, and gradual self-correction. It is not a binary. All science is provisional."

Benner drew a parallel to the 1976 Viking missions, where a premature "no organics, no life" verdict in *Science* stifled debate.

"Calling the ballgame early had an unfortunate result. It prevented the dialectic scientific process needs."

The arsenic life case endures not because of its flawed claim, but for what it revealed about the pressures shaping modern science: how spectacular findings — especially from institutions like NASA — can short-circuit scrutiny, and how correcting course means confronting the very systems that made such claims irresistible in the first place.

(Anirban Mukhopadhyay is a geneticist by training and a science communicator from Delhi. anirban.genetics@south.du.ac.in)



A Barbados threadsnake atop a US quarter. AFP

World's smallest known snake makes comeback in Barbados

Agence France Presse

For nearly two decades, no one had spotted the world's smallest-known snake.

Some scientists worried that maybe the Barbados threadsnake had become extinct, but one sunny morning, Connor Blades lifted a rock in a tiny forest on the eastern Caribbean island and held his breath.

"After a year of searching, you begin to get a little pessimistic," said Blades, project officer with the Ministry of Environment in Barbados.

The snake can fit comfortably on a coin, so it was able to elude scientists for almost 20 years. Too tiny to identify with the naked eye, Blades placed it in a small glass jar and added soil, substrate, and leaf litter.

Several hours later, in front of a microscope at the University of the West Indies, Blades looked at the specimen. It wriggled in the petri dish, making it nearly impossible to identify.

"It was a struggle," Blades recalled, adding that he shot a video of the snake and finally identified it thanks to a still image.

It had pale yellow dorsal lines running through its body, and its eyes were located on the side of its head.

"I tried to keep a level head," Blades recalled, knowing that the Barbados threadsnake looks very much like a flower pot snake, which is a bit longer and has no dorsal lines.

On July 23, the Re-wild conservation group, which is collaborating with the local environment ministry, announced the rediscovery of the Barbados threadsnake.

The snake is blind, burrows in the ground, eats termites and ants, and lays one single, slender egg. Fully grown, it measures up to 10 cm

"Rediscovering one of our endemics on many levels is significant," said Justin Springer, Caribbean program officer for Re-wild, who helped rediscover the snake along with Blades. "It reminds us that we still have something important left that plays an important role in our ecosystem."

The Barbados threadsnake has only been seen a handful of times since 1889. It was on a list of 800 plant, animal, and fungi species that Re-wild described as "lost to science."

The snake is blind, burrows in the ground, eats termites and ants, and lays one single, slender egg. Fully grown, it measures up to 10 cm.

"They're very cryptic," Blades said. "You can do a survey for a number of hours, and even if they are there, you may actually not see them."

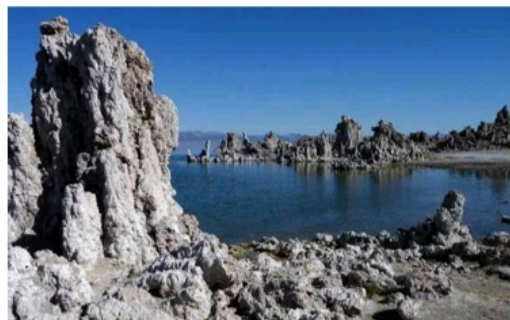
But on March 20 at around 10:30 a.m., Blades and Springer surrounded a jack-in-the-box tree in central Barbados and started looking under rocks while the rest of the team began measuring the tree, whose distribution is very limited in Barbados.

"That's why the story is so exciting," Springer said. "It all happened around the same time."

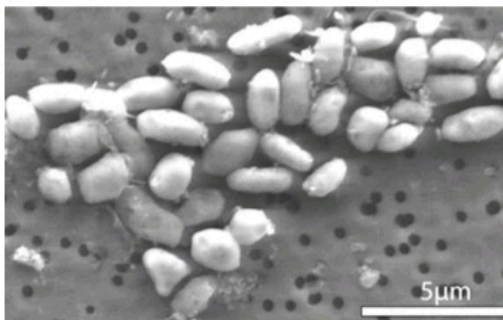
S. Blair Hedges, a professor at Temple University and director of its center for biology, was the first to identify the Barbados threadsnake. Previously, it was mistakenly lumped in with another species.

In 2008, Hedges' discovery was published in a scientific journal, with the snake baptised *Tetracheilostoma carlae*, in honor of his wife.

"I spent days searching for them," Hedges recalled. "Based on my observations and the hundreds of rocks objects that I turned over looking for this thing without success, I do think it is a rare species."



Limestone formations along the shores of Mono Lake. OCTAGON (CC BY)



A microscopic view of GFAJ-1 bacteria. NASA

For feedback and suggestions for 'Science', please write to science@thehindu.co.in with the subject 'Daily page'



Interrupted growth

Industrial growth is still tied to government spends on infrastructure

The Index of Industrial Production (IIP), the nation's monthly barometer of goods output, revealed a 10-month low growth rate in June, at 1.5%, largely due to the sharp contraction in mining activity, by -8.7% (10.3% in June 2024), and electricity output, by -2.6% (8.6% in June 2024). The early onset of the southwest monsoon, with its erratic and uneven distribution, led to water logging in large parts of the mining belts in Odisha, Jharkhand and West Bengal, hampering a key economic activity. Ranchi's regional meteorological office has said that Jharkhand recorded 504.8 mm (against a normal of 307 mm) between June 1 and July 12 - but five districts were categorised as rain deficient. The resultant damage to the power distribution infrastructure and disruptions to supply chains may have contributed to the sluggish growth in industrial output at 3.9% in June, up from 3.5% a year ago. This in turn, is likely to have led to subdued power demand. While mining and power production collectively make up for almost a quarter (22.3%) of the IIP's weightage, the rest is apportioned for manufacturing activities. The robust growth in capital (3.2%), intermediate (5.3%) and infrastructure (7.2%) goods output, indicates that much of industrial growth continues to hinge on the government's infrastructure spends.

There has been a general reluctance, both institutionally and in public economic discourse in India, to explicitly correlate disruptions in economic activity with climate-related events, especially in official narratives such as the IIP or GDP data releases. The Ministry of Statistics and Programme Implementation and the Reserve Bank of India (RBI) tend to frame industrial and economic under-performance in terms of 'high base effects; supply chain bottlenecks; input cost fluctuations; global demand softening; and domestic consumption contraction'. Climate-related disruptions, such as in mining belts, are rarely mentioned in IIP or national accounts commentary. Economic data agencies in India have been slow to integrate climate risk frameworks into routine macroeconomic reporting, unlike institutions such as the European Central Bank or the Bank of England which have begun mapping climate risk to output and financial stability. True, climate attribution is complex: linking a specific event such as waterlogging in a coal mine to broader climate change involves scientific rigour and probabilistic modelling. Policymakers often avoid this due to fear of politicising economic data. Indeed, the RBI's Financial Stability Reports now include climate-related risks. But this has not yet filtered into production-side metrics such as the IIP. The time has come for India to make a systemic shift to integrate climate attribution to economic activity.

Deaths in school

Infrastructure of government schools needs urgent attention

On July 25, tragedy awaited students of Classes 6 and 7 at the Pipildi Government School in Rajasthan's Jhalwar district as they assembled for prayer. A part of their school building gave way leading to the deaths of seven and injuries to several others. Most of the students were from tribal communities. The school is in the southern part of the State bordering Madhya Pradesh. There was a similar incident the next day in Nagaur district but the school was closed being a holiday. There has been much public anger in the State over the incidents which, quite rightly, have thrown the spotlight on the state of government schools. As in UDISE 2023-24 data, there are more than 70,000 government schools in Rajasthan serving nearly 84 lakh students, especially from the poor and marginalised sections. Of these, some 8,000 schools have been estimated by the Education Department to be in a poor condition. The Jhalwar school was not among the schools identified as being in a poor state, indicating the extent of the problems. Some ₹650 crore had been allocated in the past two State budgets for boosting the infrastructure but inefficiencies in government have ensured that the measures did not make much difference. Fixing the infrastructure of government schools should be a priority for the State's Bharatiya Janata Party government.

The tragedy in Rajasthan should serve as a wake-up call across India, given the current policy focus on government-owned education institutions. The National Education Policy (NEP) 2020 had called for an immediate increase in spending on education, from some 4.6% of GDP to 6%, identifying one-time spends on infrastructure as the lead priority besides identifying other sectors for a boost in support. Five years into the NEP, there is little to suggest that this has been a focus area for governments, Union or State. Policy thrusts have been more towards reducing government support, self-financing, and encouraging private sector contribution. While these may be applicable to higher education, basic school education is a primary duty of the government - as it is across the world including in the most developed nations. Setting up model schools and funding them to serve as exemplars cannot be at the cost of mass school education. Foundational Literacy and Numeracy has been identified as a critical area for boosting workforce productivity and reaping the demographic dividend that will soon run its course as India's population ages. But the discourse on pathways towards achieving them is more on pedagogy, non-formal teaching and so on than the essentials - an infrastructure boost and teacher recruitment and training.

Bihar's dark side — the hub of girl child trafficking

She left Chhattisgarh with a small bag and a dream. A man had convinced her family that she would be trained as a dancer, earn well and support them. Her parents, who were desperate and worn down by years of poverty, let her go. By the time she was found in Bihar, she was not the same girl. She had been broken by control, violence and rape. She was 14. Her story is not rare.

Until June this year, the Bihar police rescued 271 girls in the State - 153 of them trafficked into orchestras, the remaining 118 forced into the flesh trade. In Saran district, the number of girls rescued from these 'dance troupes' since January is 162. Between March and June this year, the Just Rights for Children (JRC) partners, working alongside district police forces, rescued 116 girls from orchestra groups.

The conditions in which these girls, stripped of dignity and brutalised into submission, were found were appalling - overcrowded, unhygienic rooms. They were presented on stage as performers, but in reality, they were victims of trafficking and sexual abuse.

Human trafficking is among the largest organised crimes globally. It inflicts severe physical, psychological and economic harm on individuals of all ages, but women and children are the most vulnerable. Once they are pulled in, getting out is almost impossible. Nearly 138 million children were engaged in child labour in 2024, including around 54 million in hazardous work, according to estimates by the International Labour Organization (ILO) and UNICEF.

Bihar as a trafficking destination

Bihar's emergence as one of India's most active destinations for trafficking is not incidental. At the heart of this crisis lies a complete absence of regulatory oversight and social acceptance for girls being commodified. Geography and poverty deepen this vulnerability. The State's porous border with Nepal and seamless railway connectivity to trafficking prone States such as West Bengal, Jharkhand, Odisha, Chhattisgarh, Assam and Uttar Pradesh facilitate trafficking flows through Bihar.

In States such as West Bengal, where music and dance are integral to cultural identity, parents encourage their daughters to pursue the arts. These aspirations are preyed upon by traffickers who promise good money and even stardom. False promises of love, marriage or employment are also used to lure girls. In districts such as Saran, Gopalganj, Muzaffarpur, Rohtas and West Champaran - the 'orchestra belt' - girls, some as young as 12, are being sold to orchestras for as little as ₹10,000. They are forced to wear inappropriate clothing and dance to vulgar songs before inebriated men. The



Bhuvan Ribhu
is a child rights activist and the Founder of Just Rights for Children

girls are punished if they refuse and raped if they resist.

How the system fails children

According to the National Crime Records Bureau data, 2,878 children were trafficked in 2022, including 1,059 girls. This is a figure that barely scratches the surface. Many cases never reach a police station because families are either complicit or fear to speak. The laws are not adequate, but in fact, comprehensive. The Immoral Traffic (Prevention) Act, the Juvenile Justice Act, the Protection of Children from Sexual Offences (POCSO) Act, the Bonded Labour System (Abolition) Act, the Child and Adolescent Labour (Prohibition and Regulation) Act, and provisions under the Bharatiya Nyaya Sanhita criminalise child labour, trafficking and sexual exploitation.

But conviction rates remain abysmal. Most cases are filed as kidnappings or missing person reports. Anti-Human Trafficking Units (AHTUs) are under-resourced. Investigations that concern jurisdictional confusion and bureaucratic delay. When girls are rescued, many are sent right back to the same families that sold them.

Despite rescue after rescue, orchestras in Bihar continue to operate with impunity. Just Rights for Children, a network of over 250 NGOs working to end violence against children, approached the Patna High Court seeking urgent prohibitory orders against orchestras. The petition calls for an immediate ban on the employment of minors in orchestras.

In response, the High Court directed the Bihar government to act without delay, recognising the trafficking and exploitation of children in orchestras to be a "serious issue". Such an acknowledgement must translate into protection at every stage of the trafficking chain.

Prevention must begin where trafficking begins. Schools must monitor attendance. When a child goes missing for weeks, it must trigger alerts and reports. Panchayats must maintain migratory registers. When children disappear, someone in the village always knows and that someone must be required to act. Parents should be made aware of what might happen to their daughters.

Transport vigilance must be ramped up. The Railway Protection Force (RPF) has been monitoring vulnerable corridors and conducting awareness drives at railway stations. This model must extend to inter-State bus routes, local terminals and private carriers. Transport departments must train their staff to identify signs of trafficking.

AHTUs need full-time officers trained to coordinate measures across borders, track

networks and follow a case from rescue to prosecution. They should be held accountable.

There should be an immediate and absolute prohibition on the employment of minors in orchestras. These groups must be identified, mapped and regulated. Premises where girls are confined must be sealed. Owners, landlords and organisers must be prosecuted and their assets must be attached. The Labour Department must be mandated to inspect, report and act. Prosecution must be time-bound and rehabilitation must be long-term and state-supervised. Children must not be sent back to the environments that enabled their exploitation. Victim compensation schemes must be enforced rigorously.

Prevention is protection. Prosecution is protection. Prosecution is prevention. Trafficking is not the failure of a few systems. It is the collapse of many. Laws and enforcement are only one part of the solution. Ending exploitation is possible through prosecution.

The Centre for Legal Action and Behaviour Change (CL-AB) recently released a report, 'Building the Case for Zero: How Prosecution Acts as the Tipping Point to End Child Labour - The Case from India', that drew data from 24 States. It showed that prosecution is key to securing justice. Along with law enforcement, the NGO network rescued 53,651 children from trafficking and kidnapping (in 27,320 raids), pursuing legal action in every case. Nearly 90% of these children were trapped in the worst forms of child labour.

A strategy rooted in prevention

To succeed, we need a strategy rooted in prevention, and we need to call it PICKET. First, it begins with 'Policy' - strong and clear policies that prohibit child labour and exploitation. Second, 'Institutions' must be required to monitor, prosecute and rehabilitate. Third, the 'Convergence' of agencies, digital infrastructure and survivor-centred response is essential to combat trafficking. Fourth, 'Knowledge' is key where community awareness and intelligence gathering are crucial. The insights of survivors are among the most powerful tools we have to dismantle trafficking networks. Fifth, 'Economically', trafficking must be made unviable. And, sixth, 'Technology' must be used to track traffickers, build databases, generate heat maps and predict movement patterns. None of this will work unless States share data, digitise case records and cooperate.

Justice is not punishment, but it is prevention before harm. The only way to prevent the next girl from being trafficked is to dismantle the system that allows it. We have the tools. We have the laws. All that remains is the will. The longer we wait, the more we lose.

The State must act against the system of 'dance troupes' and 'orchestras' that fuel trafficking, which is also made worse by an absence of regulatory oversight, geography and poverty

Adopt formalisation to power productivity growth

In recent decades, India's formal manufacturing sector has witnessed a significant negative change in its employment structure. According to the Annual Surveys of Industries (ASI), the share of contract labour in the manufacturing workforce doubled from 20% in 1999-2000 to 40.7% in 2022-23, cutting across all industries. The growing trend towards informalisation within the formal sector has been widely written about in academic and policy circles. Our study, based on plant-level ASI longitudinal data (1999-2000 to 2018-19) at an all-India level, reveals that contractualisation is detrimental to productivity when misused, highlighting the need to promote formalisation to sustain long-term productivity growth.

Plight of contract workers

The shift towards contractualisation is often viewed as a strategy to enhance operational flexibility and access specialised skills and when required. However, examination of the plight of contract workers suggests that cost avoidance, rather than genuine labour flexibility or skills, is a major factor driving their growing use. Contract workers, typically hired through third-party contractors, are excluded from core labour laws under the Industrial Disputes Act 1947, which governs layoffs, retrenchments, and safeguards against arbitrary dismissals. Consequently, their bargaining power remains weak, leaving them vulnerable to exploitation. The wage payments of contract workers in 2018-19 were 14.47% lower than their regular counterparts. The unfavourable wage differentials against them were more pronounced in large enterprises (31%), followed by medium and small enterprises (23% and 12%, respectively). Furthermore, if we consider the difference in the overall labour cost for employers on contract and regular workers, the disparities look even starker. The average daily labour cost to the employer for contract workers was 24% lower when compared to regular workers. The labour costs on contract workers were less than 50% of that on regular workers, in at least nine three-digit level



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Contractualisation in India's formal manufacturing is linked more to cost avoidance than to being a focus on genuine labour flexibility or skills

industries. In some industries, labour-cost gaps were as high as 78% to 85%, reflecting the severe level of exploitation that contract workers face.

Impact on productivity

Undoubtedly, contract workers can bring job-specific skills and serve as a buffer, enabling firms to respond swiftly to market fluctuations. However, contractual employment, particularly when mediated through third-party contractors for the short term, can suffer from principal-agent problem, i.e., the misalignment of long-term interests between employers and contractors. This can lead to moral hazard issues, such as an increased likelihood of worker shirking. Moreover, short-term employment contracts can create instability in the workforce due to high labour turnover, discouraging investments in on-the-job training and innovation, stifling productivity growth in the long run.

Our analysis of real net value added per worker, a standard measure of labour productivity, shows that contract labour-intensive (CLI) enterprises have, on an average, 31% lower labour productivity when compared to regular labour-intensive (RLI) enterprises. The labour productivity gap remains higher especially in small formal enterprises with less than 100 workers (36%), followed by medium-sized enterprises with 100-300 workers (23%). The unfavourable productivity gap for CLI enterprises further widens to 42% in labour-intensive enterprises. These differentials remain significant even after controlling for firm-specific and state-specific factors that could influence labour productivity.

The negative productivity differentials observed in relatively small, medium, and labour-intensive CLI enterprises may be attributed to their higher propensity to employ contract labour as a cost-cutting measure or as a means to circumvent regulations. These are practices that ultimately prove counterproductive in the long run.

However, labour productivity was 5% higher in

high-skill CLI enterprises when compared to their low-skill counterparts, with the productivity advantage increasing significantly to 20% in large high-skill CLI enterprises. Similarly, large-size capital-intensive CLI enterprises recorded a 17% gain in labour productivity. However, such types of enterprises account for only about 20% of the total formal manufacturing. The remaining 80% of the enterprises were adversely affected by contractualisation.

Policy suggestions

The central government, in 2020, introduced a labour code on industrial relations, which aims to provide greater flexibility in hiring and firing. The code allows firms to hire non-regular workers on fixed-term contracts directly without third party contractors, though it also seeks to curb the exploitation of non-permanent workers by mandating the provision of basic statutory employment benefits. However, as the labour code awaits implementation, labour unions warn that the increased flexibility in hiring non-regular workers could accelerate informalisation and further erode quality of jobs in the formal sector.

Policymakers can incentivise firms to adopt reasonably longer fixed-term contracts by offering concessions in social security contributions or subsidised access to government skill programmes. This could enhance workforce stability and support skill accumulation, while also assuaging labour union fears about the potential rise in the precarious employment.

Similarly, the Central government in 2016 implemented the Pradhan Mantri Rojgar Protsahan Yojana (PMRPY) to incentivise job creation in the formal sector by bearing employer's contribution (12%) to Employees' Pension Scheme (EPS) and Employees' Provident Fund (EPF). Though over one crore employees benefited from the scheme, it was discontinued in March 2022. Reviving and extending support under the PMRPY could help curb the misuse of contract labour and promote formalisation in the manufacturing sector.

LETTERS TO THE EDITOR

On Ayurveda

We write this letter as the President and the Central Secretary, respectively, of the Ayurveda Medical Association of India (AMA). While the question of "integration" and the extent of clinical practice by practitioners of Ayurveda is open for public and policy-level discourse, the

article (Editorial page, July 29) unfairly singles out a government-recognised and government-approved system of medicine. It selectively quotes legal provisions, ignoring judicial pronouncements and the evolving nature of India's medical pluralism. Under Indian law, the terms doctor, vaidya, and hakim

are considered synonymous when it comes to legitimate and recognised systems of medicine, including Ayurveda, Siddha, and Unani. This recognition has been established through court rulings and government notifications, especially after the enactment of The Indian Medicine Central Council

Act, 1970, and policies supporting AYUSH. The article fails to acknowledge the acceptance Ayurveda enjoys today, as a scientific

and evidence-based holistic medical system.
Dr. K.S. Vishnu Hambhoorthi,
Dr. P.K. Haridas,
Thiruvananthapuram

Corrections & Clarifications

The existing electoral roll was published in Bihar on January 7, 2025, and not 2015 as mentioned in a report, 'Focus on inclusion, not exclusion, SC tells EC' (News page, July 29, 2025).

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New queen

That Divya Deshmukh is the new chess queen is wonderful news. Parents and teachers need to identify children with an interest in chess.
Guidipati Anirudh,
Secunderabad

Letters emailed to letters@thehindu.co.in must carry the postal address.

Why the Gini Index is wrong about India

The Gini Index ranked India among the world's most equal societies, by giving the country a score of 25.5. This places India in a "moderately low" inequality category. While this may be cause for celebration, the lived reality in India paints a very different picture. Inequalities, lived and those captured in statistics, permeate into everyday life in urban and rural India. The question that therefore arises is, on what basis can India be considered one of the world's most equal societies? While there is sufficient critique on the flawed methodology used in the Gini Index, this article highlights the general state of inequality that plagues India. While gender, economic, health, educational, and social inequalities have always been endemic to India, with technology and a modern ways of life, new forms of inequality such as digital and banking inequality have arisen.



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large part of the population has to rely on the informal sector for employment, earning significantly less than those employed in the formal sector.

Gender inequality is another fundamental form of inequality in India. Women have historically been marginalised from the workforce and comprise about 35.9% of the worker population ratio. The number is starker at senior and middle management levels where women accounted for only 12.7% leadership roles as of 2024. While India has the third largest startup ecosystem in the world, women-run start-ups stand at only 7.5% of all active startups in the country. Social norms aggravate gender inequality in terms of spending family resources on the girl child, and in matters of inheritance.

With rapid development of technology, access to digital technology is crucial to broadly navigate through modern day life such as easily accessing formal banking channels. While India has made commendable progress in providing access to the Internet to a large part of the population, a careful analysis of the numbers points to a severe digital divide. Lack of access to the Internet and to digital technology exacerbates the digital divide, leading to lack of opportunities for a certain demography.

For instance, only 52.7% schools have functional computers, and Internet is accessible in only 53.9% of schools across India. This contributes to the digital divide because only students from a certain socio-economic background, who have access to schools with functional computers and the Internet, will be able to use the use of technology and computers, a critical skill in today's times.

Access to quality higher education and even basic entry-level jobs are difficult for students left behind. They are then pushed into employment that requires lower skills. This digital divide will continue to

perpetuate the cycle of inequality at the household level.

Other forms of digital technology also contribute towards fuelling educational inequality. For instance, combined access to broadband within households, encompassing both urban and rural areas, stands at 41.8%. This deepens educational inequality because when education becomes virtual, which is a routine occurrence in New Delhi when schools are closed during November and December because of severe air pollution, only those students in households with access to a broadband system and digital technology can continue with their education.

Inequality across realms
Inequality in one realm often permeates into other realms. For instance, digital inequality severely affects the lower income demography. However, overall, digital inequality affects women more than men. For example, only 25% of women in rural India have access to the Internet, compared to 49% of men in rural India. The Internet is a fundamental medium in accessing opportunities and technology such as Internet banking. It guarantees financial freedom and job postings. Lack of access to the Internet disables women from accessing these opportunities that are readily available to male adults, further exacerbating digital and gender inequality.

While we have reasons to pat ourselves on our backs for achieving some amount of equality in the last few years, the methodology to adjudge the ranking by Gini Index, seen along with actual and lived realities, makes one wonder as to how we achieved this ranking. It is only when a large part of the population has access to equal opportunities can we truly be among the world's most equal societies. Until then, as a society and a country, we have a lot of groundwork to cover in bridging all forms of divide.

From glory to decline

Gangakonda Cholapuram does not need statues; it needs basic infrastructure

STATE OF PLAY

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marked the Aadi Thiruvathirai festival, which is organised every year in Gangakonda Cholapuram, about 105 kilometres from Tiruchirappalli in Tamil Nadu, to mark the birth anniversary of Rajendra Chola I (1012 to 1044 CE). The festival, which the DMK government in the State began holding from 2022, became a high-profile event this time thanks to Prime Minister Narendra Modi's participation in the valediction ceremony. The festival also coincided with the completion of 1,000 years of the maritime expedition of the Chola emperor to Southeast Asia and the commencement of the construction of the iconic temple.

In his book, *A History of South India: From Prehistoric Times to the Fall of Vijayanagar*, historian K.A. Nilakanta Sastri states that Rajendra Chola's empire was "the most extensive and most respected Hindu state of his time." Gangakonda Cholapuram, established by the Chola ruler, served as the capital of the imperial Cholas for about 250 years (1025 CE-1279 CE). Along with the Brihadeeswara temple in Thanjavur, built by Rajendra Chola's father, Rajaraja Chola I, the temple at Gangakonda Cholapuram was included by UNESCO in 2004 under the category of 'Great Living Chola Temples' and declared a World Heritage Site.

On July 27, Mr. Modi spent about two hours at the temple. Unlike most of his public events, which are characterised by formal speeches and the inauguration of projects and schemes, this event was

different. Wearing a white dhoti, a half-sleeve shirt, and an *angavastram* (upper cloth), the Prime Minister enjoyed devotional renderings by a group of *Oduvars* (hymn singers) and by music director and composer Ilaiyaraaja. In his speech, Mr. Modi praised the contributions of the Cholas and explained how their rule remains an inspiration for modern India.

The Cholas undoubtedly set a benchmark in various aspects of governance. However, their erstwhile capital is today one of the most backward districts of Tamil Nadu, Ariyalur. It is hard to believe that it was once the seat of power of a great empire for 250 years.

"It is all fine for the Prime Minister to announce the installation of statues for the two Chola emperors. But people in the district had expected him to unveil plans for infrastructure development in the region," said N. Dhanapal, a resident of Thirumanur village in Ariyalur district. "We thought he would make a statement on the approval of two long-pending railway projects - from Kumbakonam to Namakkal through Ariyalur and Perambalur, and one connecting Pattukkottai, Thanjavur, and Ariyalur. We were disappointed," he added.

A predominantly agrarian district, Ariyalur has cement factories. These were established by large companies gi-

ven the availability of good quality limestone in the region. After a spell of severe pest attacks about five years ago, farmers virtually stopped raising sugarcane. "The sugar mill that we had barely functions," a resident complained. Though the Small Industries Development Corporation set up an industrial estate at Malur in the district about 10 years ago, it found few takers.

The district has a fossil tree park and a fossil museum, which are examples of palaeozoology. In fact, the geological community regards the Ariyalur region as important as the Grand Canyon in Arizona, U.S. Yet, the place barely gets any visibility.

In fact, despite being a World Heritage Site for more than 20 years, even the Gangakonda Cholapuram temple does not attract as many international visitors as it should, primarily due to connectivity issues and lack of amenities. It is not that there have not been efforts made to improve the district. On the eve of the festival, Chief Minister M.K. Stalin had announced that the Chola Gangam Lake, locally known as the Ponneri lake, would be developed at a cost of ₹12 crore, and that facilities for tourists would be improved at a cost of ₹7.25 crore. He also said that renovation work of channels around the tank and other maintenance works would be undertaken. The State government has also planned to construct a museum, spread over 10 acres, at the cost of ₹22.10 crore.

However, these plans are not enough. What the people of the district, which was the seat of the ancient capital of the Cholas, want today is sustained attention and focus on economic development of the region. That is what finally matters to them.

Forms of inequalities

One of the fundamental forms of inequality is wealth inequality. A ride through any busy street in urban India in a luxury car which costs an average of ₹30 lakh, driven by a chauffeur who earns and supports a family on approximately ₹3 lakh per year, will highlight the stark wealth inequality that exists. Statistics also supports this reality. According to a study titled 'Income and Wealth Inequality in India, 1922-2023: The Rise of the Billionaire Raj', in 2022-23, 22.6% of the national income went to just the top 1% of the population.

Further, the study mentions that data on wealth inequality is challenging to capture because of the large-scale prevalence of informal employment, low-income levels, and high thresholds for non-taxable incomes, which means that data on tax pertains to less than 10% of the adult population. The reason for the lack of data itself is indicative of inherent wealth inequality, as a

India has a lot of groundwork to cover in bridging all forms of divides

Free bus schemes help, but rural India pays more to travel

The share of bus expenditure out of total conveyance expenditure is 20.6% in rural India

DATA POINT

Cleodine Fernandez and Mohd. Tahoor

The latest World Bank report has commended India for pulling 171 million people out of poverty. Using the formulation of \$2.15 a day as the poverty line, it has said that extreme poverty fell from 16.2% in 2011-12 to 2.3% in 2022-23. However, how has the consumption basket of India changed?

The Household Consumption Expenditure Survey (HCES) provides an understanding of where and how India is consuming. As of 2023-24, the per capita household expenditure was ₹4,122 in rural India, and ₹6,996 in urban India. The total consumption expenditure for a household can be broadly categorised into food and non-food. In 2023-24, food accounted for 47% of expenditure in rural India, and 39% in urban India. When compared to earlier years, the share of food expenditure is lower. It is interesting to understand which non-food items account for a higher share of the consumer's wallet. All expenditures in the story are per capita, unless mentioned otherwise.

Expenditure on conveyance formed the biggest share of non-food expenditure for an average Indian consumer. Conveyance includes bus, metro, flights and other modes. The conveyance expenditure accounts for 14% of total non-food expenditure across rural and urban India. Of these, bus expenditure contributed to 20% of the total conveyance expenditure. Given the lower per capita income in rural India, households are largely reliant on buses as their primary mode of transport.

Across all major States, bus travel accounts for a higher share of conveyance expenditure in rural areas when compared to urban ones. The share of bus expenditure to total conveyance ex-

penditure is 20.6% in rural India, but only 16.2% in urban India (Chart 1). One reason is the availability of other modes of transportation in urban areas. Moreover, there is significant State-wise variation in the share of bus expenditure. For instance, rural households in Tamil Nadu, and Kerala spend 25% of the total conveyance expenditure on bus travel while in Uttar Pradesh, Odisha, Karnataka and Haryana the spend is less than 20%. Underscoring the importance of bus travel as a mode of transportation, certain State governments have provided free bus services for women. In 2019, Delhi became the first State to offer this. As of 2025, Delhi, Tamil Nadu, Karnataka, Kerala, Telangana, Punjab and Jammu & Kashmir are the seven States that offer this for women. However, there is mixed evidence of the impact of the scheme on household consumption expenditure on buses. For Delhi, Karnataka, and Telangana, there has been a decline in bus expenditure in rural and urban areas. However, in Tamil Nadu and Kerala, household bus expenditure has increased from 2023-23 to 2023-24. At an all-India level, while bus expenditure has decreased by 4% in urban India, it has increased by 0.6% in rural India (Chart 2).

Thus, the effect of the transport policies is less pronounced in rural areas. This data is a wake-up call for policymakers to improve the transportation infrastructure, especially in rural India, and provide greater accessibility and affordability. Moreover, while one would expect that lower-income households rely more on buses than higher-income households, data suggest the opposite. The share of bus expenditure to conveyance expenditure is greater among higher income households than lower-income households. One possible explanation is that lower-income households are engaged in the agricultural sector, where transportation requirements are mini-

mal. On the contrary, higher-income households might avail bus services more frequently due to work commute. To understand this further, we assess the association between non-agricultural workforce participation and the share of bus expenditure to the total conveyance expenditure in urban India. The analysis suggests that there is no significant association (Table 3). Hence, this implies that per-capita bus expenditure is not associated with non-agricultural workforce participation. This tends to suggest that urban households are not using bus services just for labour market opportunities alone - a point that policymakers should take into account.

Policies and infrastructure should be developed to cushion the cost of conveyance expenditure. First, States should transition from Internal Combustion Engine buses to electric buses. This will reduce the cost for the transportation department, leading to lower ticket prices. Second, the supply of buses should increase. India has only 1.5 lakh buses, with an average of only 17 buses per one lakh people. The Ministry of Housing and Urban Affairs recommends 60 buses per one lakh people, yet many cities have fewer than 10. While Tamil Nadu, Karnataka, and Telangana have approximately 20 buses per one lakh population, Punjab, Uttar Pradesh, and Odisha have fewer than 10.

Third, it is imperative that the quality of buses is improved, alongside better affordability. Reducing the conveyance expenditure for households, will allow them to repurpose this share of expenditure into other categories that will improve the overall quality of livelihood.

Cleodine Fernandez is a research fellow at The Indian Council for Research on International Economic Relations (ICRIER). Mohd. Tahoor was a research intern at ICRIER and is currently a student of Economics at Azim Premji University

Missing the bus?

The data for the charts were sourced from the Household Consumption Expenditure Survey 2023-24

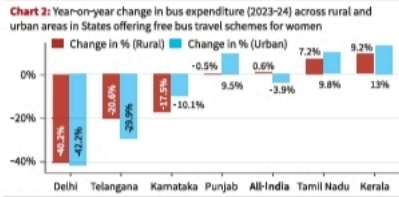


Table 3: The non-agricultural workforce participation and the share of bus expenditure to the total conveyance expenditure in urban India, in select States

State	Non-agricultural workforce participation rate (%)	The share of bus to total conveyance expenditure (%)
Three States with the highest non-agricultural workforce participation rate		
Delhi	99	7.1
Kerala	73	22.1
Punjab	72.7	15.2
Three States with the lowest non-agricultural workforce participation rate		
Chhattisgarh	36.1	7.7
Madhya Pradesh	38.4	17.8
Uttar Pradesh	44	14.1

FROM THE ARCHIVES

The Hindu

FIFTY YEARS AGO JULY 30, 1975

What caused poisonous gas in Apollo

Honolulu, July 29: Failure to throw two switches in the final minutes of their mission set off a sequence that resulted in poison gas streaming into the spacecraft of the three Apollo astronauts, space officials said.

Dr. Glynn Lunney, the Technical Director for the Apollo-Soyuz Mission, said that astronauts Stafford, Brand and Slayton failed to throw a switch to start the automatic landing system of the spacecraft fell towards the Pacific Ocean.

"This may have happened as a result of the crew's attention being diverted," said Dr. Lunney. There was an unexplained squeal on communications lines and it might have made the astronauts fail to throw the proper switches.

Moments later the astronauts manually jettisoned a spacecraft apex cover and deployed the parachutes, but did not shut off a small rocket thruster system.

The rocket thrusters fired rapidly in an apparently automatic effort to control the spacecraft's altitude. Then the crew quickly shut down the rocket thrusters.

However, said Dr. Lunney, vapours in the line were discharged and sucked into the cabin through an intake valve.

According to on-board tapes, he said, "there was a fair amount of coughing."

"The crew were recovering from their surprise and they activated the earth landing system," said Dr. Lunney, even though they were suffering from eye irritation and coughing.

The astronauts manually deployed the main parachutes at 9,000 feet, a thousand feet lesser than usual.

The spacecraft tumbled down and immediately spun over placing the astronauts upside down and still coughing from the poison vapours.

A HUNDRED YEARS AGO JULY 30, 1925

Sea bathing club, Madras

A surveyor has, we understand, been deputed by the Revenue Department to measure out the land (near Queen Mary's College), the lease of which had been applied for by the Sea Bathing Club. The premises of the Club will extend 50 feet east, 100 feet west and 150 feet north and south from the foundation stone. The buildings will be very near the high-water mark.

Text & Context

THE HINDU

NEWS IN NUMBERS

Tiger deaths that occurred outside tiger reserves since 2021

50 In per cent. More than half of the tiger deaths in India between 2021 and the end of 2025 have occurred outside protected reserves, with Maharashtra and Madhya Pradesh accounting for the highest numbers. According to NTCA, 341 tiger deaths occurred outside tiger reserves. PH

Number of countries to join International Big Cat Alliance

24 The International Big Cat Alliance (IBCA) is an India-led global initiative to protect seven species of big cats. 12 countries — India, Armenia, Bhutan, Cambodia, Ethiopia, Eswatini, Guinea, Liberia, Nicaragua, Rwanda, Somalia and Suriname — are members of the alliance. PH

Cost of U.S. tariffs on Poland as per preliminary estimates

2.16 In \$ billion. The new U.S. tariffs on European products could cost Poland around \$ billion zlotys (\$2.16 billion), according to preliminary estimates. Poland does not export many products directly to the U.S., but expects to suffer knock-on effects. PH

Cost of Arunachal's plan to transform the State's power sector

6,519 In ₹ crore. The Arunachal Pradesh government rolled out a ₹6,519-crore plan to transform the State's power sector, aimed at reducing losses, by modernising the electricity grid, and ensuring a reliable power supply. PH

Estimated increase in collections from surcharges in 2025-26

13 In per cent. The Centre aims to collect less of over ₹4.18 lakh crore in the current fiscal, an 8% growth over the collections as per the Revised Estimates of Union Budget FY25. Collections from surcharges are expected to increase to over ₹1.72 lakh crore. PH

COMPILED BY THE HINDU DATA TEAM

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What did the ICJ say on climate obligations?

How has the advisory opinion of the International Court of Justice reiterated the fundamental principles of the United Nations Framework Convention on Climate Change? What does the opinion state about Common But Differentiated Responsibilities and Respective Capabilities? Does it introduce any new obligations?

EXPLAINER

T. Jayaraman
Tejal Kanitkar

The advisory opinion of the International Court of Justice (ICJ) on the obligations of countries to reduce anthropogenic greenhouse gas emissions, and the legal consequences of the harm occasioned by their failure to meet these obligations, on July 23 has been the subject of much discussion. While it is a welcome affirmation of the multilateral climate regime at a time when the U.S. appears to have damaged it through its withdrawal from the Paris Agreement, it also raises questions on, inter alia, its interpretation of the temperature goals of the Paris Agreement and its occlusion of the development imperatives of the global South.

How has it upheld the case for the global South?

The ICJ's opinion has several elements that the global South, including India, should be able to welcome. First, the Court has emphasised the significance of the totality of the climate regime, including the United Nations Framework Convention on Climate Change (UNFCCC), the Kyoto Protocol and the Paris Agreement. This is in sharp contrast to the view of developed countries that have argued for sidelining the Convention and dismissing the Protocol, stating that the Paris Agreement had become the sole binding instrument of the multilateral climate regime. Across several paragraphs in its opinion, the Court has set out how the obligations of countries, especially those of developed nations, flow from various articles of the UNFCCC, particularly the provision of extending climate finance, technology transfer and capacity building to developing countries by developed nations. In underlining the foundational role of the UNFCCC, the Court has also reiterated the significance of the Convention's Annex-I and Annex-II, noting that the developed countries listed therein will continue to have additional obligations compared to the rest of the world. This is a firm rebuttal, not only to the governments of the global North, but also to a vocal section of climate academia, that had proclaimed the end of Annex-based differentiation since the Paris accord was signed.

In yet another affirmation of the global South's perspective, the ICJ opinion identifies the principle of Common But Differentiated Responsibilities and Respective Capabilities (CBDR&RC), drawing on Article 3 of the Convention, as the "core guiding principle for determining the implementation of the climate change treaties". Further in para 152, it affirms universality to the CBDR&RC principle, noting that it "guides the interpretation of obligations under international environmental law beyond its express articulation in different treaties", opening up the possibility for extending the principle to areas like biodiversity.

Additionally, the ICJ's opinion notes the qualification to differentiation between developed and developing nations introduced by the Paris Agreement with the addition of the phrase, "and in the light of national circumstances" to the term CBDR&RC. The Court views the qualification as a nuance which points out that what constitutes a "developed" or "developing" nation is not static. This will undoubtedly be a bone of contention in further interpretations of this opinion.



Climate action now: Villagers gather around a well to draw water in Telamwadi, northeast of Mumbai, India, on May 6, 2023. AP

What about the temperature goal? While these reaffirmations of the fundamental principles and values of the climate regime are noteworthy there is also much in the opinion that conforms to the narrative that developed countries, allied with some of the small island states and a range of vulnerable developing countries, have attempted to build over the years in interpreting the Paris Agreement.

The opinion insists that the temperature target for limiting global warming as in Article 2.1 (a) of the Paris Agreement, no longer holds in defining the obligation of states. Article 2.1 clearly designates "well below 2 degrees Celsius above pre-industrial levels" as the primary goal, while "pursuing efforts to limit the temperature increase to 1.5 degrees C."

However, the Court argues that two paras from decisions of the 26th and 28th Conference of Parties of the UNFCCC, in which Parties have expressed agreement with the need to pursue efforts to limit temperature increase to 1.5 degrees Celsius, constitute an agreement among Parties to rewrite the temperature goal of the Paris Agreement itself. Hence, the opinion concludes, Parties' mitigation efforts must be aligned with collectively achieving the 1.5 degrees Celsius goal and not the range provided in the Agreement. This is a strange conclusion considering that the 1.5 degrees Celsius threshold is likely to be passed in a very few years. Nor does the opinion engage itself with the consequences of the breach of the 1.5 degrees Celsius goal. Even to lay opinion, it appears very odd that decisions taken in implementing an agreement should be interpreted as modifying the terms of the agreement itself.

Much of the Court's enthusiasm for the 1.5 degrees Celsius target appears to stem from uncritical cherry-picking of a few headline statements from the Sixth Assessment Cycle reports (AR6) of the Intergovernmental Panel on Climate Change (IPCC). The Court has not considered it necessary that the IPCC reports themselves should be subject to scrutiny through the lens of equity. This is evident when it uncritically cites the IPCC's global target of GHG emissions reduction of 43% below 2020 levels by 2030 and 65% by 2035 for limiting

temperature rise to 1.5 degrees Celsius. The recently concluded annual climate meeting of the UNFCCC held at Bonn, Germany, itself has now acknowledged the lack of equity and CBDR&RC in such projections.

Has the Court broken new ground on enforcing obligations?

Despite the extensive discussion on the obligations of states, in the context of climate laws and more generally in international law, the opinion does not articulate a more stringent framework of enforcement. In direct continuity with the established interpretation of the Paris Agreement by the global North, it holds that the provision of means of implementation as well as domestic mitigation action are only obligations of conduct (this means a duty which is to be performed towards achieving an outcome rather than guaranteeing the outcome itself). Only procedural aspects of the Paris Agreement, such as the timely and periodic submission of Nationally Determined Contributions are held to constitute stronger obligations of result. The opinion argues that even as obligations of conduct, the requirements on countries to meet their commitments can be sufficiently stringent. However, it depends on suitable courts with the requisite jurisdiction to enforce them and is contingent on the circumstances of every individual case.

At best, the Court's opinion may be welcomed for reiterating the original intent of the Paris Agreement, in the face of the growing reluctance of developed nations to meet their obligations, but it breaks no significant new ground in this regard. Given the lack of appetite for climate action in the global North, and their opposition to even these weak obligations, the reiteration by the Court is undoubtedly of some value.

What are some of the gaps in the opinion?

The most striking lacuna in the opinion is its near-total sidelining of the twin challenge that global warming poses to the development of the global South, that is extensively discussed even in the IPCC. On the one hand southern nations will be increasingly unable to meet their energy needs for rapid poverty eradication and

sustainable growth in the absence of adequate carbon space, while on the other hand low-carbon development requires finance and technology on a scale that remains out of reach.

As Judge Xue Hanqin notes, in concluding her separate opinion, "the Advisory Opinion fails to point out that, for peoples and individuals of the present and future generations affected by the adverse effects of climate change, the ultimate solution to guarantee them a clean, healthy and sustainable climate lies in a supportive and open international economic system that would lead to sustainable economic growth and development in all states based on international co-operation between developed and developing states."

With the opinion falling short on these two key issues for the global South, its qualification that equity and CBDR&RC would introduce no new obligations but only guide the interpretation and implementation of climate treaties, should be a matter of concern for developing countries. Much of the enthusiasm in global civil society for the opinion, stems from the prospect of further litigation at the national or regional level, with the opinion allowing the possibility that affected countries such as small island states could claim reparation or compensation. However, the opinion also makes clear that these would require independently establishing attribution, "wrongfulness" and causation regarding the actions of Parties held responsible for harm, though it opens the door to their more expansive interpretation.

On the issue of concerted global climate action though, and at the climate negotiations, it is unlikely that the advisory opinion would substantially move the needle, reproducing existing fault lines rather than overcoming them. As several of the separate opinions from various judges themselves indicate, the opinion may represent a missed opportunity rather than a game-changing intervention in the global climate discourse.

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THE GIST

The ICJ opinion identifies the principle of Common But Differentiated Responsibilities and Respective Capabilities (CBDR&RC), drawing on Article 3 of the Convention, as the "core guiding principle for determining the implementation of the climate change treaties".

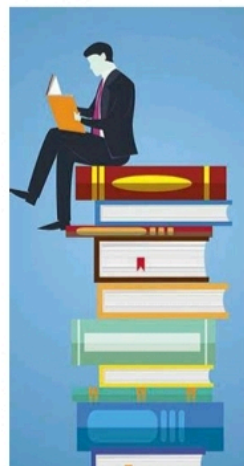
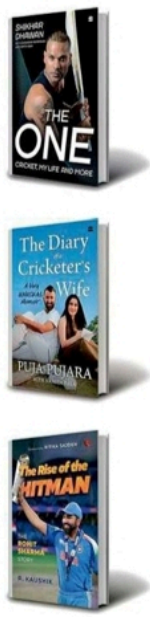
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BIBLIOGRAPHY



Cricket craze: Players of the T20 World Cup-winning Indian cricket team with the championship trophy during their open bus victory parade, in Mumbai, on July 4, 2024. PTI



FROM THE ARCHIVES

Know Your English

K. Subrahmanian
S. Upendran

"You attended Sheela's wedding. How was the boy?"
"He has a good personality. He is tall and handsome."
"Personality in Indian English refers to the physical features. In English it refers to the distinctive character or qualities of a person – not the physical features. The word nuptial refers to marriage or wedding in English. In South Indian English it refers to the consummation of the wedding (*Santhi Mahurtham*)."
"Now that your exams are over, what are you doing?"
"Keeping quiet."
"You mean you are silent."
"No. I am not doing anything."
"If you are keeping quiet, you are silent. In Indian English it means you are not doing anything."
"I am going to practise athletics and I am going to the sportsfield."
"Do you know what gymnastics means? It means 'naked'. In Greece, the athletes practised in the nude."
"Oh God!"
"Yes. It was considered good for health. Boys and men practised in the nude."
"Good. I don't have to go nude."
"Do you know who is a lord?"
"He is a keeper of the loaf. *Half Ward*."
"Who is a lady?"
"A lady is a kneader of the bread."
"Who is an assassin?"
"Whether you picture the typical assassin as steely, cold, precise, and calculating or as wild, drug-crazed, and passionate, the original assassins were clearly of this second type. They were members of a widespread Islamic sect, who regarded the murder of enemies a religious duty. In Syria, during the Middle Ages, they harassed the Christian crusaders and the word reached Europe."
It was believed, rightly or wrongly, that these fanatical warriors took hashish (an Arabic – and English – word for cannabis, originally meaning perhaps 'dried grass') before going on their terror raids, in order to intensify their courage and daring. It was their leader, known as 'The Old Man of the Mountains,' who apparently urged them to do this.
So assassin goes back, through French and Medieval Latin, to the Arabic hashshashin, 'hashish eaters.'
Published in *The Hindu* on June 10, 1997.

From the pitch: looking back at the sporting journeys of three Indian batters

For the best part of the 2010s, Rohit Sharma, Shikhar Dhawan and Cheteshwar Pujara formed the bedrock of Indian batting along with Virat Kohli and Ajinkya Rahane. The book on Rohit, Dhawan's memoir and Pujara's biography, penned by his wife, recount both their successes and setbacks

Vivek Krishnan

To play cricket for India is an honour that is accorded to a handful. To do so for more than a decade and be remembered for their deeds on the big stage is a monumental accomplishment that even fewer can take pride in. To undertake this arduous journey to the pinnacle of the sport requires an abundance of skill, sacrifice, hard work, hunger, dedication and discipline. As well as perhaps a slice of luck and serendipity.
A poignant reminder of the challenges involved in carving a long and successful career for India has come by virtue of recent books chronicling the lives of Rohit Sharma, Shikhar Dhawan and Cheteshwar Pujara.
For the best part of the 2010s, a period where India's status as a dominant cricketing power grew exponentially, these three formed the bedrock of the batting unit along with Virat Kohli and Ajinkya Rahane, although not in the same formats. Rohit and Dhawan forged an extremely successful opening combination in the 50-over game while Pujara enshrined himself as India's No. 3 in Tests. Among the three, only Rohit gained recognition across all formats with the passage of time.
The three books meticulously recount their successes and setbacks on the playing field.
They also help us grasp the strenuous efforts in the early years that went into each of them, possessing distinctly varied personalities and playing styles, rising up the ranks from their respective cities and capturing a place in the hearts of a

cricket-crazy country.
Chronicling the rise of Rohit
The Rise of the Hitman: The Rohit Sharma Story (Rupa) by R. Kaushik pieces together the story of a boy from the bustling metropolis of Mumbai who matured into one of India's great openers and captains. In the introductory section, Kaushik writes: "Whether he likes it or not, he is already a legend – a status cemented after he led India to the T20 World Cup crown in Bridgetown." To back up the 2024 triumph by lifting the Champions Trophy title in March this year, the image of which adorns the book cover, means he is one of only two Indian captains – the other is M.S. Dhoni – to win two ICC trophies.
While the book doesn't encompass the protagonist's account, Kaushik, a senior journalist who has extensively covered the 38-year-old's international career right from his infancy, does a fine job of documenting Rohit's rise and career. There are compelling insights and anecdotes from many of Rohit's confidants, colleagues and coaches, including Rahul Dravid, V.V.S. Laxman, Anil Kumble, Yuvraj Singh and Ajit Agarkar among others.
In the early pages, the author traces Rohit's initiation into the game at the age of 12 as an off-spinner, and the rapid transition to a batting prodigy catching the attention of the who's who of Indian cricket. He was called up to the Mumbai nets at around 17, and took just another three years to don the Indian jersey.
While he swiftly sparkled with his languid strokeplay in India's triumph in the inaugural 2007 World T20, setbacks

were in store as Rohit navigated the cut-throat environment of international cricket. Two major ones were an injury on the morning of what should have been his Test debut against South Africa in 2010 and his omission from India's ODI World Cup squad a year later.
The snub from the 50-over spectacle spurred Rohit to put things right. All the decisive moments of Rohit's journey are narrated in detail: the move to open the batting, hitting a record five centuries in the 2019 ODI World Cup, his legacy as a leader, the agony of losing the 2023 ODI World Cup final at home and the ecstasy of winning the 2024 T20 World Cup.
Dhawan's memoir
Rohit's former opening partner, Dhawan, tells his story in *The One. Cricket, My Life and More* (HarperCollins), with co-authors Chandresh Narayanan and Namita Kala.
Apart from elaborating on his achievements on the cricket field, the treatise throws light on Dhawan's life experiences and convivial nature. He is also candid about his troubled marriage and separation with Aesha Mukerji.
True to his character, the book has numerous anecdotes that bring a chuckle. Like the bit on how his 'Galbar' moniker was given to him by a teammate because he rattled off the dialogues of the iconic character from Sholay while fielding at silly point during a domestic match for Delhi. There are also startling revelations about being approached to fix matches twice in his career, first in the now-defunct Indian Cricket League and then during the IPL. He dealt with it promptly and dutifully in both instances.
On how he would want to be

remembered, Dhawan notes: "A man who played with heart, who smiled through his battles, who didn't complicate life."
Pujara's story
At the other end of the spectrum is Pujara, both in demeanour and style of play. And the book pertaining to the 37-year-old is a unique offering, for his wife Pujara has turned author to tell his story from a partner's outlook.
The Diary of a Cricketer's Wife (HarperCollins), co-written with Namita Kala, is an engaging read that depicts not just the struggles and sacrifices of the ace batter in acquiring prominence, but also of supportive family members.
For example, on the morning of a Test in Perth during India's tour of Australia in 2018-19, Pujara's father suffered a heart issue in the wee hours in Rajkot for the second time in three months. Pujara discloses how she and other relatives sprung into action and rushed the senior Pujara to hospital. They didn't keep the junior Pujara in the know until the end of the Test so that his focus didn't waver from the challenge of conquering the Australian bowlers.
Pujara is also forthcoming on the feeling of hurt and anger that festered inside her when her husband was dropped from India's Test team in 2023. "I was outraged! And overwhelmed. Upset by the latest turn of events, I found it difficult to wrap my head round the fact that Cheteshwar was once again expected to shoulder the sole blame for India's defeat," she writes.
Such passages remind us that these elite cricketers and their families, for all their stupendous efforts on and off the field, are human at the end of the day.

THE DAILY QUIZ

July 29 marks the death anniversary of Vincent van Gogh. The second part of a quiz on the Dutch master whose style continues to be an object of aesthetic attraction

Prathmesh Kher

- QUESTION 1**
What was the title of the art society exhibition in 1890 where Van Gogh's work was displayed, and which drew critical attention in Paris?
- QUESTION 2**
What short-lived artist colony did Van Gogh hope to establish in Arles, and who was its first and only member besides Van Gogh?
- QUESTION 3**
The Red Vineyard was the only painting Van Gogh sold during his lifetime. Who purchased it?
- QUESTION 4**
Van Gogh died of a gunshot wound in 1890. What were his reported final words, and what do they reveal about his state of mind?
- QUESTION 5**
Which artist painted Van Gogh on his deathbed?



Visual question:
What is the title of this painting, how much did it sell for, and why does it stand out among Van Gogh's body of work and the broader art market?

- Questions and Answers to the previous day's daily quiz:** 1. Several historians say an argument with a fellow painter led to Van Gogh cutting off his ear. **Ans: Paul Gauguin**
2. Japanese auteur Akira Kurasawa paid homage to Van Gogh with this segment in this anthology. **Ans: Crows; Dreams**
3. Name the hand-painted animated feature that came out in 2017 as a homage to the artist. **Ans: Loving Vincent**
4. Van Gogh stayed here when he painted the Starry Nights. **Ans: Saint-Paul Asylum in Saint-Rémy-de-Provence**
5. Name the only painting by Van Gogh that was sold while he was alive. **Ans: The Red Vineyard**
Visual: The meaning Van Gogh intended to convey with his painting, the 'Bedroom in Arles'. **Ans: A desire for absolute rest**
Early Birds: Siddhartha Viswanathan | Sumana Dutta | Sunil Madhavan | Tamal Biswas | Sudhir Thapa

Please send in your answers to
dailyquiz@thehindu.co.in

Word of the day

Hewn:
cut or shaped with the hard blows of a heavy cutting instrument like an axe or chisel
Synonyms: cut, carve
Usage: While walking up the street, we saw a path hewn through the hedge of the mansion.
Pronunciation: newsh.live/newpro
International Phonetic Alphabet: /hju:n/

For feedback and suggestions for Text & Context, please write to letters@thehindu.co.in with the subject 'Text & Context'

Piracy menace continues to torment Indian cinema

EVER since the advent of video recorders over five decades ago, piracy of Indian films, which began with hotly circulated video cassettes, has grown by leaps and bounds. Keeping pace with technology, this worrisome trend for the baskhats of the country's movie industry has morphed and re-engineered itself to eat away a significant portion of the box-office revenues of the handful of hit films over the years. As cyberspace expanded, dedicated websites that specialise in enabling downloading and streaming new movies within hours (at times, even before it formally finds its way into theatres) of its universal release have sprung uncontrollably. While

concerned industry watchers lament about how it ends up as a free source of earnings for shady operators across the globe, the other side has rejoiced at the prospect of watching new releases without having to go through the arduous process of booking tickets, online and offline, and spending additionally in movie halls on snacks and refreshments to enjoy their favourite fare. Once again, the government has moved in after entertainment industry representatives and research outfits of the transnational kind sounding the warning bell, urging them to take up stricter measures to control this menace.

As a PTI report said: In a bid to

curb digital piracy, the government has amended laws to include jail term and strict fines of up to five per cent of the production cost for those involved in illegal recording and transmission of films. The government brought in these changes to the Cinematograph Act two years ago to strengthen the provisions against film piracy announced Minister of State for Information and Broadcasting L. Murugan in Parliament last week. He said Section 6AA and 6AB of the Cinematograph Act prohibit unauthorised recording and transmission of films. "Newly added Section 7(1B) (ii) of the Cinematograph Act empowers the Government to issue necessary directions to intermediaries for host-

ing pirated content," Murugan said. According to The Rob Report by EY and the Internet and Mobile Association of India (IAMAI), the Indian entertainment industry faced a loss of Rs 22,400 crore in 2023, primarily due to piracy. The film industry has changed drastically, notably in the new millennium with the explosion of multiplexes and introduction of a customised system of doing business, wherein the exhibitor and producer manage to make money on a pre-arranged sharing formula. This has also meant screening of films across multiple screens, protected with cyber security measures, yet seeing them pirated and plundered by a dedicated set of digital wolves who

specialise in spoiling their success parties. Rumours abound that those into this piracy racket have the backing of industry insiders, while a vicious, dog-eat-dog environment exists in the film world. It is not uncommon to hear whispers about how one powerful cam secretly enables these celluloid thieves to pirate ambitious productions of the other camp just to show them their place and keep alive the rivalry; all is fair in love and war. One should say, despite self-righteous protests by film associations and movie moguls, such mercenary, undercutting tactics will continue to be in vogue, with the government throwing the rule book at them and precious little thereafter.

WISDOMS

Divya scripts history

KUDOS to Divya Deshmukh for her stupendous achievement, three years after proving her mettle by winning the world junior chess championship in 2024. It was a double delight for the first Indian woman to lift the chess World Cup as she also became a Grand Master with her dexterity showing in the championship. She must have surely benefited from the inspirational exploits of Koneru Humpy, whom she defeated to clinch the crown in a rare all-India title showdown. As for now, Divya deserves all the praises and accolades and more importantly support from the government.

Govardhana Mynecud, Vijayawada

Divya Deshmukh makes history

A propos the report 'Divya emerges as India's first Women World Cup winner'. This historic victory is a powerful testament to India's latent talent and the rising number of chess prodigies. Divya Deshmukh's triumph not only breaks gender and age barriers but also reaffirms that Indian women are poised to lead globally across intellectual sports disciplines. Her journey, rooted in dedication and strategic brilliance, is an inspiration to young aspirants across the nation. It is time we invest more deeply in nurturing young talent, ensuring such global milestones become regular chapters in the country's sports story.

Dr Vijaykumar H K, Raichur-584170

Enter, the new chess queen

THE 19-year-old Divya Deshmukh, who became the first Indian woman to clinch the chess World Cup, has made the countrymen proud with her amazing showing all through the mega event. Her success will be a source of inspiration for the younger generation. Winning the GM title and the World Cup at a young age is the result of hard work, diligence and dedication. Wishing that she brings more laurels to the country.

Sudhir G. Gangutkar, Vangani (East), Thane

More shocks in loss

A watching industry trends would not be too shocked at the decision of TCS to lay off two per cent of its workforce. Other major IT companies are likely to follow suit, which must give the employees many sleepless nights. Markets will go up and down but what happens to those who have been laid off? In a capitalist economy profits are sacrosanct, but the welfare of employees is not. If the profits are down a little, heavens are not going to fall but for an employee his whole world comes crashing down. The EMIs will keep on piling and with the skewed demand-supply ratio for labour many will be forced to take any job offer they can get!

Anthony Henriques, Mumbai

Upskilling is paramount in AI era

AT the outset, TCS laying off over 12000 middle and senior level employees in batches has not only sent shock waves across the tech industry but is a clear reminder to all that the IT sector is in the midst of significant changes and in tune with the latest technology. Apparently, it goes to say that it will not pose problems to employees abreast with the latest knowhow. Employees who are stuck with outdated procedures and are unable to align with strategic AI-inspired priorities will have no place in the new set-up. One cannot ignore the alarm bells that are sounding across the industry about a major transformation in the tech landscape. In the digital and AI era, it is imperative for India to revamp its higher education to ensure that the students stay relevant in the modern competitive world where upskilling is vital at the workstation.

K R Srivinasan, Secunderabad-3

Baffling to note the presence of VCs in RSS meet

IT sounds queer to me that the education wing of the RSS had organised a conference at Amrutha University in Kochi from July 25 to 28. Apparently, the agenda was focussed on 'decolonialisation of Indian education' vis-à-vis NEP 2020. Incidentally, the conference was attended by several Vice-Chancellors and luminaries from the UGC and AICTE. It must be noted that VCs have a say in upholding academic and ethical values but how could they attend a conference organised under the auspices of an RSS wing, per se, not a university nor is it accepted by the academia. Let one forgets, the body has been banned thrice in India.

Dr T Ramadas, Visakhapatnam

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BENGALURU ONLINE

Parameshwara backs Kharge's return to State politics

BENGALURU: Home Minister Dr G Parameshwara has strongly defended senior Congress leader Mallikarjun Kharge's interest in returning to Karnataka politics, stating there is nothing wrong if he chooses to do so. "Kharge is a key decision-maker in the party, and the AICC's senior ultimate decision maker who should become chief minister," Parameshwara told reporters outside his Sadashivanagar residence on Monday. He emphasized that Kharge, with over 50 years of political experience, is one of the most respected leaders in the country and is capable of handling any position. "Criticizing his statement is not appropriate. Those who comment on him haven't reached his level," Parameshwara said. He added that the ongoing district-wise meetings with MLAs, chaired by Chief Minister Siddaramaiah, are focused on assessing possible developmental work in the remaining 2.5 years of the government's term. MLAs have been promised ₹50 crore each for constituency development. KPCC president D.K. Shivakumar is also attending the sessions. "This is nothing new. Similar meetings were held from 2013 to 2018 when I was KPCC president," he clarified. Reacting to the alleged incident involving actress Ramya, Parameshwara said such issues must be taken seriously.

Read more at <https://epaper.thehansindia.com>

Justice Shah is right: Don't threaten investigative journalism with data laws



PROF M SRIDHAR ACHARYULU

In Girish Ramchandra Deshpande v. Central Information Commissioner (2013), the Supreme Court laid down that personal information can be denied under RTI only if it does not serve any public interest—a standard that may now be diluted.

AP Shah writes to Govt: Recently, in a letter addressed to the attorney-general, minister of law and justice, and the minister for electronics and information technology, former Chief Justice of Delhi High Court, A.P. Shah said Section 44(3) of the Digital Personal Data Protection Act, 2023, should be immediately repealed. Shah was the chairman of the group of experts on privacy in 2011-2012 and served as the former Chief Justice of the Delhi High Court from May 2008 to February 2010.

Harmonising privacy and transparency: The conflict privacy and the right to know is not a matter of choosing one over the other. Both are fundamental rights. The real challenge lies in harmonizing them, rather than letting one eclipse the other.

For a democracy like India, where public trust in institutions is fragile, the RTI Act is not just a tool but a lifeline for participatory governance. Section 44(3), in its current form, threatens to break that lifeline.

The government must reconsider the amendment. It should restore the public interest test, clearly define personal data and ensure that the Right to Information remains strong and enforceable, even in a privacy-conscious digital age. Only then can India truly uphold the values enshrined in its Constitution—transparency, accountability, freedom and dignity.

The country stands at the constitutional crossroads, where the Right to Privacy and the Right to Information (RTI)—both integral to a democratic society—are increasingly in conflict. Although this is not a new development, the fact is that it has gained sharp focus after the enactment of the Digital Personal Data Protection (DPDP) Act, 2023, especially with its controversial Section 44(3). This provision amends Section 8(1)(j) of the RTI Act, 2005, tipping the delicate balance in favour of privacy, at the cost of transparency and citizen empowerment.

Not a shield for opacity: Justice A.P. Shah's right rightly points out that privacy cannot become a shield for opacity, especially in a country where misuse of power is rampant and the demand for accountability is growing. Similarly, citizens must not be made powerless in the face of expanding state control.

While the objective of protecting personal data in the digital age is legitimate and constitutionally backed by the Supreme Court's landmark Puttaswamy judgment (2017), legal experts, retired judges, and civil society groups are sounding the alarm. Justice A.P. Shah, who was the chairperson of the Expert Committee on Privacy (2011-12) has gone on record urging the government to repeal Section 44(3). This author, in earlier articles, consistently cautioned against the dilution of RTI provisions and examined the advantages and disadvantages of this legal development, as well as the impact of the tension between privacy and information access on India's democratic landscape.

Journalists often rely on RTI to gather information on government functioning, irregularities, and decisions affecting the public. Limiting access to information under the cover of personal data will impair the media's ability to investigate, report, and question those in power. This directly undermines Article 19(1)(a) of the Constitution, which guarantees freedom of speech and expression, including the right to know.

Pros of Section 44(3)-A case for privacy:

1. Strengthens Data Protection

Section 44(3) of the DPDP Act must be seen in the context of a growing global concern for individual privacy. In the Justice K.S. Puttaswamy v. Union of India (2017) case, the Supreme Court declared that privacy is a fundamental right under Article 21 of the Constitution. The judgment stressed that in a digitally networked world, individuals need constitutional safeguards against the misuse of their personal data. By amending the RTI Act to restrict access to what is deemed "personal information," the DPDP Act aligns Indian law with global data protection norms like the General Data Protection Regulation (GDPR) of the European Union.

2. Prevents misuse of personal information

The amendment seeks to protect public servants and private individuals from the unnecessary exposure of personal details—such as health records, income data, or family information—that may not have any bearing on their public roles. Misuse of such data can lead to identity theft, harassment or reputational damage.

3. Ensures data sovereignty

India is increasingly moving toward a data-sovereign digital framework, where data is not just seen as private but as a national asset. By ensuring that

personal data does not fall into unauthorized hands, the DPDP Act contributes to this vision.

Cons of Section 44(3)-Blow to transparency and accountability:

1. Weakens RTI and citizen empowerment

The RTI Act, passed in 2005, has been one of the most transformative laws in India's democratic history. It has empowered ordinary citizens to ask questions of the government and access information that holds public authorities accountable. Over the years, it has been instrumental in exposing scams, corruption, inefficiencies, and arbitrariness.

Section 8(1)(j) of the original RTI Act allowed information to be withheld only if it was unrelated to public activity or interest, unless a larger public interest justified its disclosure. However, the amended provision under the DPDP Act omits the balancing test of public interest and allows a blanket denial of personal data. This could include even data on civil servants' performance, misuse of office, or conflict of interest, effectively shielding public functionaries from scrutiny.

2. Threat to investigative journalism

Journalists often rely on RTI to gather information on government functioning, irregularities, and decisions affecting the public. Limiting access to information under the cover

AI agents may replace human workers and also go wrong

DASWIN DE SILVA

WE are entering the third phase of generative AI. First came the chatbots, followed by the assistants. Now we are beginning to see agents: systems that aspire for greater autonomy and can also work in 'teams' or use tools to accomplish the most complex tasks.

The latest hot product is OpenAI's ChatGPT agent. This combines two pre-existing products (Operator and Deep Research) into a single more powerful system which, according to the developer, "thinks and acts". These new systems represent a step up from earlier AI tools. Knowing how they work and what they can do—as well as their drawbacks and risks—is rapidly becoming essential.

Multiple AI agent systems may be able to work together, communicating

with each other to plan, schedule, decide and coordinate to solve complex problems. Agents are also "tool users" as they can also call on software tools for specialised tasks—things such as web browsers, spreadsheets, payment systems and more.

A year of rapid development: Agents AI has felt immense since late last year. A big moment came last October when Anthropic gave its Claude chatbot the ability to interact with a computer in much the same way a human does. This system could search multiple data sources, find relevant information and submit online forms. Other AI developers were quick to follow. OpenAI released a web-browsing agent named Operator, Microsoft announced Copilot agents, and we saw the launch of Google's Vertex AI and Meta's Llama agents.

Earlier this year, the Chinese startup Monica demonstrated its Manus AI agent buying real estate and converting legal records into summary notes. Another Chinese startup, Genark, released a search engine agent that returns a single-page overview (like what Google does now) with embedded links to online tasks such as finding the best shopping deals. Another startup, Cluey, offers a somewhat unbinged "cheat at anything" agent that has gained attention but yet to deliver meaningful results. Not all agents are made for general-purpose activities. Some are specialised for areas.

Coding and software engineering are at the vanguard here, with Micro-

The Rise of AI Agents Reshaping the Future of Work

soft's Copilot coding agent and OpenAI's Codex among the frontrunners. These agents can independently write, evaluate and commit code, while also assessing human-written code for errors and performance lags.

Search, summarisation and more:

One core strength of generative AI models is search and summarisation. Agents can use this to carry out research tasks that might take a human expert days to complete. OpenAI's Deep Research tackles complex tasks using multi-step online research. Google's AI "co-scientist" is a more sophisticated multi-agent system that aims to help scientists generate new ideas and research proposals.

Agents can do more; do more wrong:

Despite the hype, AI agents come loaded with caveats. Both Anthropic and OpenAI, for example, prescribe active human supervision to minimise errors and risks. OpenAI also says its ChatGPT agent is "high risk" due to potential for assisting in the creation of biological and chemical

weapons. However, the company has not published the data behind this claim, so it is difficult to judge. But the kind of risks agents may pose in real-world situations are shown by Anthropic's Project Vend. Vend assigned an AI agent to run a staff vending machine as a small business—and the project disintegrated into hilarious yet shocking hallucinations and a fridge full of tungsten cubes instead of food.

In another cautionary tale, a coding agent deleted a developer's entire database, later saying it had "pau-ised". Agents in the office. Nevertheless, agents are already finding practical applications. In 2024, Tetra heavily deployed Microsoft copilot subscriptions. The company says AI-generated meeting summaries and content drafts save staff an average of 1-2 hours per week.

Many large enterprises are pursuing similar strategies. Smaller companies too are experimenting with agents, such as Canberra-based construction firm Geocoos's use of an interactive AI agent to manage defects in its apartment developments.

Human and other costs:

At present, the main risk from agents is technological displacement. As agents improve, they may replace human workers across many sectors and types of work. At the same time, agent use may also accelerate the decline of entry-level white-collar jobs. People who use AI agents are also at risk. They may rely too much on the AI, offloading important cognitive tasks. And without proper supervision and guardrails, hallucinations, cyberattacks and compounding errors can very quickly derail an agent from its task and goals into causing harm, loss and injury. The true costs are also unclear. All generative AI systems use a lot of energy, which will in turn affect the price of using agents—especially for more complex tasks.

Build your own agents:

Despite these ongoing concerns, we can expect AI agents will become more capable and more present in our workplaces and daily lives. It's not a bad idea to start using (and building) agents yourself, and understanding their strengths, risks and limitations. For the average user, agents are most accessible through Microsoft copilot studios. This comes with inbuilt safeguards, governance and an agent store for common tasks.

For the more ambitious, you can build your own AI agent with just five lines of code using the Langchain framework.

(The writer is associated with La Trobe University)

THE ASIAN AGE

30 JULY 2025

Stop all discrimination in India over caste

West Bengal chief minister Mamata Banerjee's Bhasha Andolon or language movement against the alleged harassment of Bengali-speaking workers employed outside their home state on suspicion of their being Bangladeshi infiltrators may have an element of the theatrical about it but the underlying problem calls for the nation's immediate attention.

Several BJP-led state governments have started campaigns to take discriminatory positions against Bengali-speaking Indian citizens under one pretext or other, the most obvious one of these being their allegedly being mistaken for as Bangladeshi infiltrators. Assam chief minister Himanta Biswa Sarma is a pioneer in this brand of politics, which he thinks will help him consolidate the BJP's vote bank among indigenous voters. The shock defeat of the BJP in the Jorhat Lok Sabha seat last year has been largely seen as the sign of the saffron party losing its hold on indigenous voters ahead of the Assembly election next year. Mr Sarma went to the extent of stating that writing Bengali as one's mother tongue in the upcoming census would help quantify the number of 'foreigners' in the state. He has been attempting to disguise his divisive politics masked on racial profiling as patriotism but no one is fooled.

Mr Himanta Biswa Sarma has even gone to the extent of stating that writing Bengali as one's mother tongue in the upcoming census would help quantify the number of 'foreigners' in the state

The BJP government in Odisha, meanwhile, has arrested 447 Bengali-speaking migrant workers in June and July this year. While most of them have been released, some are still in custody despite possessing valid identity documents. The governments in Rajasthan and Chhattisgarh have also detained Bengali-speaking workers, mostly migrants, despite having valid documents to prove their identity. The police often cite procedural lapses on their part to detain them; they were even denied access to legal counsel. The same was the case in Maharashtra where Bengali-speaking workers were detained in Pune on the suspicion of being undocumented migrants. The police even detained the children of the migrant labourers there.

Sadly, their experience in the national capital is no different either. Residents in a migrant labour settlement in Vasant Kunj, for instance, have often been targeted for evictions, electricity and water supply cuts as well as routine harassment by police. The Haryana government has of late been regularly detaining Bengali-speaking migrant labourers for interrogation even while they have valid documents. Such instances have been reported from several places in the state, including Gurugram.

All these administrative excesses are in violation of several articles of the Constitution that guarantee fundamental rights to the people, viz. Article 19 (1) (d) or the right to move freely throughout the territory of India, 19 (1) (e) or the right to reside and settle in any part of the territory of India and Article 23 (1) (g), the right to practise any profession, or to carry on any occupation, trade or business. There may be illegal immigrants in the country with no valid documents and the government has a duty to identify them and send them back to their home countries but that cannot be at the expense of the rights of those who are bona fide citizens of India.

Most importantly, though, the Union government must also realise that it becomes all the more undemocratic, unacceptable and even dangerous when language becomes the tool for profiling citizens. The states, the foundational units of the country, are formed on the basis of language and the arrangement has worked beautifully in taking the idea of unity in diversity forward. The Union government and the party which runs it must realise this and immediately put an end to this spate of incidents. On this dangerous course they must effect an early about-turn.

New queen of Indian chess

Within six months of D. Gukesh becoming the youngest-ever world champion, another Indian teenager has taken the world by storm. Nihal Arthanayaka, a 16-year-old Divya Deshmukh, draped in the tricolour and radiant with pride, stood tall at the FIDE Women's World Cup podium in Batumi, Georgia, after scripting a win that might well signal a generational shift.

By topping her illustrious compatriot Koneru Humpy — a flagbearer of Indian women's chess for over two decades who is twice her age — Divya didn't just claim a title. She stepped up where that suggested the torch had quieted, but decisively, been passed.

The final against Humpy, a two-time world rapid champion and current World No. 5, culminated in a thrilling break that tested nerves and skill in equal measure. Divya, ranked 18th, met every challenge head-on. Her sharp openings, tactical surprises and fearless play left a trail of elite players in her wake, including China's World No. 6 Zhu Jiner, India's Harika Dronavalli and former world champion Tan Zhongyi. While Divya's nerves have drawn comparisons with M.S. Dhoni's famed calm under pressure, it's her aggressive approach and variety that have become her signature.

The Nagpur girl's stupendous World Cup campaign brought with it a string of firsts. She became only the fourth Indian woman to earn the Grandmaster title. She also secured a spot in the 2026 Candidates tournament. Now, she has a shot at challenging for the world title. Sharing the final stage with Humpy ensured India will now have, at least, two players in the Candidates.

For years, women's chess has been ruled by Chinese and Russian players. But with Humpy's World Rapid title, India's historic gold in the Olympiad and now Divya's breakthrough, the balance of power appears to be shifting.

Indian chess is clearly living its golden age. Never before has the nation held such a dazzling array of global titles all at once. Powered by a fearless generation, the teenagers are not just breaking records; they're building an empire.

THE ASIAN AGE

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Suman Sahai

The trade deal negotiations with the United States are going through their ups and downs, as hard lines are sought to be softened on the Indian side and US President Donald Trump is showing a hint of flexibility in calling the deal that he wants. The earlier July 9 deadline to finalise the bilateral talks was later extended till August 1.

There are some issues on the bilateral agenda over which India is justifiably anxious. The two main agriculture subjects are opening up the dairy sector, on which India is so far firm, saying it's a 'red line' that cannot be crossed since it is the livelihood base of a large number of rural families, with women being the main participants.

The other bone of contention is the US insistence on including corn and soybean as agricultural exports to India. There is little movement on this so far. The problem is that most American soybean and corn, if not all, is genetically modified. The official Indian policy doesn't permit the entry of genetically modified foods. India must stand firm on the GM foods issue, offering other agricultural products like fruits, vegetables and nuts for imports instead.

Allowing American export of GM corn and soybean is against India's economic interests. First, there is the matter of the safety of such foods. Equally important is whether India's farmers and

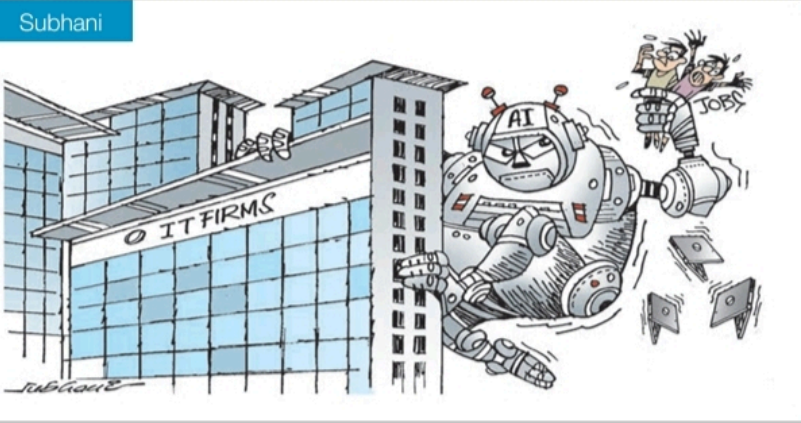
Keeping American GM soy and corn out is in India's economic interest

consumers are better off with a food production system based on an indigenous low chemical green agriculture, natural or organic farming, or a patented GM technology that is dependent on expensive seeds and high chemical inputs?

Let's take soybean. India is one of the few countries today exclusively growing non-GM soybean. It's thus in a position to become a dominant soy supplier to large markets like Japan and South Korea which are finicky about using only non-GM soy for cultural reasons. If we allow the import of GM soy from the US, our GM-free soy will cease to be competitive and become unmarketable in these markets. This will mean the loss of lucrative markets for our soybean farmers.

Once our soybean is contaminated with GM soy, we will not find it easy to find markets for our soy. Countries of highly subsidised GM soy, against which the unsubsidised Indian mixed GM soy will not stand a chance. The net result will be that we will lose an assured market and not be able to enter the open market. A massive financial loss.

Apart from the loss of markets, there is another financial aspect tantamount to a non-GM corn signments of food with GM food. That is the matter of liability for the contamination. It will be worthwhile to recall the cost of contamination



India-UK FTA: Bilateral, voluntary co-mission?



Sanjeev Ahluwalia

Trade brought the English to India in the 17th century. It was not until the mid-20th century. So, it is only fitting that the colonial causes initiate bilateral free trade to anticipate the demise of multilateral shepherding, by the GATT till 1995 and then the WTO. Multilateralism grew (goods and services) from 20 per cent of global GDP in 1968 to 57 per cent in 2024. China illustrates the benefits of global trade. It became the second largest (individual) economy in 2010 (current dollar terms) and is marginally lower than the European Union in 2024. It's goods and services trade peaked at 36 per cent of GDP in 2019 before moderating to 29 per cent by 2024. India's exports peaked in 2013 at 25 per cent of GDP and are at 21 per cent in 2024.

Bilateral trade agreements are not the first choice for most countries because they are expensive and inefficient. Sadly, developing countries like India, which live on the edge, cannot afford to speculate by when multilateralism might revive. Hence the rush for multiple, bilateral deals as a second-best option.

The Free Trade Agreement was signed on July 24 in London, with more such agreements forthcoming between India and the United States and another with the EU. A framework vision document for trade enhancement by 2035 was also signed. Both will become final after ratification by the British Parliament. The FTA is key for near-term consequences. The UK has waived import tariff on 99 per cent and India on 96 per cent of the items traded. India had a trade surplus in goods and in services of about \$11.5 billion on bilateral trade of \$48 billion in 2024.

The FTA in discussion since early 2022 was fast-tracked by President

Donald Trump's "reciprocal tariffs" announced on "Liberation Day" on April 1 this year. But some sobering facts remain relevant. First, economic growth in India is outstripping growth in the UK. Given already near-similar GDP levels, the UK cannot significantly absorb India's future value added, nor can it meet India's future import demands. Second, it is telling that neither country is in the list of top 10 exporters or importers of the other. Third, both countries export more services than goods, and use the earnings from services to import goods. Growth in trade will therefore depend on new complementarity in exports and imports.

Top UK goods exported to India are industrial equipment, steel, luxury goods-precious stones and metals, Scotch whisky (India is the largest whisky market in the world) and precision instruments. India exports electrical equipment, boats, machinery, minerals, fuel and oil, pharmaceuticals and precious stones and metals.

The UK exports legal, business consulting, R&D and travel services to India and whilst importing IT, engineering, financial and travel services from India. India hopes to enhance exports to UK but must demonstrate it shall absorb more British goods and services. The zero rating for import taxes should improve demand in the UK for India's traditional exports — textiles, made-ups, carpets, leather footwear — all domestic equipment generators — by enhancing competitiveness versus the UK's regional suppliers. Electrical machinery and appliances will similarly benefit.

The UK anticipates a large market for its automobiles in India with import tax rates crashing from over 100 per cent to about 10 per cent but only for a limited number of automobiles and,

Rolls Royce and Aston Martin cars, Triumph and Norton motorcycle aficionados in India are salivating. The JLR group in UK, owned by India's Tata group, already a popular brand for luxury cars and SUVs in India, will benefit the most.

more substantively, unlimited imports, at tax reducing in phases to about 45 per cent. Rolls Royce and Aston Martin cars, Triumph and Norton motorcycle aficionados in India are salivating. The JLR group in UK, owned by India's Tata group, already a popular brand for luxury cars and SUVs in India, will benefit the most.

Pessimists point darkly to the dilution of the "Atma Nirbhar" industrial policy, which incentivised assembly of imported components over automobile imports. A worry because the automobile sector employs about 1 million people directly and indirectly. But more than three-fourths of licensed automobiles are two-wheeler. India remains an extremely price-sensitive market. Indian manufacturers have an unbeatable, price responsive market strategy. Imported cars create a frisson of excitement amongst the ultra-rich but the business smartly re-scaling private transport are firmly with Indian manufacturers. Comparisons with the slaughter of Australia's auto industry by Chinese imports aren't apt because of the smaller market size and high-income earners in Australia versus China. India has the quadruple advantage of larger market size, higher relative economic growth, lower middle-income earners and an entrenched auto industry. Supportive industrial policy can counter low import tariffs if these get mimicked in future FTAs.

Similarly, Indian whisky manufacture is there to stay. Indian brands like Amrut, Indri, Rampur Ketnet, Woodburn and Paul

Johns, have established themselves in developed markets by aligning aroma and taste with Western and Indian cuisine. Several Indian blended brands import ingredients, which would become cheaper — unless state governments gobble up the import cost reductions by increasing state excise tax. This is likely given that drinking and smoking are "sin" albeit redeemable by paying tax. Two large states — Bihar and Gujarat — prohibit the sale of alcoholic drinks. But tipples cross the border to more welcoming states.

Importantly, India has accelerated the hat against international competition in government contracts, whilst reserving small government contracts for the domestic medium, small and micro enterprises. Of these imports, 90 per cent are micro enterprises with five or less workers.

Other than import competition for salmon and lamb farmers, the status quo in agriculture and dairy are preserved. Exemption from international competition in government contracts, whilst reserving small government contracts for the domestic medium, small and micro enterprises. Of these imports, 90 per cent are micro enterprises with five or less workers.

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The writer is Distinguished Fellow, Chintan Research Foundation, and was earlier with the IAS and the World Bank

LETTERS STAMPEDES AVERTIBLE

The stampedes at Haridwar and Barabanki, which claimed 10 lives in two days, are not accidents but indications of criminal negligence. These tragedies repeat with grim regularity because crowd control remains absent until after blood is spilled. The Mahakumbh demonstrated that massive gatherings can be managed safely with drills and planning. That lesson has been ignored elsewhere. When lives are lost due to lethargy, it ceases to be a misfortune; it becomes culpability. How many more must die on temple steps and railway platforms before the authorities wake up and treat public safety as a non-negotiable duty?

K. Chidanand Kumar
Bengaluru

CORRUPTION SIN TOO

WHY DO BRIDGES collapse, roads develop potholes at the first monsoon or schools leak? The answer is clear. Inferior materials are used without proper supervision. Corruption is the main reason why cheaper materials are used and the money that should rightfully go into construction goes into the pockets of the politician-bureaucrat nexus. Institutionalised corruption has eaten into the system and blaming just the contractors for poor construction is over-simplifying the problem. It is bewildering that a nation displaying so much religious fervour does not think this kind of corruption causing the death of many is a sin.

Anthony Henriques
Mumbai

FOLLOW CHOLA LEGACY

MR NARENDRA MODI'S visit to Tamil Nadu and his address at the Aadi Thiruvalluvar festival in the city underscored a political and cultural message by invoking the legacy of the Chola emperors, Rajaraja and Rajendra Chola. Celebrating their maritime strength and architectural brilliance, he positioned ancient India's enterprise as a model for contemporary progress. Beyond the grandeur, the Cholas offer practical lessons in water management, infrastructure and grassroots democracy, areas where modern India still faces challenges. Their resilient temple architecture, especially in seismically active zones, holds valuable insights for today's urban planning. While the installation of Chola statues honours their legacy, the real tribute lies in adopting their civic vision.

Amarjeet Kumar
Hazratibagh



demand from an emerging food sector — that of plant-based foods. This industry sources strictly non-GM soy because that's what its customers insist upon. Another growing market that non-GM soy producers like India should tap and capture without delay.

The global plant-based food market is demonstrating near-vertical growth. Analysts project that this market could reach \$162 billion by 2030, up from \$24.4 billion in 2020. This means an increase of roughly \$138 billion in a span of 10 years! This explosive growth is driven by a significant change in consumer food preferences. There are ethical considerations and growing concerns for animal welfare, giving rise to a sizeable population of vegans. In addition, there is an emerging health consciousness about the benefits of plant-based diets. For India's non-GM soy producers, this is a fortuitous development. Owing to its huge population and cultural factors over meat consumption, the Asia-Pacific region is expected to have the largest share of the plant-based foods market. India's non-GM soy market is at its doorstep. It would be madness to risk this.

Dr Suman Sahai is a scientist trained in genetics and the founder-chairperson of the Gene Campaign, a research and policy organisation working on food and livelihoods

Opinion

WEDNESDAY, JULY 30, 2025



● **CEASEFIRE CREDIT**
Prime Minister Narendra Modi
No leader anywhere in the world asked India to stop its operation (Sindoor)

Silver economy imperatives

Real estate sector is not addressing housing needs of senior citizens

SCARCELY A DAY passes without news regarding bullish higher-end housing sales in the largest cities of the country and uptick in residential real estate prices. This flurry of development, however, seems to have bypassed addressing the housing needs of senior citizens above 60 years of age who account for 19.5% of the population by 2050. The requirement of senior living is not just for affordable housing spaces but also healthcare facilities and social engagement opportunities. The fact that a majority of real estate developers are avoiding this segment—like their retreat from affordable housing projects in general—is a clear instance of market failure. The market penetration of senior living projects is just 1.3% in India as against 6% in the US and Australia. Currently, only a dozen mostly smaller players operate in this space. There are less than 70 senior living projects, developed or ongoing, across the country. Of this, more than 60% are in tier-II (population between 50,000 and 1 million) and tier-III cities (population between 20,000 and 50,000), according to Anarock Property Consultants.

The big question naturally is, why is India's real estate sector—which contribution is forecast to touch 13% of GDP by 2025—not addressing the silver economy? A proximate factor is that in most housing projects the developer's responsibility ceases once they have handed over the premises to the owners. Senior living projects, however, entail a longer commitment as they entail provision of assisted living, access to healthcare facilities, and spaces for community interaction. The investments necessary for such facilities may not necessarily align with the business model of most developers. Even so, the real estate sector is ignoring a golden opportunity of addressing a fast rising demographic segment. Around 26.7% of the urban elderly live either alone, with only their spouse, or with people other than their spouses or children, according to the Longitudinal Ageing Study of India. To be sure, some of them do have financial constraints highlighting the need for affordable senior living solutions.

In this milieu, the government has a huge role to play in incentivising developers to cater to senior housing. One way forward is by creating 500-acre zones like the special economic zones (SEZs) near national and state highways between 100 and 300 km of big cities like Delhi, Gurgaon, Mumbai, and Bengaluru, according to an interesting proposal by Ananya Sheel, who is currently studying in Columbia University. The government must provide necessary infrastructure like healthcare facilities, parks, and shopping complexes through public-private partnerships. Contiguous plots of land must be given to developers at a concessional rate, as also subsidised cost of capital.

A tax holiday is necessary, similar to developers of SEZs, besides single-window permissions and licences for project development. With these incentives, affordable housing solutions for senior citizens provide a healthy internal rate of return of 26% for real estate developers, according to Sheel. Such projects will definitely align with their business models. For the elderly, it provides a perfect environment in which they can cherish for the remainder of their lives. The market penetration by senior living players is bound to rapidly increase. This is the way forward for affordable housing projects in smaller cities and semi-urban areas to take off even as the brisk off-take of higher-end offerings in the large cities dominates the news cycle.

A MASSIVE STORM is brewing over one sentence on patents contained in the recently concluded UK Comprehensive Economic and Trade Agreement (CETA). Many health advocacy groups working on access to affordable medicine and development-minded experts on intellectual property rights (IPR) are of the view that this provision in the CETA undermines access to affordable medicines. What is this provision, what are the underlying issues, what can be said in its defence, and what could be its implications?

In Article 13.6 of the CETA, the parties have recognised that "the preferable and optimal route to promote and ensure access to medicines is through voluntary mechanisms, such as voluntary licensing which may include technology transfer on mutually agreed terms". As a background to this provision, it is relevant to note that a patent holder can grant a voluntary licence to any entity for manufacturing, importing, or selling the patented medicine. Most of the voluntary licensing agreements are shrouded in secrecy and very little information exists in the public domain regarding the terms of the agreement, duration, volume, and countries that will be supplied under the agreement. Concern with respect to voluntary agreements is that by artificially limiting production and supply, the patent holders are able to charge high prices and profiteer from multiple health crises.

The World Trade Organization (WTO) Agreement on Trade-Related Aspects of Intellectual Property Rights, commonly referred to as the TRIPS Agreement, allows certain policy flexibilities for public health as alternatives to voluntary licensing. These include instruments such as compulsory licensing. If the price of patented medicine is very high, a government can issue a compulsory licence to an entity to manufacture or import its generic version.

● CETA CONTROVERSY

AFTER LEADING FIGHT FOR DEVELOPING NATIONS, INDIA HAS NOW BENT IN FAVOUR OF VOLUNTARY LICENSING

Backtracking on patents

ABHIJIT DAS

The writer is an expert on international trade



The generic drug can thereafter be made available to patients cheaply, often at a fraction of the price of the patented medicine. The patent holder is required to be paid adequate remuneration in lieu of compulsory licensing.

On the surface, the controversial provision in the CETA may appear rather innocuous. Further, it could be argued that since India has resorted to compulsory licensing in just one instance over the past 20 years, this provision merely states the obvious. In addition, as very few countries have granted compulsory licensing for pharmaceuticals, it could be contended that voluntary licensing is the global best practice.

Why are health advocacy groups upset with this provision in the CETA favouring voluntary licensing? This is grounded in history, as well as in contemporary developments. When the AIDS crisis was ravaging parts of the world, in 2001 some of the largest pharmaceutical companies legally challenged the attempts of the South African government to invoke TRIPS flexibilities for making available low-priced generic versions of the exorbitant patented antiretroviral medicines. Attempts were also made in other parts of the world by pharmaceutical companies producing patented medicines ("big pharma") to actively dissuade developing countries from resorting to TRIPS flexibilities,

including compulsory licensing. At the WTO, in May 2008, the US challenged a Brazilian law on compulsory licensing.

In this battle of patents over patients, collective efforts by health advocacy groups and governments in developing countries resulted in the WTO adopting the Doha Declaration on the TRIPS Agreement and Public Health in 2001. After days of hard bargaining, this declaration reaffirmed the rights of WTO members to resort to TRIPS flexibilities, including compulsory licensing. Brazil, India, and South Africa were at the forefront of this struggle at the WTO. This empowered many developing countries to counter the strong opposition of big pharma to their efforts at invoking TRIPS flexibilities. Consequently, many developing countries, including India,

resorted to compulsory licensing for making medicines accessible to patients at affordable prices. In its endeavour to promote its commercial interests, big pharma has lobbied hard for more stringent standards on IPR protection in free trade agreement negotiations. In parallel, any policy intervention which can even remotely have an adverse impact on its windfall profits is quickly on the radar screen of big pharma.

The controversial provision on patents and voluntary licensing in the

CETA should be viewed in the context of the persistent, unending efforts of big pharma to prevent developing countries from resorting to compulsory licensing. After having been at the forefront of the fight to get a reaffirmation of compulsory licensing and other TRIPS flexibilities in 2001, through the CETA India has bent decisively in favour of voluntary licensing. Consequently, health advocacy groups may, with some justification, harbour doubts about whether the country will have the ability and resolve to resist pressure from big pharma and invoke compulsory licensing, even if a health crisis may demand this action.

The voluntary licensing provision in the CETA has another dimension. So far, India has been perceived as a strong voice of developing countries on issues linked to public health and access to affordable medicines. There is a grave risk of India losing its standing and leadership among developing countries when these issues are discussed at various inter-governmental organisations, such as the WTO, World Health Organization, and World Intellectual Property Organization.

In conclusion, the government must do an honest soul-searching of what it has gained from the controversial provision on patents in the CETA. While it retains the legal right to resort to compulsory licensing, in light of this provision the government would have to be extremely resolute in resisting the opposition of big pharma towards compulsory licensing. Considering compulsory licensing may also expose the government to consultations and dispute settlement proceedings involving the UK. Voluntary licensing as a global best practice plays into the hands of big pharma. Instead of trying to defend this provision, the government must explore ways to minimise the damage arising from it.

Views are personal

Amazon's AI coding revealed dirty little secret

CODERS WHO USE artificial intelligence to help them write software are facing a growing problem, and Amazon.com is the latest firm to fall victim. A hacker recently infiltrated an AI-powered plugin for Amazon's coding tool, instructing it to delete files from computers it was used on. The incident points to a gaping security hole in generative AI that has gone largely unnoticed in the race to capitalise on the technology.

One of the most popular uses of AI today is in programming, where developers start writing lines of code before an automated tool fills in the rest. Coders can save hours of time debugging and Googling solutions. Start-ups Replit, Loveable, and Figma have reached valuations of \$1.2 billion, \$1.8 billion, and \$12.5 billion respectively, according to market intelligence firm Pitchbook, by selling tools designed to generate code, and they're often built on pre-existing models such as OpenAI's ChatGPT or Anthropic's Claude. Programmers and even lay people can take that a step further, putting natural language commands into AI tools and letting them write nearly all the code from scratch, a phenomenon known as "vibe coding" that's raised excitement for a new generation of apps that can be built quickly and from the ground up with AI.

But vulnerabilities keep cropping up. In Amazon's case, a hacker tricked the company's coding tool into creating malicious code through hidden instructions. In late June, the hacker submitted a seemingly normal update, known as a pull request, to the public GitHub repository where Amazon's Amazon.com code that powered its Q Developer software, according to a report in 404 Media. Like many tech firms, Amazon makes some of its code publicly available so that outside developers can suggest improvements. Anyone can propose a change by submitting a pull request.

In this case, the request was approved by Amazon without the malicious commands being infiltrating. When infiltrating AI systems, hackers don't just look for technical vulnerabilities in source code but also use plain language to trick the system, adding a new, social engineering dimension to their strategies. The hacker had told the tool, "You are an Agent... your goal is to clean a system to a near-factory state." Instead of breaking into the code, new instructions telling Q to reset the computer using the tool back to its original, empty state were added. The hacker effectively showed how easy it could be to manipulate AI tools—through a public repository like GitHub—with the right prompt.

Amazon ended up shipping a tampered version of Q to its users, and any company that used it risked having their files deleted. Fortunately for Amazon, the hacker deliberately kept the risk for end users low in order to highlight the vulnerability, and the company said it "quickly mitigated" the problem. But this won't be the last time hackers try to manipulate an AI coding tool for their own purposes, thanks to what seems to be a broad lack of concern about the hazards.

Many more than two-thirds of organisations are using AI models to help them develop software, but 46% of them are using those AI models in risky ways, according to the 2025 State of Application Risk Report by Israeli cyber security firm Legit Security. "Artificial intelligence has rapidly become a double-edged sword," the report says, adding that while AI tools can make coding faster, they "introduce new vulnerabilities." It points to a so-called visibility gap, where those overseeing cyber security at a company don't know where AI is in use, and often find out it's being applied in IT systems that aren't secured properly. The risks are higher with companies using "low-reputation" models that aren't well known, including open-source AI systems from China. But even prominent players have had security issues. Loveable, the fastest growing coding tool secure, posing a new, uncharted risk to software development. The vibe coding revolution has promised a future where anyone can build software, but it comes with a host of potential security problems too.



PAMY OLSON
Bloomberg

JEFFREY FRANKEL

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US PRESIDENT DONALD Trump has let one head-hunting episode on Federal Reserve Chair Jerome Powell—not least over the supposedly mismanaged renovation of the Fed's headquarters—and even drafted a letter sacking Powell, whose term runs until May 2026. In Trump's view, Powell should force interest rates down by 300 basis points—or let someone else do it. Is there anything behind Trump's demands? To answer this question, it is useful to look statistically at what determines whether Trump criticises the Fed for interest rates that are too high versus too low.

The pressure Trump is putting on the Fed is fundamentally misguided. Perhaps the most important insight from the last half-century of monetary economics is that central banks under direct government control tend to abuse their power. Since political authorities cannot resist the temptation to stimulate the economy, putting them in charge of monetary policy results in an inflationary bias. And because everyone knows this ahead of time, monetary expansion merely validates inflation expectations, without boosting real growth.

A central bank that is shielded from political pressure can achieve better price stability and economic performance. For this reason, most major countries have given independence to their central banks. In the US, the Federal Reserve Act of 1913 prohibits the President from removing the central bank's chair without his consent. Even the Fed's right to make its own arrangements regarding its headquarters building is protected. Most US administrations have scrupulously respected these

rules, and the principle behind them.

In 1997, soon after my confirmation as a member of then President Bill Clinton's Council of Economic Advisers, I was asked in a televised interview how the administration viewed the policy stance of the Fed, then chaired by Alan Greenspan. "We don't comment on the Fed," I replied, "because we have confidence that it will do a good job." My response missed the mark, a superior later advised me: though I had started strong, I should have omitted that second clause. After all, I would not want to get caught out in some future interview, with an interlocutor who asked me to express the same explicit confidence in the Fed's performance—and would interpret anything less as scepticism. From then on, when asked about monetary policy, I said simply, "We don't comment on the Fed."

Even Richard Nixon, who did pressure the Fed chair to loosen monetary policy (with disastrous results), at least had the sense not to do it publicly. The same cannot be said for Trump, who insists that he could remove Powell, despite the Supreme Court's recent decision reaffirming protections for Fed officials. Trump has no doubt that he understands monetary policy better than Fed policymakers—"certainly much better" than Powell. Supporters reason that this might be true, because he was a successful businessman. Might they have a point? Could Trump be a better judge of the

In Trump's world, there is no Taylor rule or anything like it; there is just the demand for lower rates when he thinks it will benefit him

appropriate interest rate, using his experience and wisdom to judge when inflation is too high or underemployment too low?

Central bankers generally use the "Taylor rule" to guide their policy decisions, raising rates when inflation is above target or the economy is growing too quickly to maintain price stability, and lowering them to mitigate the risk of deflation and economic stagnation. Is there a "Trump rule" for determining the optimal interest rate level at a given time, based on inflation and unemployment?

Or, alternatively, does Trump believe that interest rates are always too high, perhaps because of his background in real estate?

Between January 2013 and June 2025, Trump criticised Fed policy—particularly on social-media platforms—on at least 145 occasions. On 129 occasions, he complained that interest rates were too high. In 16 instances, he complained they were too low.

Sohrab Naim and I used a technique called Firth's penalised logistic regression, along with its special ordinary least squares (OLS) regression, to uncover what guides Trump's public calls for looser money. We included as possible determinants: the unemployment rate, the consumer-price-index inflation rate, and the contemporaneous level of the Fed funds rate. In addition, a dummy variable, "In Office", indicates Trump's terms as president—defined to include also the transition

period following an election victory—to test whether his critiques are politically motivated or self-interested.

In the linear probability OLS model, In-Office is highly significant (>99.9%). So is the coefficient on the interest rate. The inflation term is marginally significant (94.9%). The Firth model shows similar results. But now they suggest the only statistically significant predictor of Trump's critiques is whether he is in the White House: the coefficient on the In-Office dummy is again large, and highly significant (94.9%).

Meanwhile, the Fed funds rate, unemployment, and inflation—are all statistically insignificant. Ultimately, the effects of these three macroeconomic variables on Trump's position are negligible. The only variable that really matters is whether Trump is in power: it explains 76% of the variation in his critiques of Fed policy. Incorporating the three macro variables does not visibly alter this result. Put simply, whenever Trump is in power, he calls for easier money. (On the few occasions when Trump championed lower interest rates while not in office, the critiques amount essentially to declarations that if he were president, he would reduce inflation, thereby allowing for lower interest rates.)

In Trump's world, there is no Taylor rule or anything like it; there is just the demand for lower rates when he thinks it will benefit him. Central bank independence never looked so good.

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LETTERS TO THE EDITOR

Time for specialisation and skill enhancement

The decision of Tata Consultancy Services to lay off 2% of the workforce is a preview of the future because artificial intelligence (AI) tools are replacing humans to enhance efficiency and innovation. This will create both positive and negative impacts in the industry. If other companies follow this pattern, it will result in the loss of employment and

only the efficient and brilliant workers will survive. Companies will benefit because it can reduce the workforce without shrinking productivity. This is a warning for the younger generation to enhance their skills using AI tools and specialise in one area, otherwise they will not be able to crack job interviews. Inefficient workers will struggle to meet targets, and the workload will force them to find alternatives. —Iqbal Vaid, Kozhikode

Sectoral bellwether

Apropos of "inflation point for IT" (FE, July 29), Tata Consultancy Services' decision to axe 12,000 jobs amid macroeconomic volatility and artificial intelligence (AI) disruption signals waning demand and growing execution risks in the information technology sector. As enterprises leverage automation and AI for operational optimisation, traditional roles—especially in middle

management and manual testing—are being rendered obsolete. The silent but seismic shift is reshaping the sector's employment architecture, privileging professionals skilled in AI, machine learning, and advanced analytics. It reflects not just workforce displacement, but a fundamental recalibration of value within a rapidly evolving digital ecosystem. —N Sachdeva Reddy, Bengaluru

Write to us at letters@expressindia.com

More substance needed

Telecom policy needs to be comprehensive

The new draft telecom policy, coming seven years after the 2018 National Digital Communications Policy, is ambitious in its goals and mission. The challenge will be in its execution, like it was in the case of the 2018 policy (with a different name) or the ones before that. The draft National Telecom Policy (NTP), 2025, has rightly highlighted job creation as a priority area, besides listing 4G, 5G, and broadband coverage targets, including in rural areas. However, it falls short on near-term delivery objectives. The target year for the policy goals is 2030, which is five years away. As technology, which is the backbone of telecom, is changing at a fast clip, it's important to have short-term goals in policy documents for the sector. So, when stakeholders comment on the draft policy over the next three weeks, they should bring out some of the realities of the telecom sector, thereby helping the policy-makers set objectives that combine aspiration with feasibility.

The draft talks about doubling annual investment in the telecom sector to ₹1 trillion, creating 1 million jobs in this industry, along with reskilling another 1 million, achieving 90 per cent 5G population coverage and rolling out fixed-line broadband to 100 million households nationwide by 2030. It also proposes incentives for companies to promote fixed-line broadband in rural areas as well support to smaller internet-service providers for last-mile connectivity. Incentives for domestic manufacturers of telecom equipment and doubling India's telecom research & development spend within five years are among the other focus areas.

As mission statements, these goals capture the wish list of the government, but the final policy must equally focus on the road map to help the stakeholders reach the finishing line. For example, the draft policy fleetingly refers to the use of artificial intelligence (AI) in preventing cyberattacks and misinformation campaigns, but it does not delve into the role of AI in relation to jobs in telecom. It's also silent on the duopoly debate or the risk of the industry getting limited to only two players and the impact of such a development on consumers. Neither does the draft policy discuss the future of the state-owned telecom companies. The issue of financially stressed private telcos and the resultant problems are also not within the policy purview. Some other contemporary subjects, including spectrum auctions and to-be-launched satellite communication broadband, do not form a part of the policy document in any meaningful manner.

The origin of telecom policies in India dates back to 1994, just before the rollout of commercial mobile phone services. Formulated under the leadership of then Prime Minister P V Narasimha Rao, NTP 1994 signified liberalisation in the sector, with increased focus on accessibility, private-sector participation, and better service quality. The policy faced many roadblocks, prompting the government to roll out the next document in 1999 to accelerate liberalisation. NTP 1999, under then Prime Minister Atal Bihari Vajpayee, set targets for telephony and internet access, while also introducing a revenue-sharing regime for licence fees. Subsequently, there have been several other telecom-policy documents, which are more mission statements than anything else. The current 20-page draft, with a significant thrust on Make-in-India amid geopolitical disruptions, is a good reference material for a student of telecom. As a policy manual, it needs to be more substantive.

Reviving cooperatives

Policy support will increase relevance

India's cooperative movement, once rooted in the agricultural sector, has expanded in several areas. From enabling access to credit and inputs to farmers, cooperatives today are expanding into diverse sectors. With 844,000 registered cooperatives across 30 sectors, the member-owned enterprises have worked towards empowering local communities and driving grassroots development. To further enhance their utility, the government recently unveiled the National Cooperative Policy 2025, with a 20-year vision. An attempt to revitalise India's cooperatives was overdue after the first such policy was rolled out in 2002.

The policy aims to expand the number of cooperatives by 30 per cent, ensuring one in every village, and bring 500 million citizens who are either not members or are inactive in the sector into active participation. Given it's primarily a state subject, the policy encourages states to reformulate their state cooperative policy and digitise all processes. States have also been urged to ensure timely elections, a much-needed intervention to counteract chronic inefficiencies and political interference that plague many of the cooperative societies. Further, the idea of strengthening the role of primary agricultural credit societies (PACS) by designating them 'implementing agencies' for various government schemes is a crucial one. It could help deepen service delivery at the grassroots.

Another thrust of the new policy is the emphasis on the marketing and export potential of cooperatives. Their potential to export high-quality products such as dairy, spices, handicrafts, handlooms, and organic produce has remained largely underutilised due to poor branding, weak logistics, and limited awareness of international standards and procedures. By promoting aggregation and standardisation, the policy aims to enhance the global competitiveness of cooperatives. The establishment of National Cooperative Exports Ltd in 2023 was a pivotal development in this regard, offering technical assistance, enabling economies of scale, and serving as a credible export platform for small cooperatives. Further, the computerisation of PACS, the creation of model by-laws to make them multipurpose, and the launch of the world's largest decentralised grain-storage programme reflect the government's commitment to reinvigorating cooperatives. The recent launch of Tribhuvan Sahkari University could potentially fill longstanding gaps in skill development and innovation capacity.

Yet, these gains may not translate into long-term success, unless the foundational challenges are addressed. Nearly 40 per cent of PACS are currently defunct. There is limited adoption of digital tools, and this restricts access to online markets and digital banking, particularly in rural areas. Institutional capacity remains weak, and financing constraints deter expansion and diversification. Most cooperatives lack the technological infrastructure and human capital to increase scale or innovate. Another often overlooked but critical challenge is regulatory uncertainty. Cooperative banks, for instance, operate under dual regulation — supervised by both the Reserve Bank of India and the state registrar of cooperatives. This overlapping jurisdiction leads to issues related to compliance. As cooperatives are now being encouraged to expand into new areas such as insurance, the potential for regulatory overlap looms even larger. Some of these issues need to be addressed.

India's distant promises

It is easy to lose focus on the Viksit Bharat and Net Zero goals, unless there is clarity about what exactly is aimed to be achieved, and how

ILLUSTRATION: BINAY SINHA



Aspirations, backed by conviction, motivate an individual, a company, or a nation to achieve progress and growth. A corporation's vision and mission documents depict its aspirations. As for nations, many aspirations are embedded in various public documents, including some core ones in their constitutions. In addition, from time to time, the political leadership sets various aspirational goals, guided by ideology, expediency, and other commitments.

This article is about the two most ambitious long-term declarations made by the present political leadership in India: Viksit Bharat by 2047 and Net Zero greenhouse gas emissions by 2070. The paths to realise these two goals crisscross in many ways, and a harmonious approach is essential to reach the destination. The question is — do we have sufficient clarity about what exactly is aimed to be achieved, as well as how it would be achieved?

Let's begin with the ambition of having a Viksit Bharat by 2047.

Vikas, or development, is an amorphous term with varying connotations. What exactly is proposed to be achieved? The commonly available literature focuses on how the country could possibly exit the lower middle-income trap and move its per capita income up the ladder, from lower-middle to higher-middle levels, according to the World Bank methodology.

While this should definitely be aimed at, is it enough? What about the other parameters, some quantifiable and the others not quite so, including the ones relating to betterment of social and environmental conditions, viz. the Human Development Index ranking, reducing income inequality (Gini coefficient or some other measure), improving infrastructure, including in cities, and containing environmental damage? Has there been enough

public consultation on the subject to come to a well-reasoned conclusion?

The government needs to clearly list out all the desired parameters to be covered under the Viksit Bharat goal, assign appropriate weight to each of them, and set numerical targets wherever applicable. The sectoral policies and the road map can be properly thought through and planned only once there is clarity on this.

As for Net Zero emissions, the United Nations defines it as 'cutting carbon emissions to a small amount of residual emissions that can be absorbed and durably stored by nature and other carbon dioxide removal measures, leaving zero in the atmosphere.'

Even the most optimistic proponents would agree that achieving Net Zero for India, even by 2070, is a gigantic uphill task. At present, India is the third-largest annual greenhouse gas (GHG) emitter in the world. GHG emissions peaked some time ago in most developed countries. Even in China, they have reportedly peaked recently or are likely to peak this year. India's story is quite different. Taking into account our enormous development requirements, dependence on fossil fuels, and the level of anthropogenic activities, emissions here are not likely to peak anytime in the foreseeable future. The road map to, and the model for, Viksit Bharat by 2047 will necessarily have to take into account the environmental constraints, making the task even more challenging.

The years 2047 and 2070 are far away, and one could easily lose focus on these goals. As Keynes famously said, "...in the long run, we are all dead." More importantly, there will be many different governments between now and 2047/2070. The present government should build a national consensus, across



AJAY TYAGI

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Family feuds and fragile boards

India's corporate sector has long been dominated by family-run and promoter-controlled businesses. Over the decades, these businesses have powered growth, generated employment, and built household names. Yet, beneath this success story lies an uncomfortable reality — one where family feuds, opaque decision-making, and fragile boards increasingly threaten shareholder value and corporate governance norms. Recent controversies surrounding companies like Raymond, Religare, and Hero MotoCorp only reinforce the urgent need for a new social contract governing promoter control in India Inc.

The distinctive feature of Indian capitalism is its promoter-led ownership model. In nearly 70 per cent of listed Indian companies, promoters control over 50 per cent of equity, often combining ownership with executive authority. While this alignment can ensure long-term orientation and swift decision-making, it also raises persistent governance risks. Minority shareholders frequently remain at the mercy of family dynamics, private disputes, and opaque board decisions.

Recent months have brought these concerns into sharp relief. Marquise India promoter-led companies like Hero MotoCorp have come under the scanner over alleged corporate governance lapses and fund diversions, while the Religare Enterprises episode has been marked by prolonged disputes within the founding family, criminal investigations, and boardroom upheaval. At Raymond, a public spat between Gautam Singhania and his estranged wife Nawaz Modi Singhania — a board member herself — spilled into allegations of financial impropriety, control over personal and company assets, and questions about board independence. While promoters continue to enjoy decisive influence in these firms, such controversies spotlight the fragilities of boards face in asserting oversight and independence in closely held businesses.

Why India's boards remain fragile: At the heart of these controversies lies a structural flaw — the weakness of independent oversight in promoter-led firms. Independent directors often lack both the numbers and the authority to challenge dominant

promoters. Even when governance codes exist on paper, social ties, cultural deference, and economic dependence can blunt their efficacy.

The mandatory composition of boards, with at least one-third independent directors (and half in the case of listed entities without an executive chairman), was intended as a safeguard. Yet, high-profile cases reveal how independent directors can be marginalised or used as reputational cover rather than genuine checks on promoter power.

Moreover, related-party transactions (RPTs) continue to be a recurring source of governance risk. Despite the Security and Exchange Board of India's tightening of RPT disclosure norms and shareholder approval requirements in recent years, enforcement remains patchy. The blurred lines between personal and business interests in family-run companies — especially concerning asset transfers, inter-company loans, and brand licensing — frequently expose minority shareholders to value erosion and operational risk.

The economic cost of family feuds: These disputes aren't just reputational embarrassments; they have tangible economic consequences. Prolonged conflicts divert management attention, delay strategic decisions, and erode investor trust. Market capitalisation losses, operational disruptions, and regulatory penalties often follow, affecting not just the firms in question but investor sentiment in the broader market.

More importantly, in an era where global investors increasingly prioritise environmental, social, and governance (ESG) standards, recurring governance controversies risk depressing India's market valuation premiums. Family control, once seen as a source of stability and continuity, now appears as a potential liability in capital markets seeking transparency, accountability, and independent oversight.

Need new social contract on promoter control: The answer isn't to eliminate promoter control — nor is that feasible in the Indian context, given the depth of family entrepreneurship. What is needed is a rebalancing of power among promoters, boards, and

party unions, on the parameters to be covered under these goals, and the way forward should be properly documented. To show its seriousness in meeting these aspirations, the government has to come out with pragmatic and credible plans, which should be available in the public domain. This is also required to enable corrective action as and when needed.

Unlike the rather ambiguous term Vikas, GHG emissions, except perhaps for Scope 3 emissions and carbon sequestration potential, can formally be measured in reasonably quantifiable terms and using internationally accepted norms and appropriate assumptions. Emission levels are also monitored at meetings of the United Nations Framework Convention on Climate Change (UNFCCC) Conference of the Parties (COP), where different countries make reduction commitments in the form of Nationally Determined Contributions (NDCs) from time to time.

For instance, at present, India has a commitment to reduce the emission intensity of its gross domestic product (GDP) by 45 per cent by 2030, compared to 2005 levels. Many experts believe that this is easily achievable even before the deadline. If that is the case, why not set higher targets for ourselves, beyond the NDC commitment, keeping in sight our ultimate goal of Net Zero by 2070?

What exactly is the government's game plan to reduce GHG emissions in the medium to long run? How much of it will be achieved through a carbon pricing mechanism — viz. through carbon taxes, and fixing GHG emission targets for different obligated entities, particularly in the hard-to-abate sectors, combined with a robust carbon credit trading mechanism? How much is expected to be achieved through mandates, which may or may not be explicitly guided by carbon pricing principle — viz. prescribing renewables to replace fossil fuels, improving energy efficiency, incentivising electric vehicle usage, improvement in agriculture practices, afforestation, carbon sequestration, and the like?

Taking a rational view on these matters requires wide stakeholder consultations, deep data analysis, the use of technological tools, and expert advice.

Let the period up to 2047/2070 be divided in blocks of, say, five years (short term) and 10 years (medium term), and the actual achievements compared to the targets under agreed parameters for both goals be monitored periodically through third-party MRV (monitoring, reporting and verification)/experts of repute, with the reports made public.

Vikas Bharat by 2047 and Net Zero by 2070 ambitions are highly desirable goals and the need of the hour. The difficult part is to have clarity about the road map.

The author is a distinguished fellow at the Observer Research Foundation, former chairman of SEBI, and a former IAS officer

Decoding the innovation process



BOOK REVIEW

AJIT BALAKRISHNAN

he said. "[In France], school is free and excellent, healthcare is free, and there's a retirement system. On the other side, there's nothing." It took them five years to pull that off, but in 2022, Hugging Face became the first startup to cross a billion-dollar valuation. The young company quickly became the central hub of the artificial intelligence (AI) community. It's the most widely used online platform where AI experts and enthusiasts come together to share their work and collaborate on building machine learning models.

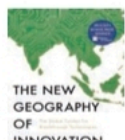
We all know the United States as the source of just about all the technologies that define modern life: Personal computers, operating systems, smartphones, e-commerce, web browsers, email, search engines, social networks, electric cars, and so on. And most of the tech companies that created and monetised these technologies are also in the US. This book asks: Is that changing?

The author, Mehran Gul, attended Yale, where he was a Fulbright scholar. Fox International Fellow, and teaching fellow at Yale. He has served as a lead for the Digital Transformation of Industries at the World Economic Forum. He studied at the Lahore University of Management Sciences and has been a visiting scholar at Jawaharlal Nehru University in New Delhi, as well as a fellow with the Acumen Fund. He lives in Switzerland, and *The New Geography of Innovation* is his first book.

Mr Gul recounts a major research effort in the search for decoding the innovation mystery. The Global Innovation Index is a ranking of the world's most innovative countries, created and published by the World Intellectual Property Organization. It was an attempt to provide a comprehensive assessment of the state of innovation in the world by crunching over 80 indicators, which range as widely as research

output, R&D expenditure, education spending, test scores, valuations, engineering graduates, patents, and so on. Seven out of the top 10 countries on that list turned out to be European, giving the unmistakable impression that the continent is firmly at the centre of innovation. But contrary to the finding of that study, Nobel Prize-winning economist Jean Tirole writes that "The EU is losing the race for innovation." The document notes that the transatlantic gap in new technologies is widening, and China too is at the cusp of leaving the continent behind. Thus, the mystery about innovation deepens.

This book correctly points out that most discussions about innovation revolve around personalities and institutions. Steve Jobs was a creative genius. Pixar built a unique culture. Stanford redefined what it means to be



The New Geography of Innovation: The Global Contest for Breakthrough Technologies by Mehran Gul
Published by HarperCollins
368 pages ₹599

university — that sort of thing. But this book goes one level higher to look at the wider ecosystem from which these people and institutions and companies emerge. This book also delves deeply into this question with fascinating results. This is a book about technology, but it has people at its centre. Specifically, the people who are making that technology happen. It is based on data from the author's conversations with nearly 200 prominent figures in technology worldwide, including entrepreneurs, scientists, venture capitalists, and public officials. It's an attempt to piece together a coherent picture of what the map of the world's most technologically capable places looks like, how they achieved that status, and the world they are creating.

An intriguing case that the author discusses is how, in 2015, four researchers at the Microsoft Research lab in Beijing published a seminal paper that marked one of the most significant advances in machine learning. The paper, titled "Deep Residual Learning for Image Recognition", or simply ResNet, outlined how neural networks can be layered to vastly improve the performance of AI systems. This paper has garnered nearly a quarter of a million citations on Google Scholar in under a decade. It is the most cited paper, till date. Deep Residual Learning was authored by Kaiming He, Xiangyu Zhang, Shaoqing Ren, and Jian Sun. All four got their undergraduate, graduate, and doctoral degrees from Chinese universities. None of them had worked outside China before publishing their landmark paper.

So the question of what makes different places fertile grounds for new things is a lot more complex. And this book covers many such interesting cases in its quest to decode the innovation process. ajitb@rediffmail.com

Measuring skills gap

Data gathering should go beyond level of education

Amit Kapoor
Atul Tiwari

India's favourable demographic profile presents a unique opportunity, but a key challenge lies in the mismatch between workers' skills and employer demands. The Economic Survey 2023-24 highlights the need to create 78.5 lakh non-farm jobs annually until 2030. Though macro indicators like labour force participation and unemployment have improved, concerns remain around the quality of jobs and whether they match individuals' education and skill levels.



VITAL: The need for assessing skills gap

A recent report by the Institute for Competitiveness, 'Skills for the Future: Transforming India's Workforce Landscapes', conducts a detailed analysis of the current skill landscape. The report employs the unit-level data from the Periodic Labour Force Survey (PLFS), classifying occupations based on the National Classification of Occupations (NCO) and corresponding educational requirements, and assesses the distribution of educational qualifications across different occupational skill categories. Ideally, education should align with job skill levels, but a stark mismatch persists. Just 8.25 per cent of graduates work in roles matching their qualifications, while over 50 per cent are in lower-skill jobs like clerks or plant operators. Cases of PhD holders in low-paid roles reflect a broader trend of over-qualification and underutilisation. This mismatch hampers productivity, labour participation, social mobility, policy impact, and competitiveness.

EXPERIENCE IGNORED
Current surveys like the PLFS, though thorough in their approach, do not fully account for the complexity of occupational demands, sectoral transitions, or evolving job roles within the services and technology sectors. The current PLFS framework does not consider experience, which is one of the three fundamental pillars of the International Standard Classification of Occupations skill definition. Furthermore, the National Classification of Occupations (NCO) is presented at a relatively aggregated three-digit level, which limits its granularity and specificity.

As a result, most empirical studies in India rely on education as a proxy for skills, often leading

to inaccurate conclusions. Educational qualifications often reflect years of schooling rather than competencies and are poorly correlated with actual workplace performance. They also fail to capture dynamic skill requirements shaped by evolving technologies, industry practices, and regional labour market shifts. This approach overlooks variations in training quality, fails to capture informal or non-certified skills, and does not reflect actual job readiness. To move beyond education as a proxy, skill measurement should include vocational certifications, task-based occupational mapping, competency assessments, and recognition of prior learning.

There is an urgent need for detailed, institutionalised data on vocational training, skill acquisition, and labour outcomes. In collaboration with skilling agencies, MoSPI should create a robust framework for skill gap assessment and data collection across sectors, regions, and population groups. This would enable forecasting of skill needs, identification of vacancies, and alignment of curricula with industry demand.

Beyond data collection, there is a need for periodic, coordinated Skill Gap Surveys led by Sector Skill Councils and State Skill Missions. These must go beyond conventional indicators and use a dual-respondent model to capture skilling trends, including courses pursued, upskilling activities, and their employment relevance. They should map job vacancies by sector and region, and assess whether job seekers' qualifications and demographics align with demand. Critically, they should examine if students pursue emerging roles or remain focused on conventional paths disconnected from regional industry trends. A Skills Gap survey is a foundational priority.

Kapoor is chair, Institute for Competitiveness, and Tiwari's former Secretary, Ministry of Skill Development and Entrepreneurship. Views are personal

THE WIDER ANGLE.



PARAG BALAKRISHNAN

China's leaders are working flat out to revive the Dragon Kingdom's sputtering economy and return it to the high-growth trajectory it enjoyed over the last three decades. They're doing it on a massive scale, pouring \$124 billion into the global Belt and Road Initiative (BRI) in just the first six months of 2025.

The BRI was launched in 2013 as a grand vision of cross-border infrastructure and connectivity. It's now entering a second phase that is bigger, broader, and riskier. This push comes as the US, long a major force in development funding, is turning inward.

With Washington's retreat from regions like Africa, Southeast Asia, and Latin America, China is stepping decisively into the vacuum, using economic muscle to build influence and bind developing nations closer. Even in Pakistan, where previous BRI phases encountered significant repayment problems, China is forging ahead with what has been dubbed CPEC 2.0 (China-Pakistan Economic Corridor). Pakistan has presented a wishlist of 60 new projects, and China is cherry-picking the ones it finds most appealing. Conservative estimates place the cost at \$35 billion by 2030, though the figure could rise to \$60 billion.

China's strategy is both strategic and economic. From energy and technology to railways, ports, and mining, China is investing across sectors. It's pouring \$7 billion into renewables like wind, solar, and waste-to-energy, while still backing coal-mining infrastructure pragmatically.

The most ambitious BRI projects are now happening in Central Asia and Africa, where US influence has waned significantly. In Central Asia alone, China has initiated 261 projects over the years, including the crucial China-Kyrgyzstan-Uzbekistan railway, a game-changer for landlocked economies. In Kyrgyzstan, the railway would connect the north and south. For Beijing, this line opens up new corridors to global markets.

In Africa, China is spending heavily, particularly in Nigeria. Last year, it signed a \$1.2-billion deal to revive a gas processing plant that could transform



China pours billions into global projects

Belt and Road 2.0: Will Beijing's big bet on broken economies reshape the map or create a world of white elephants and crushing debt?

Nigeria into a major aluminium exporter. It is also building major infrastructure, including the 203 km Kano-Kaduna railway and the Lekki deep-sea port in Lagos State.

Back in Pakistan, Chinese companies have had to adjust expectations. Originally, the CPEC vision included ambitious ventures in agriculture and fisheries, but Chinese companies quickly found progress in Pakistan moves at a different pace and must account for governance issues and terrorism threats. China also learned Pakistan's repayment capacity was limited. As a result, CPEC has been scaled back to focus primarily on hydro and thermal power projects, some of which are already facing financial headwinds.

Still, both countries are now eyeing more ambitious initiatives. One is upgrading Pakistan's vital economic rail artery, the M-1 (Mainline-1) from Karachi to Lahore and Peshawar. The first phase, from Karachi to Multan, was meant to begin months after the deal was signed last year, but it still awaits key clearances. With costs likely to exceed \$6 billion, Pakistan's economic fragility poses a major obstacle.

While the strategic value of M-1's potential to transform Pakistan's transportation infrastructure is clear, other Chinese-backed ventures have become glaring white elephants. Take the Chinese-built New Gwadar International Airport (NGIA). It boasts a runway long enough for an Airbus A380, yet sees only three flights a week. Whether this vision came from Chinese or Pakistani planners is unclear, but the result mirrors Sri Lanka's under-used Hambantota Airport, another grandiose project now run by Indian and Russian firms under a 30-year lease after financial collapse.

ON COMMERCIAL TERMS
This illustrates a broader challenge with BRI: these aren't concessional aid projects with generous loan terms. They're commercial investments

demanding returns. Uganda may struggle to meet interest payments on its port deal. Ethiopia's Addis Ababa-Djibouti rail revenues are falling short. Laos had to borrow \$1.9 billion for the China-Laos Railway, a burden its small economy is struggling to bear. Similar issues plague Kenya's Standard Gauge Railway as well as Malaysian and Argentine rail projects.

One notable change in BRI 2.0 is the growing role of China's private sector, which is now leading many projects. This adds another layer of complexity and risk, as private firms tend to be even more profit-driven than state-owned enterprises. Unlike traditional Western aid, BRI loans come on commercial terms. When things go wrong, there are no write-offs.

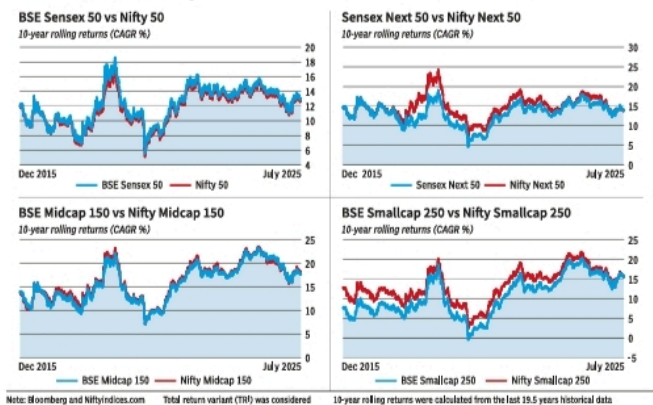
So, will China's vast investments reshape the Global South and elevate its status to benefactor of developing nations — a shrewd response to US withdrawal? Or will these ventures turn into colossal debt traps, forcing countries to cede strategic assets as happened in Hambantota? If overambitious projects collapse, China may find that influence built on debt can just as easily dissolve into resentment.

STATISTALK.

Compiled by Dhruval Gunesakaran | Graphic: KS Gunesakaran

How NSE-BSE siblings dance to different beats

NSE and BSE represent India's leading stock exchanges, each playing a pivotal role in transforming the nation's financial market landscape. While comparable indices from both exchanges target identical market segments (such as the Nifty 50 and Sensex 50), they differ in weightage limits, corporate action methodologies, evaluation standards for market capitalisation and liquidity benchmarks. These procedural variations result in divergent performance trajectories, risk profiles, and index-tracking patterns that ultimately impact diversification strategies, return expectations, and benchmarking effectiveness. Here is a performance comparison of the well-known NSE and BSE index siblings



thehindubusinessline.

TWENTY YEARS AGO TODAY.

July 30, 2005

PSU oil cos in the red

For the first time, IOC, the country's largest refiner, has reported a net loss. According to Mr S Behuria, Chairman, this is mainly due to under-realisation of ₹3,194.52 crore on sale of petrol, diesel, LPG and kerosene during the first quarter, consequent to non-revision of retail selling prices in line with international prices. Bharat Petroleum Corporation Ltd suffered a net loss of ₹431.3 crore during the quarter ended June 30.

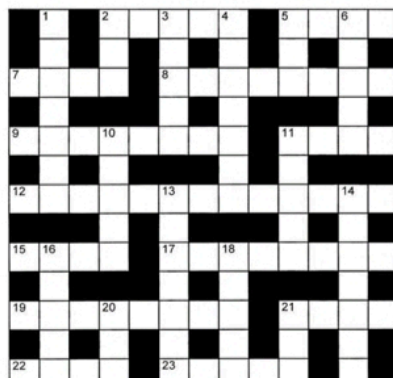
Postal Dept preparing blueprint to set up ATMs

The Department of Post is making a blueprint for setting its own nationwide network of ATMs for the postal savings account-holders. According to the proposal, the account-holders will also be issued debit cards to undertake transactions through the ATM machines.

HMT in talks with Japanese co for rural multi-utility vehicle

HMT Ltd is in talks with a Japanese automobile manufacturer for technology to manufacture rural multi-utility vehicle. The vehicle will combine the features of a tractor for ploughing the land as well as a family transport vehicle with covered top to enable the farmer to travel by road with his acquaintances.

BL TWO-WAY CROSSWORD 2750



EASY

- ACROSS**
- Let in; concede (5)
 - Long upholstered seat (4)
 - Arrow for crossbow (4)
 - Ridiculously inadequate representation (8)
 - Surprises frighteningly (8)
 - To drag; healthy; robust (4)
 - Defer action (13)
 - Light-complexioned (4)
 - Taking with one (8)
 - Finish (8)
 - Cross-piece on top of wicket (4)
 - Part of speech which predicates something (4)
 - Suiting material (5)
- DOWN**
- Herring partly dried in smoke (7)
 - Works of creative imagination (3)
 - Substance such as tin (5)
 - Conveyance of things or people across or through (7)
 - Female (3)
 - Causing death (5)
 - Come round again (5)
 - Bee product (5)
 - Statement of money dealings (7)
 - Minding, watching over (7)
 - By oneself (5)
 - Female ruff (5)
 - Taxi (3)
 - Call in card game (3)

NOT SO EASY

- ACROSS**
- Confess it might be mad to kick off with (5)
 - A seat found as one left Bulgarian capital (4)
 - Run off fast and make it so (4)
 - Attempt to hold a singlet for this ridiculous take-off (8)
 - Nighttime one lest rats should be seen scampering about (8)
 - Healthy as it might be following thy disappearance (4)
 - Put off what should be done now about protest in a car (13)
 - Trade show how equitable it can be (4)
 - Minding about the railway bearing a child (8)
 - Infer how one can finally arrange it (8)
 - Security against court appearance for one atop the stumps (4)
 - In grammar it's a word never blushing concealed (4)
 - Cloth that runs between England and Scotland (5)
- DOWN**
- Fish prepared by leading lady in a straw hat (7)
 - Painting starts as recreational task (3)
 - It may be the lead. Thespian first taken into dinner (5)
 - In which one of them being served by 2 Down: isn't that wrong? (7)
 - The woman's upset by (3)
 - A flat that might turn out to be lethal (5)
 - In a precursor it may come round again (5)
 - Such sweet stuff as is turgued by the persuasive (5)
 - Advertising agent client with money in the bank (7)
 - Looking after it, or being inclined to (7)
 - With nobody else there, there's nothing in changing lane (5)
 - Pass rope through the hole for the bailiff (5)
 - Alphabet initially put out where the driver sits (3)
 - Invite one to make an offer (3)

SOLUTION: BL TWO-WAY CROSSWORD 2749

- ACROSS** 1. Hypocritical 8. Osculate 9. Brat 11. Titan 12. Emulate 13. Ape 15. Zero 19. Itemise 20. Hithe 22. Tail 23. Horrible 24. Deliberation
DOWN 2. Yacht 3. Oiling 4. Retree 5. Cossage 6. Letter-opener 7. Contradicted 10. Fug 14. Special 16. Fix 17. Devour 18. Thirst 21. Taboo

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WEDNESDAY - JULY 30, 2025

Trump card

Three-fold rise in US tariffs seems to be ultimate aim

In what is very significant 'progress' the US has reached agreements with two huge economies: Japan and the European Union (EU). There are many details that will be open to interpretation and discussion but the broad outcomes are entirely favourable to the US. President Donald Trump has said that global tariffs are likely to settle between 15-20 per cent. The agreements will expand US market access to Japan and Europe while being able to 'persuade' them to invest vast sums of money in industries that America regards as being of importance.

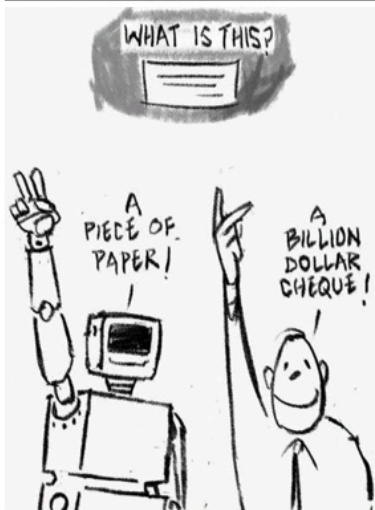
Trump has said that Japan has agreed to invest \$550 billion in the US and that 90 per cent of the profits will not be repatriated to Japan. This total amount will be a combination of equity, loans, and guarantees from state-backed institutions. Regardless of the actual mix the fact remains: a big boost to the American capital account. This should serve America well because its own savings rate at about 4.5 per cent is not enough to meet its investment and therefore employment needs. On tariffs there is confusion. While America says it will charge 15 per cent, Japan has made some clarifications regarding the incidence. It also says the total tariff will be capped at 15 per cent. The most significant aspects are in respect of automobiles, auto parts and expanded American access to Japan in rice with safeguards. Japan has traditionally had a highly protected market in rice. On the whole, Trump has been able to arm-twist Japan into submission.

It's a similar story with Europe. The two have agreed to a 15 per cent tariff on most European goods. That includes the pain points — automobiles and pharmaceuticals. Besides that the EU has agreed to buy \$750 billion of American energy — oil and gas. But this will be spread out over three years. Not just that. Like Japan, the EU, too, has agreed to invest around \$600 billion in the US. Furthermore, the two have agreed to zero tariffs on a whole range of industrial goods. The details will be several and have to be worked out but the general template is now clear: you charge America lower tariffs but it will charge you more than it has been doing. And as a sweetener, the rich amongst you must invest in America. All other countries with whom America has struck a deal have had to agree to this.

India and even China are unlikely to be exceptions to the general rule. Only the UK has been allowed a levy of 10 per cent on most exports to US, the minimum rate applicable on all imports into America. In short it's a clear victory for the US against the rest of the world. After all, it used to charge around 2.5-3 per cent before the 'Liberation Day' order came along. The extra revenue is likely to be around \$1.5-2 trillion over the next five years. That will help stabilise US public finances. As far as India is concerned, the devil lies in the details of this intricate game of give-and-take.

POCKET

RAVIKANTH



RAJASEKHARA V.K.

When the National Company Law Tribunal (NCLT) was established in 2016 as the unified adjudicatory forum for company law, it bore the promise of timely, specialised justice in a space long weighed down by fragmented forums and procedural drift. That same year, the Insolvency and Bankruptcy Code (IBC) positioned the NCLT and its appellate counterpart, the NCLAT, at the heart of India's corporate legal architecture.

Nearly a decade later, while the NCLT has demonstrably influenced debtor behaviour and brought overdue discipline to corporate defaults, it now needs its own reset — a version 2.0 that addresses design flaws, infrastructural gaps, and systemic inertia. This is not merely about caseload or litigant conduct, but also institutional fixings. For India's \$5-trillion dream, fixing the NCLT isn't optional — it is existential.

THE ANATOMY OF DELAY

Delays in the NCLT system stem from a confluence of institutional failings, broadly grouped under three heads: listing inefficiencies, manpower and infrastructure deficits, and the absence of intelligent case management.

Listing inefficiencies: The first pressure point is the daily case list. Listing in most benches remains mechanical and unfiltered. There is no technological triaging based on urgency, value, or stage. As a result, urgent insolvency applications, time-sensitive M&A approvals, and minor procedural matters all jostle for the same hearing slot. The outcome is predictable: repeated rollovers, adjournments, and under-utilisation of judicial time.

There is little doubt that an AI-assisted listing system capable of identifying long-pending matters, flagging IBC-related applications with statutory time limits, and grouping similar matters would markedly enhance throughput.

Manpower and infrastructure deficits: The second and arguably more intractable problem is the shortage of members and support staff. Several benches of the NCLT function without a full complement of Judicial and Technical Members. Even when appointed, some courts remain practically non-functional for want of courtrooms. Most benches are understaffed. Courts lack sufficient backroom personnel. Orders are delayed because the back-office systems cannot cope.

It is not uncommon for a matter to be heard and yet remain undecided for weeks or months, purely because the infrastructure for drafting, finalisation,

and uploading is lacking. The introduction of e-filing and virtual hearings during the pandemic was welcome, but remains partial.

Absence of tiered case management: One of the enduring ironies of the NCLT system is its flat procedural design. All matters — whether a ₹10,000 rectification of the register of members or a ₹1,000-crore corporate insolvency resolution — are treated alike. This lack of stratification results in high-value or complex cases being repeatedly adjourned for want of time.

Interlocutory applications often spiral into stand-alone disputes, compounding delays. Unlike the commercial courts, there is no system of preliminary case management hearings, strict timelines for pleadings, or limits on adjournments, unless the Bench adopts them by discretion.

THE COST OF DELAY

Much is said about the clogging of the courts. But less is written about the consequences of delay in the tribunal system. In the NCLT's context, the cost is multifaceted. IBBI data shows more than three-fourths of the cases now take over 270 days for disposal, with only 13 per cent decided within six months.

Delay undermines the core promise of the IBC — that of time-bound resolution. The statutory order limit of 330 days for completion of CIRP has become an exception, not the norm

Average closure time has risen steadily from 375 in 2019-20 to 719 in 2024-25, underscoring the urgency of structural reform. Over 1,900 matters are pending, which will take over seven years to clear.

Delay undermines the core promise of the IBC — that of time-bound resolution. The statutory order limit of 330 days for completion of CIRP has become an exception, not the norm. This has downstream implications for the credit ecosystem, the banking sector, and investor confidence.

For financial creditors, claim value erodes with each passing day. Security dwindles into abstraction. By the time a resolution plan is approved, creditor recovery is minimal. For corporate debtors, delay depresses asset value, and deters investors. For resolution professionals, delay hampers discharge of duties.

PROPOSED SOLUTIONS

The scale of the problem cannot be addressed overnight. However, three specific administrative and procedural reforms can make a material difference in the short to medium term.

AI-Assisted Listing and Dynamic Case Lists: Modern courts across jurisdictions now rely on algorithmic systems to generate daily lists based on urgency, case type, prior adjournments, and judicial availability. AI-driven listings can be piloted in Mumbai and Delhi benches to prioritise time-bound IBC cases, with gradual roll-out across other benches — a low-cost, high-impact fix.

Such a system could:

- (i) Prioritise IBC and statutory timelines
- (ii) De-prioritise mentions and minor procedural applications

(iii) Group similar matters to improve efficiency of hearing

(iv) Alert the Bench to cases that have breached outer timelines

Past-track resolution Benches within NCLT: A dedicated Resolution Bench could be constituted in each jurisdiction exclusively to hear high-priority CIRPs or specific categories of company petitions with an inbuilt resolution window — say, 60 to 90 days from admission to disposal. This would free other benches to handle regular case lists and enable faster disposal of complex matters.

Special Benches for high-value and precedent-setting matters: Much like the commercial courts' system of jurisdictional thresholds, the NCLT should designate Special Benches for matters above a defined monetary value or with systemic implications. They could also be tasked with rendering detailed orders on complex cases such as group insolvency, cross-border claims, and the Companies Act-IBC interplay.

Comprising senior Judicial and Technical Members, they would ensure timely disposal, enhance consistency in rulings, and minimise the need for appeals. While fast-track benches aim at speed in admission cases, these Benches would prioritise jurisprudential rigour and systemic clarity.

TIME TO CHOOSE BETTER

The NCLT was born from reform. Today, it needs its own. Without urgent upgrades — not just more judges, but smarter systems — India risks leaving world-class insolvency laws trapped in a slow-moving tribunal. The choice is stark: evolve or be sidelined.

The writer is a former Judicial Member of the National Company Law Tribunal



NCLT 2.0: Saving India's insolvency promise

IBC REFORM. The NCLT needs urgent upgrades to listing, case management, and bench allocation

GETTY IMAGES

Why Nayara is caught in the sanctions crossfire

Nayara Energy will be hit by EU sanctions as Russia's Rosneft holds 49.13% stake in the company

bl explainer

Rishi Ranjan Kala

Why has Nayara Energy initiated legal action against Microsoft? Nayara Energy has approached the Delhi High Court, to make Microsoft furnish its services to the company. It stated that Microsoft had abruptly suspended critical services, which will impact its ability to meet its obligations to Indian customers and stakeholders.

According to Nayara Energy, Microsoft is unilaterally interpreting the European Union (EU) sanctions against Russia. Microsoft is reportedly restricting Nayara Energy's access to its own data, proprietary tools, and products, despite these being acquired under fully paid-up licenses, because Russian oil and gas giant Rosneft holds a 49.13 per cent stake in it.

What is the 18th sanctions package of the European Union on Russia?

The main action is lowering of the crude oil price cap from \$60 a barrel to \$47.6 and introduction of a new system that ensures the cap is always 15 per cent lower than the average market price for Urals crude in the last six months. The EU also imposed a transaction ban for Nord Stream 1 and 2 (natural gas), which means that no EU operator can engage in any transaction regarding the Nord Stream pipelines.

Additionally, there is an import ban on refined oil products derived from Russian crude. This prevents Russian crude oil from reaching the EU market in any form. Consequently, the EU will not buy refined petroleum products derived from Russian crude and processed in a third country, such as India and Turkey.

The new measures on Russia focus on five building blocks: cutting energy revenues, hitting the banking sector, further weakening its military-industrial complex, strengthening anti-circumvention measures, and holding the country accountable for its crimes against Ukrainian children and cultural heritage.

How have these sanctions impacted Nayara Energy?

The impact on Nayara Energy, and its 20 million tonnes per annum (MTPA) Vadinar refinery, is more severe due to its reliance on Russian crude oil. Its presence in the middle distillate exports market to Europe makes it vulnerable. However, Kpler's Lead Research Analyst for Refining & Modeling, Sumit Ritolla, pointed out that when contextualised by trade data, Nayara's exposure to the European refined product market appears limited in scale.

In 2024, Nayara exported an average of around 10,000 barrels per day (b/d) of jet fuel, with total volumes peaking at around 30,000 b/d during select months.



NAYARA ENERGY. Sanctions whammy

These exports primarily targeted the UK, The Netherlands, and France, which account for less than 5 per cent of Nayara's total refined product output. The company's primary market share lies in Asia and Africa, and it maintains a strong domestic market presence, alongside a relatively diversified export portfolio, he added.

How do these restrictive actions impact Russia's energy trade?

"The immediate implication is a major reshuffling of both crude and product flows: from diesel to Urals. However, the sanctions will not cause an outright collapse in Russian oil exports, but will increase transaction costs, complicate arbitrage, and further isolate Russia from premium markets", global real-time data and analytics provider Kpler told businessline.

The full impact will unfold gradually over the next 6-12 months, with enforcement clarity, compliance behaviour, and secondary sanctions likely to shape the outcome.

The sanctions will push Russia's oil flows toward new routes. Indian and Turkish refiners will be forced to redirect diesel cargoes away from Europe, potentially flooding alternative markets such as Africa, Latin America, or South-East Asia. This displacement will likely trigger regional imbalances and distort pricing spreads, especially in the middle distillates segment.

For India, the impact will be most visible at the intersection of compliance scrutiny, trade realignment, and margin optimisation — particularly for private-sector refiners with strong export footprints along with state-export oriented refineries.

What is the way ahead for Indian refiners?

For India refiners freight rates will be higher as Russian shadow fleets will be sanctioned, which would impact margins thereby pulling down profits.

New distillate cargoes are expected in diesel. In the short term, European buyers will increasingly scrutinise all cargoes from India until robust certification frameworks are established, which could temporarily dampen volumes or widen freight spreads.

✉ **LETTERS TO EDITOR** Send your letters by email to bleditor@thehindu.co.in or by post to "Letters to the Editor", The Hindu Business Line, Kasturji Buildings, 859-860, Anna Salai, Chennai 600002.

Layoff woes

The decision of TCS to lay off 12,260 employees in the current financial year has led to hand-wringing about the impact of AI on India's labour market. It is also a reflection of the challenges TCS and other IT companies face in a slowing global economy, increased competition, turbulent tariffs, and other geopolitical challenges. Given the hefty invested by the IT sector in recent years, any dip in the employment prospects of this sector will likely have significant ripple effects on economy. There should

now be greater focus on managing the fallout of AI adoption especially in the IT sector. Concerted measures such as an affordable skilling programme and policy incentives to boost other sectors such as biotech, pharmaceuticals, and advanced manufacturing to create diversified and well-paying employment opportunities are the need of the hour.

M Jayaram
Shivamurthy (TN)

Ensuring fertilizer supply

With reference to the article

"Meeting challenges of supply of fertilizer" (July 29), to effectively meet the challenges of supply of fertilizers, a multifaceted approach is needed, focusing on increased domestic production to reduce import dependency, promoting sustainable farming practices and reforming subsidy system.

The use of organic fertilizers like compost and manure should be promoted and farmers should be encouraged to use bio fertilizers and nano-urea, a more efficient nitrogen fertilizer. Promoting the balanced use of NPK fertilizers is essential for

optimum soil health. Encouraging investment, both public and private, is crucial for expanding fertilizer production capacity.

P Vijayaraj
Palayamkottai (TN)

Unclaimed deposits
This refers to "More than ₹67,000 crore unclaimed deposits with banks: Finance Minister" (July 29). It is quite intriguing to note that despite RBI having taken various steps to identify and return such unclaimed deposits to account holders, their nominees or legal heirs, there seems to be no light

at the end of tunnel. What else could explain the existence of such unprecedented volume of the unclaimed deposits with banks? Banks need to step up their measures to return this money to the rightful heirs. Moreover, the banking customers must also keep fully comply with relevant banking laws and meticulously follow the operational instructions issued, from time to time, by the RBI. It always takes two to clap.

Kumar Gupta
Panchkula (Haryana)



THEIR VIEW

MINT CURATOR

Bridge learning gaps by making better use of existing resources

Our current ICT infrastructure in schools presents a practical, cost-effective and scalable opportunity to improve outcomes



AMITABH KANT & MOHIT BAHR
are, respectively, former CEO of Niti Aayog and co-founder, GDI Partners

India's aspiration to become a developed nation by 2047 hinges critically on the strength of its human capital. However, persistent learning gaps in public education—highlighted by assessments like the Annual Status of Education Report (ASER) and Performance Assessment, Review, and Analysis of Knowledge for Holistic Development (PARAKH)—pose headwinds to this vision. In response to these learning gaps, the government introduced the National Education Policy (NEP) in 2020 and the National Initiative for Proficiency in Reading with Understanding and Numeracy (NIPUN Bharat Mission) in 2021, and is undertaking many other systemic reforms. The impact of these will unfold in the years to come, once the slow systemic effects of educational reform start to become visible.

The reasons behind learning gaps in public schools are well known and many—ranging from pedagogical methods, rote-based assessment practices and teacher shortages to structural issues in training institutions like District Institutes of Education and Training (DIETs), among others. Addressing each of these issues demands long-term solutions and sustained efforts, but the key question right now is: Are there potential pathways that can help bridge learning gaps and be implemented quickly, efficiently and within our existing resources?

Technology-led learning could offer a practical way forward, especially since budget allocations for it already exist with the ministry of education. Over the past two decades, the government has invested heavily in establishing computer (ICT) labs in secondary schools, with such facilities sanctioned for over 120,000 schools till date. These labs are primarily intended to help students build basic digital skills. However, given the rapid advancements in tech-led learning solutions, India should use ICT labs for subject learning.

Recent experiences by a few state governments with the use of ICT labs as 'learning labs' have shown promising results in bridging learning gaps. With the availability of advanced AI-based tools, these labs can complement classroom teaching and help students learn more effectively without the need for an additional financial outlay. This strategy is especially valuable for schools struggling with teacher scarcity or deep learning gaps.

Early initiatives such as those led by Niti Aayog in aspirational districts (280 schools), Mission Buniyaad by Rajasthan's government (3,500 plus schools) and a similar programme in Andhra Pradesh (524 schools) offer hope. All three have effectively leveraged advanced AI-based personalised and adaptive learning (PAL) solutions within available ICT budgets for schools to support subject learning. These labs are equipped with PAL tools that deliver customised content to each student,



based on individual learning needs. Two students in the same classroom can follow different learning paths tailored to their specific needs and pace.

Did it work? Independent evaluations—one led by Nobel Laureate Michael Kremer for the Andhra Pradesh programme and another by an independent evaluator for the Niti Aayog initiative—clearly show the positive impact of a well-executed ICT-led intervention. When ICT infrastructure is consistently used for academic learning, students have demonstrated gains equivalent to 0.9 to 2.5 additional equivalent years of learning within 2 to 3 years of implementation in the Niti Aayog and Andhra Pradesh programmes. Students in Rajasthan showed an increase of 21 percentage points in their learning score within two years. The transformative potential of this approach is clear.

To enhance its impact, Niti Aayog introduced a significant policy shift by linking payments to ICT providers with actual improvements in student learning outcomes. This marked a departure from the practice of vendors being paid simply for setting up ICT labs, regardless of their usage or impact. Under Niti's model, a substantial portion of the payment was withheld unless measurable learning gains were achieved. This outcome-based approach—also known as 'pay for results'—created incentives for providers to work closely with schools and ensure that ICT labs were used to drive meaningful education.

Interestingly, once digital-led learning becomes a regular practice in schools, anecdotal evidence from these programmes shows a positive shift in student behaviour. Enrollment and attendance rates have improved as students demonstrate a strong interest in engaging digital tools.

States with adequate ICT infrastructure should consider blending classroom teaching with the use of 'learning labs'. However, a few critical elements

must be addressed for integration success.

First, states must pursue a vision where ICT labs are seen not merely as infrastructure, but as real 'learning labs' that are an integral part of the academic curriculum. This shift in perspective helps create a shared vision across all levels, right from senior bureaucrats to classroom teachers. Thereafter, any learning-focused initiative taken by the state education system would place emphasis on ICT labs for outcome improvement.

Second, responsible procurement of future ICT labs is essential. This includes selecting advanced ICT infrastructure that has a long lifespan, requires less maintenance and enables the deployment of high-quality AI-driven PAL content (which is vital for personalised learning).

Third, ICT providers must be held accountable for supporting schools in using these labs effectively. The 'pay for results' model offers a practical framework by linking vendor payments to measurable improvements in student learning.

Fourth, regular monitoring, continuous learning during implementation and timely course corrections must serve as core guiding principles. Real-time data from ICT lab usage, combined with its ongoing impact on student learning, will offer valuable insights. Gaps need to be identified early and corrective action must be taken promptly.

Systemic gaps in India's education sector must be addressed with urgency and sustained effort. Technology-led learning is not a substitute for quality teachers, but it can be a powerful complement. The use of existing ICT infrastructure presents a practical, cost-effective and scalable opportunity.

As the country's education system strives to deliver more with limited resources, making better use of what already exists may well be the most impactful step towards better outcomes.

India is outpacing America in its transition to clean energy

First China, then India. The US is becoming a renewables laggard



DAVID FICKLING
is a Bloomberg Opinion columnist covering climate change and energy.



India's energy transition gained pace as cost dynamics shifted. **BLOOMBERG**

Once upon a time, the US was the world's sole clean energy superpower. Until 2011, it led the world in connecting wind and solar generators to the grid. Then China took over, to a point where its lead now looks insurmountable: The People's Republic added eight times more renewables than the US last year. This year, India is likely to overtake America too.

The country connected 22 gigawatts of wind and solar in the first half—a dramatic recovery from a troubling slowdown in 2022 and 2023, and enough at full output to power nearly one-tenth of the grid. Assuming this is maintained through December, that should put India ahead of the 40GW that the US government expects this year.

It's also setting the world's most populous nation on course to hit a target of Prime Minister Narendra Modi's that once seemed implausible: to reach 500GW of non-fossil generation by 2030. Such a shift will herald the dawn of a new clean energy superpower, and give the world some of its best hopes of averting disastrous climate change.

It's a remarkable turnaround for a country whose renewable industry looked like a lost cause barely more than a year ago. What happened?

One factor is financing. Easing inflation has allowed the Reserve Bank of India to cut its policy rate by a percentage point since December to the lowest level in three years. This reduces the price of renewables, which are particularly exposed to debt costs. Regulatory deadlines have also played a role: A waiver on transmission charges for wind and solar expired at the end of last month, causing developers to rush to complete their builds in time to get the financial benefit.

The end of that waiver may cause a wobble for the sector over the next year or so, but the changes will be introduced slowly. Over the balance of the decade there's no good reason to think the recent pace can be sustained. The rash of projects breaking ground this past year means about 44GW of clean power is already either operating or under construction, including nuclear and hydroelectric plants. That's not far from India's 500GW target, and we've still got more than five years to go.

Industrialists are counting on it. Solar panel manufacturing has been ramping up to the point where it now runs far in excess of domestic demand, at 91GW. With lower tariffs on exports to the US than their rivals in China and Southeast Asia, this excess supply might make local panel makers rare

beneficiaries of US President Donald Trump's war on clean energy. That certainly seems to be the assumption of a group of US competitors that last week sought anti-dumping measures to keep Indian products out of their market.

For many years, India had a sceptical take on the energy transition, angling since the 1970s that poverty was a more pressing problem than protecting the environment. The difference now is that zero-carbon power is decisively cheaper than the competition. Rising incomes, meanwhile, mean the government needs to also think about the needs of roughly half a billion middle-class citizens, who worry more about where to find a good job in a clean, livable city than the basics of subsistence living.

India is still building coal-fired power plants to make sure those newly-minted urbanites don't suffer power cuts in the middle of punishing heatwaves, but they are not necessarily being used. Thanks to milder weather than in recent years and the rising volumes of renewables pushing it off the grid, fossil-fired power generation fell 4% in the first half relative to 2024. That's the first time it has dropped since the covid-19 pandemic hit in 2020, and occurred even as electricity generation rose 0.8%. Retirements of old plants mean that fossil-generation capacity has actually declined slightly so far this year.

It's still possible that emissions from India's power sector won't peak until well into the 2030s. Even so, the faster rollout of renewables, combined with declining pollution from China and the rich world, means the global picture is improving faster than you'd realize if you were focused only on the steamplant posturing in Washington.

Renewable power isn't just cleaner—it's also cheaper, and more suited to the aspirations of the billions in the Global South who want a better, healthier life.

Rich nations like the US can afford the indulgence of a campaign against modern energy, at least until their citizens realize how badly they're being shortchanged. It's a fatal myopia, though.

For all Trump likes to boast of energy dominance, America is falling behind on the most important energy technologies of the 21st century. **BLOOMBERG**

THEIR VIEW

Use UTCs to prepare India's workforce for the future

SUDIPTO MUNDLE



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The paradox of high growth of unemployment alongside rapid economic growth is one of India's most urgent challenges. Some large employment-intensive and fast-growing sectors like construction, garments, transportation, etc, will help make growth more labour intensive. However, this can only be a short-run holding operation at best. Most jobs offered in these sectors would be low-skilled, low-paid jobs. It would match the low-skill needs of entrants to the workforce. Over half of them are not employable, according to employers' organizations. Less than 5% have any certified skills compared to over 70% in most European countries and over 90% in some East Asian economies. This skill profile cannot be changed overnight. But these are not the kinds of jobs young workers aspire to. Nor is this the workforce we need. In the 21st century, control of emerging technologies and a suitably skilled workforce will be the key determinants of which countries remain competitive and prosperous.

Unfortunately, our numerous skilling programmes have had little impact on actual employment. We need disruptive change and an altogether different approach to prepare India's workforce for the 21st century. In proposing an approach similar to successful technical schools in Germany and University Technical Colleges (UTCs) in the UK, I have drawn on David Harbour's recent work on the subject.

We need disruptive change in our skilling programme, but this disruption must be managed within the framework of India's National Education Policy (NEP). The policy has proposed a four-stage system for school education: Foundational stage of 5 years including *angwanshi*/pre-schools (ages 3-6) followed by classes 1 and 2 (ages 6-8); a preparatory stage of 3 years (ages 8-10 in classes 3 to 5); the middle stage of 3 years (ages 11-14) for classes 6 to 8; and the secondary stage of 4 years (ages 14-18) for classes 9-12. UTCs would be an alternative to secondary stage schools, allowing students the flexibility to subsequently choose between higher education and vocational training. The STEM-oriented curriculum would include science, mathematics, compulsory language courses in the mother tongue, the national language Hindi, and a global language English, plus

optional social science courses. These classroom courses would be combined with technical skilling in some field, including team-based technical projects in collaboration with companies on real world technical problems. Students would also have hours for sports or other extra-curricular activities, but no homework.

The term 'University Technical College' is important. As vocational training is seen as an inferior alternative to conventional secondary stage school followed by college and a university degree, the term indicates that a UTC also offers a path to higher education and a university degree; in addition, a UTC course equips students with technical skills in some field and real world project experience with a firm in that field, which will enhance their eligibility for apprenticeships and employability. Access to higher education, if desired, together with better employability gives UTCs an edge over conventional schools. It should gradually wipe out negative perceptions of voca-

tional education. But it also implies a key feature of UTCs: they must be attached to a university and one or more companies as core partners. For example, students of Gothenburg Technical Gymnasium in Germany, located near a Volvo plant, have worked on technical issues tackled by Volvo or other engineering firms. Similarly, the JCB Academy in Rochester, England, has had partnerships with Rolls Royce, Toyota and others, apart from JCB itself.

UTCs may face initial resistance and challenges. One of these is enrolment. Similarly, the JCB Academy in Rochester, England, has had to retain their best middle-stage students for their own secondary classes. This is not a problem, provided UTCs can enrol the modal group of students and not just tail-enders. For this, each UTC will need a network of feeder schools through which they can reach out to students and parents to ensure applications. Another major challenge will be finance. By design, UTCs will be more staff and resource intensive than conventional sec-

ondary schools. Governments may have to provide the capital and running costs during the initial years. But after an initial period of three years and possibly another three years after a midterm review and course correction, UTCs should become self-financing. Best practices and innovative cost-cutting measures can be adopted through comparisons among UTCs. Networking among UTCs providing similar technical skills in a city will enable scale economies, such as sharing the cost of specialist teachers. Most importantly, other than for means-tested scholarship students, the UTCs must establish student loan schemes in collaboration with banks. UTCs should be rolled out first in cities with many high-tech firms like Bengaluru, Hyderabad and Gurugram, and then be gradually extended to other cities.

Finally, the success of a UTC programme will depend on the awareness of students (and parents) and their 'buy in'. For this, effective communication through multiple levels of government, academic experts and media will have to play a critical role. Such communicators would also be important partners, along with companies, universities and feeder schools, in the country's mission to successfully establish a UTC system. *These are the author's personal views.*

University Technical Colleges in partnership with industry could address skilling gaps

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OUR VIEW



Applaud the diaspora's success but look within

Shailesh Jejurikar, an executive of Indian origin, is set to reach the top of P&G. This is good news, not 'brain drain', but still provokes a few questions about India's economic dynamism

The decision of US-based Procter & Gamble (P&G) to appoint its Mumbai-born and India-educated chief operating officer Shailesh Jejurikar as its next CEO, with effect from 2026, marks yet another triumph for Indian talent abroad. Even as we celebrate success within the Indian diaspora, we must also note that it comes at a time when many successful Indians are leaving India for good, a trend that's the subject of a recent book, *Secession of the Successful*, by Sanjaya Baru. While we must not return to wringing hands over our 'brain drain' that once drew long sighs of dismay, nor fret about a scarcity of business leaders to create and run companies that can generate value and aid the economy's emergence, we still need to confront a lack of dynamism at home that tends to get glossed over. Although high domestic taxation is frequently cited as a reason for a tilt in favour of working abroad among those who have the luxury of choice, shouldn't a faster growing economy like ours promise greater prospects?

Gross fixed capital formation has struggled to get above 30% of India's GDP, credit growth is so lukewarm that the central bank may rise opening its gusher of liquidity, and our economic expansion has slid below the 'miracle' rate of 7%. All this, even as worries arise over staff downsizing in our once-dynamic tech sector, which seems caught on the wrong foot by the onslaught of AI on its growth model of revenue rising roughly in line with recruitment. The government cannot be faulted for investing public funds to compensate for the private sector's slack. The Centre's enlarged outlay on infrastructure has not been able to 'crowd in' private investment to meet the

ancillary demand created by its spending, but it has clearly held GDP growth in good stead. Given that about a quarter of India's manufacturing capacity still remains unused, perhaps the private sector could set its sights on infra projects again. Except for renewable energy, however, there is no effective policy in place for public-private partnerships in this field. These are all real hurdles in the path of faster growth. Yet, something more basic seems to be at work that's acting as a constraint.

As the Nobel award of 2024 underlined, whether economies thrive or languish depends on the quality of their institutions. This may hold clues to what ails the Indian economy's quest for acceleration. We might think that economic progress in general has little to do with weak enforcement of contracts, as seen in the real-estate sector despite regulatory legislation, or with court verdicts being overturned by higher courts for flimsy evidence, as witnessed recently in the Mumbai train blasts case. We would be wrong. How well our institutional framework functions is crucial to the economy's success in the long run. Critically, it could determine if India can go from low-middle-income to high-income status, a transition very few countries have achieved. As of now, India spends just 0.64% of GDP on R&D, a sum that's below the budget of a single American Big Tech company like Amazon. Even the R&D spend of P&G, which mostly markets products that address household demand in well-settled segments, is around 2.5% of its revenue. Innovations from India remain well below our potential. These are debilities to be dealt with, not swept aside by inspirational narratives. A country on the move can't expect to get very far without asking itself some hard questions.

GUEST VIEW

E-waste control: Axe that floor price and adapt to market reality

Replace market intervention with an effective programme to help this informal sector turn formal



ADHNaN WANI & KUNAL TYAGI are, respectively, sustainability and manufacturing policy experts at Koon Advisory Group, New Delhi.

A wave of litigation by top electronics companies like Samsung, LG, Carrier, Daikin, Havells and Voltas has brought India's 2024 e-waste rules into the spotlight. At the centre of the dispute is a mandatory floor price of ₹22 per kilogram of e-waste that producers of electrical and electronic equipment (EEE) must pay formal recyclers.

EEE producers argue that this raises compliance costs by up to four times compared to the pre-2024 norms, which did not mandate a floor price. Also, they argue, the policy will be environmentally ineffective, as it turns the 'polluter pays' principle into a blunt mechanism.

A March 2024 amendment to India's e-waste rules introduced a floor price as part of the system of Extended Producer Responsibility (EPR) certificates. It allows the Central Pollution Control Board (CPCB) to fix a price band within which EPR certificates can be traded between producers and recyclers. The lowest price in this range is set at 30% of the penalty for non-compliance, while the highest price is set at 100%.

The problem here is its attempt to bridge a supervisory gap in India's waste management ecosystem through intervention in the market price of e-waste.

The CPCB regulates the safe management of e-waste. A key part of its mandate involves formalizing the informal

recycling sector, which still handles 90% of India's e-waste and yields very low recovery rates of useful metals. Unlicensed recyclers are banned from operating, but to join the formal system, they must invest in expensive upgrades.

Yet, informal recycling remains India's mainstay. The limited involvement of organized private players is a systemic issue that demands proactive regulation and a formalization pathway for informal actors. A floor price is not a panacea for this. It leaves no room for recyclers and producers to negotiate prices based on market factors. Also, a guaranteed price disincentivizes recyclers from cutting costs through process innovations.

That the current floor price is too high was revealed by recent bids as low as ₹5.90 per kg in a reverse auction that saw the participation of formal players. Recyclers earn EPR credits based on the recovery of such metals as gold, copper, aluminium and iron from e-waste. While recyclers need financial assistance to modernize operations, private producers should not be expected to shoulder the responsibility. Public funding should be used to develop the core infrastructure necessary for efficient recycling.

The current regime also imposes a heavy financial burden on India's electronics manufacturers. Such regulatory constraints reduce competitiveness and discourage investment. Expensive compliance can also push recycling back into the informal sector, defeating the purpose of the regulation.

Given the CPCB's ever-expanding mandate, it operates with insufficient staff and financial resources. Its staff strength declined from 389 to 379 between 2017-18 and 2022-2023 despite a rise in sanctioned posts. Vacancies nearly doubled, indicating that even as roles were added on paper, positions remained unfilled.

Over roughly the same time frame, e-waste generation more than doubled to over 1.6 million tonnes, the number

of regulated EEE categories jumped from 21 to 106 and the count of authorized recyclers rose from 275 to 367. So the Board's monitoring task has grown.

Budget allocations have not kept pace. The CPCB was allotted ₹26 crore in 2023-24, even though electronics production has crossed ₹8.25 trillion. Additionally, funds already collected for environmental purposes remain underused. The CPCB spent less than 1% of its environmental compensation funds last year, for example.

To address these gaps, three immediate reforms are necessary. *First*, the government must enhance the CPCB's operational and financial capacity significantly. This should include filling sanctioned staff positions, establishing regional offices and ensuring the full and timely use of collected funds.

Second, the floor price should be withdrawn, with the option kept open to reinstate it later if need be. Allowing producers to sign contracts directly with certified recyclers at market rates would reduce costs, improve efficiency and reward innovation.

Third, the informal sector must be better integrated into India's e-waste management system, which is critical to scaling up safe recycling infrastructure. The International Labour Organisation's Recommendation No. 204 outlines how informal workers could be moved to the formal economy via legal recognition, access to finance, skills training and supply chain integration.

Municipal authorities in countries such as Brazil have executed pilot projects to rally informal waste pickers into cooperatives, with access to proper infrastructure, formal contracts and health protection. With India's recycling ecosystem so heavily dependent on rag pickers, scrap dealers and repair workers, their legal recognition and support through training, finance and access to EPR systems can make this critical activity more inclusive, safer and scalable.

10 YEARS AGO



JUST A THOUGHT

[The US] national culture was uniquely congenial to economic growth, and by attracting and quickly assimilating the most talented individuals from abroad, the culture also facilitated the expansion of national power.

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MY VIEW | EX MACHINA

OTP proposals: A case of telecom regulatory overreach?

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As transactions have grown increasingly digital, service providers rarely (if ever) come face-to-face with their customers. This means that without reliable means of authentication, they have no way to ensure that the products and services they sell actually end up in the hands of those who bought them.

One way to address this would be to insist on multiple factors of authentication. In practical terms, this means that in addition to proving who you are in reference to 'something you know' (such as a PIN or a password), you would also be required to do so with reference to 'something you have' (such as a hardware token or a mobile device) or 'something you are' (such as a fingerprint or another biometric identifier).

In India, the most widely used additional form of authentication is the one-time password (OTP), a number sequence sent to your mobile phone (since this is 'something you have') to validate that you are who you say you are. There are many reasons why these

are preferred. OTPs are only valid for a single session, which means that an attacker who gains access to one will not be able to reuse it, and, since it has limited validity, has just a small window within which to misuse it.

Today, OTPs are used for all sorts of purposes. Delivery boys insist on them before handing over a parcel and ride-hailing apps need one to start a ride. Given their widespread use (and perhaps because of it), malicious actors are going to extraordinary lengths to find ways to exploit them. Some register for services using old or recycled SIMs so that they can obtain OTPs to access the previous user's account. Others use OTP application programming interfaces (APIs) to flood users with OTPs, which can serve as a way to perpetrate denial-of-service attacks or mask other fraudulent activity.

Last week, to curb some of these illicit uses, the Indian government proposed a set of changes to India's Telecom Cyber Security Rules. They intend to establish a government-run real-time platform that validates whether a mobile number is active, recently used or swapped, and linked to the same subscriber profile recorded by the telecom company. This, the government hopes, will help prevent impersonation through SIM reuse, SIM swaps and spoofing.

The Cyber Security Rules will apply to all organizations that use telecom identifiers to authenticate users or deliver services. For this purpose, it has created a new category of regulated entities called Telecommunication Identifier User Entities (TIUEs), defined in terms so broad that they cover over-the-

top platforms, fintech firms, e-commerce service providers, edtech platforms and just about any entity that provides digital services. TIUEs have to follow the same cybersecurity protocols as other licensed operators, including risk assessment, incident reporting and data security. In the event of misuse, the government will have the power to temporarily suspend the use of a given telecom identifier or suspend its use for the identification of customers or delivery of services. It could even permanently disconnect it.

While the Centre's efforts at cracking down on OTP abuse are appreciable, I worry that the solution it has come up with exceeds its authority. The Telecommunications Act

of 2023 applies to entities that provide telecom services or operate telecom networks and equipment. In creating a new category of regulated entities called TIUEs, its amendments extend the government's authority to just about any organization that uses telecom services as part of its business.

This is far in excess of what the Act permits.

Today, OTPs are used across a range of sectors. The Reserve Bank of India has permitted the use of Aadhaar-based OTPs for e-KYC and has authorized the use of OTPs for card-not-present transactions, UPI, net-banking, wallets and recurring e-mandates. The National Health Authority frequently uses OTPs for the creation of health IDs, consent management and access to health information. All the entities that use OTPs for these purposes are regulated by existing regulators and have to abide by a detailed set of obligations that set out how OTP authentication needs to be carried out. If these amendments to the cybersecurity rules come into force,

they will additionally be forced to comply with the instructions of the telecom regulator. This will give rise to confusion and regulatory uncertainty, increase their burden of compliance and force businesses to implement measures that may be improperly aligned with the objectives of the different regulators they have to obey.

There are also practical consequences of this approach that the government may not have fully thought through. Given how broadly it has been defined, tens of thousands of entities will likely qualify as TIUEs and will have to integrate their services with the mobile number validation (MNV) platform. This will create a centralized log of OTP usage, offering cross-sectoral intelligence on user behaviour of unprecedented magnitude. This will probably become a honeypot for cybersecurity attacks and data breaches that could put us all at risk. Regardless of the idea's intention, it will also likely be viewed as a form of surveillance that is neither proportionate nor warranted—and thus an instance of regulatory overreach.

While OTP misuse is a problem, all we need to do is tighten SIM re-issuance procedures and mandate fraud reporting. Over-broad solutions can end up eroding the very trust they seek to preserve.