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India’s goods trade deficit at 42-month low following dip in gold, crude imports

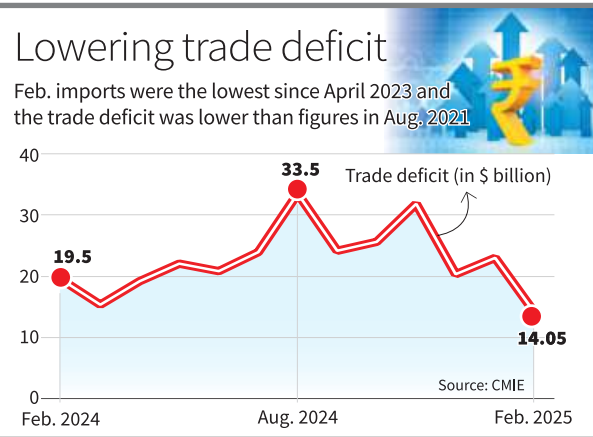
Ashokamithran T.
MUMBAI

India's goods trade deficit was down to a 42-month low of \$14.05 billion as imports of gold, silver and crude dipped in February, show data from the Commerce and Industries Ministry. The difference between import and export of goods was \$22.9 billion in January. In February 2024, the merchandise trade deficit stood at \$19.5 billion.

India's gold and silver imports were at \$2.7 billion, which was the lowest since June 2024, when the value was \$2.5 billion.

As for crude and petroleum, imports were at \$11.89 billion, which was the lowest since July 2023, when the value was at \$11.81 billion.

India exported goods worth \$36.9 billion in February 2025. Imports, ho-



wever, slipped to a 22-month low of \$50.9 billion.

On a year-on-year basis, exports dipped 10.84% in February 2025.

“A portion of the YoY decline in merchandise exports can be attributed to the base year effect related to the leap month,” Aditi Nayar, chief economist at the credit rating agency ICRA, wrote in a state-

ment. Imports however shrunk 16.3% in the reporting month as against the corresponding period last year.

“The trade deficit was significantly lower than the average of over \$23 billion during the first 10 months of FY2025,” Ms. Nayar said.

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Trade discussions with U.S. ‘positive’, says official

India has ‘proactively engaged’ with the U.S. to boost trade, says Commerce Secretary; he says talks are being held on multi-sectoral deal and to raise trade between the countries to \$500 bn

Jagriti Chandra
NEW DELHI

India and the U.S. are “proactively engaged” in boosting trade between the two countries, Commerce Secretary Sunil Barthwal said on Monday.

“We are proactively engaging with the U.S., and discussing mutually beneficial issues which can increase the trade between the two countries,” Mr. Barthwal told presspersons on Monday in response to questions on U.S. President Donald Trump’s plan to impose reciprocal tariffs from April 2.

He described the talks that Commerce Minister Piyush Goyal had in the U.S. between March 4 and 6 with U.S. Trade Representative Jamieson Greer and U.S. Commerce Secre-



We are proactively engaging with the U.S., and discussing mutually beneficial issues which can increase the trade between the two countries. All the measures required will be discussed bilaterally.

SUNIL BARTHWAL
Secretary, Department of Commerce

tary Howard Lutnick as “positive”, and said these “positive talks will continue”.

The senior government official said that these talks were taking place within the framework of “Mission 500”, which aims at increasing trade between the two countries from \$200 billion to \$500 billion, besides negotiations on the bilateral trade agreement

which he said will be multi-sectoral.

Silent on Tesla

Mr. Barthwal declined to comment on the specific issue of tariffs on premium electric cars from the U.S., such as those made by billionaire Elon Musk-owned Tesla, and the status of the revised import policy announced last year to woo the American automaker.

He declined comment on whether tax sops would be extended for Tesla beyond the export policy as it has not yet come forward to express interest in domestic manufacturing to avail itself of the benefits of the policy.

The Scheme to Promote Manufacturing of Electric Passenger Cars, which offers a lower custom duty of 15% to a manufacturer setting up production facility in India, was notified in March 2024.

Mr. Trump had said that if Tesla were to build a factory in India to circumvent tariffs, it would be “unfair” to the U.S. He had also called out India’s high duty on cars during Prime Minister Narendra Modi’s visit to the U.S. last month, but agreed to work towards an early trade deal.

India, New Zealand to institutionalise defence ties: Modi

Kallol Bhattacharjee
NEW DELHI

Prime Minister Narendra Modi said on Monday that India and New Zealand would “strengthen and institutionalise” defence and maritime cooperation and

reminded his counterpart from New Zealand, Christopher Luxon, that the two countries had fought global terrorism. India believed in development and not in expansionism, the Prime Minister said.

“We have decided to

strengthen and institutionalise our defence and security collaboration. In addition to joint exercises, training and port visits, a road map for bilateral defence industry collaboration will be developed. Our Navies are working togeth-

er in the Combined Task Force-150 for maritime security in the Indian Ocean,” Mr. Modi said after delegation-level talks at Hyderabad House.

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Defence Minister Rajnath Singh with U.S. National Intelligence chief Tulsi Gabbard. PTI

Rajnath raises SFJ issue with Gabbard

Dinakar Peri
NEW DELHI

Defence Minister Rajnath Singh, at a meeting with U.S. Director of National Intelligence Tulsi Gabbard here on Monday, asked the U.S. to declare the Khalistan separatist group Sikhs for Justice (SFJ) a terrorist organisation, official sources said. The SFJ is headed by Gurpatwant Singh Panun. “We discussed a wide range of issues which include defence and information sharing, aiming to further deepen the India-US partnership,” Mr. Singh said on X.

“The Defence Minister conveyed that the SFJ was involved in terrorist activities, and is supported by Pakistan’s Inter-Services Intelligence. He asked the U.S. to act against them,” said a source.

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Cheetah Gamini, four cubs released into wild in Kuno

Cheetah Gamini and her four cubs were released into the wild at the Kuno National Park (KNP) in Madhya Pradesh on Monday, offering tourists a unique opportunity to spot the big cats during safari rides. The release raised the number of cheetahs in the wild to 17, while nine felines are staying in enclosures. “Gamini, the South African female cheetah, and her four cubs (two males and two females, aged 12 months) have been successfully released in the Khajuri forest area of the KNP in Sheopur district,” Additional Principal Chief Conservator of Forests Uttam Kumar Sharma said.

PTI

SCs in Telangana to be placed in 3 groups to provide 15% quota

The Hindu Bureau
HYDERABAD

The Telangana government on Monday decided to provide reservations for the Scheduled Castes (SCs) on the basis of three major groups within the community.

The State government has decided to provide 1% reservation from the existing total of 15% quota to 15 SC communities categorised as most socially, economically, and educationally disadvantaged/overlooked, which form 3.29% of the total SC population in the State.

The Group-II constituting 18 communities, comprising 62.75% of the SC population, will be provided

State govt. will give 1% reservation to 15 most overlooked communities

ed 9% reservation. The third category, comprising 26 significantly benefited SCs forming 33.96% of the SC population, will be given 5% reservation.

Bill passed The Legislative Assembly on Monday passed the Telangana Scheduled Castes (Rationalisation of Reservations) Bill, 2025. The Bill follows the Supreme Court’s direction permitting sub-classification within the Scheduled Castes reserved categories.

M. Rajeev
HYDERABAD

The Telangana government on Monday set in motion the process to enhance reservation to the Backward Classes (BCs) to 42% in education, jobs, and polls to local bodies.

The Assembly passed two Bills – the Telangana Backward Classes, Scheduled Castes, and Scheduled Tribes (Reservation of seats in educational institutions and of appointments or posts in services under the State) Bill, 2025 and the Telangana Backward Classes (Reservation of seats in rural and urban local bodies) Bill, 2025.

The Bills, once approved by the Union government, would ensure



The process to enhance reservation in education, jobs, and local body polls was set in motion by the Revanth Reddy govt. FILE PHOTO

that BCs get 42% reservation, Scheduled Castes 15%, and Scheduled Tribes 10%. Piloting the Bills, Backward Classes Welfare Minister Ponnampalapati Prabhakar said the Bills were formulated for inclusive development of marginalised classes and was one of the major concerns during the formation of Telangana State. There had been

numerous demands from the BC associations, people, and political parties to enhance reservations in view of their backwardness and inadequate representation, he said.

Supreme Court order Based on the Supreme Court’s direction that if a State wanted to exceed the 50% reservation limit,

then it was required to base its decision on quantifiable data, the government had accordingly conducted the Socio, Economic, Education, Employment, Political and Caste Census.

It also set up a dedicated commission headed by former bureaucrat Busani Venkateshwara Rao to conduct rigorous empirical enquiry into the backwardness in representation of BC communities in local bodies.

In the process, the Bill passed by the previous BRS government enhancing reservations to BC communities from 29% to 37%, and ST communities from 6% to 10%, which was awaiting assent of the President, was withdrawn.



Recipe for failure

The U.S. should engage with the Houthis instead of bombing Yemen

Donald Trump came to power with a promise to shut down the wars in Ukraine and West Asia. But in less than two months, Mr. Trump, like most of his predecessors, started bombing another country. This time it is Yemen, one of West Asia’s most impoverished countries. Trump administration officials say the “pre-emptive” strike, targeting the Ansar Allah (better known as the Houthis), was to prevent Shia militants from attacking the shipping lanes of the Red Sea. The targets: Houthi missile launchers and the homes of the movement’s leaders in Sana’a, Yemen’s capital, and Sa’dah, the mountainous base of the rebels. “The minute the Houthis say, ‘We’ll stop shooting at your ships’, we’ll stop shooting at your drones,” said U.S. Defence Secretary Pete Hegseth, indicating a long-drawn campaign. The Houthis have said that at least 53 people including five children have been killed, and vowed to meet “escalation with escalation”. On Sunday, they launched ballistic and cruise missiles and drones to target aircraft carrier *USS Harry S. Truman* and other warships in the region, according to Yemen state TV.

The Houthis, who captured Sana’a in 2014, “declared war against Israel” in 2023 in solidarity with the Palestinians, after Israel launched the war on Gaza, following the October 7 Hamas attack. Using missiles and drones, the Houthis have attacked over 100 commercial vessels in the Red Sea. There was a lull in the Houthi attacks after the Israel-Hamas ceasefire came into force on January 19. The U.S.’s latest strike has come as the Houthis were reportedly planning a resumption of attacks on Israeli vessels for violating the ceasefire agreement. But Mr. Trump wants to send a bigger message to the Houthis’ backers – Iran. Earlier this month, he had reached out to Iran to discuss its nuclear programme, an offer Tehran has not taken yet. By launching a massive air strike against the Houthis, one of the strongest members of the Iran-backed resistance network, Mr. Trump is unmistakably telling the Iranians that he is not hesitant to use force. But Mr. Trump is also stepping into a strategic abyss. The Houthis are not just a ragtag militia. They are the state in half of Yemen. They have survived seven years of relentless Saudi bombing. The Biden administration along with its European allies also carried out dozens of strikes, while Israel launched at least four massive strikes. But none of these attacks blunted their fire power. Mr. Trump is repeating the recipe for failure, which could kill more Yemenis and push many more into misery, besides destabilising the region further. It is high time the world started engaging the Houthis to bring peace to the waters around Yemen instead of mindlessly bombing Yemen.

A jab in time

India must push for vaccination against the flu for the elderly

With recent reports indicating a rise in the seasonal influenza cases in the Delhi-NCR area, it is once again time to issue a cautionary note and make a renewed effort to push adult vaccination in the country. The predominant strains involved this season are Influenza A and Influenza B, many treating physicians and pulmonologists have reported. Influenza, with the moniker flu, is a contagious respiratory illness caused by viruses. While it is routinely conflated with the common cold, since the symptoms present similarly – sudden cough and sore throat, with high fever, accompanied by muscle pain, body aches, headaches, fatigue and stuffy nose – it is not quite the same. Both are caused by different viruses and can have varying symptoms and severity. The flu causes mild to serious illness, requiring hospitalisation sometimes, and in a few cases, mostly coinciding with a delay in hospitalisation, can even lead to death. In India, there are two peaks of seasonal influenza, one from January to March and the other in the latter part of the southwest monsoon, in August-October. India has developed a near real time surveillance of cases of Influenza like Illness (ILI) and Severe Acute Respiratory Infections (SARI) presenting themselves in health facilities. This programme was further strengthened and made more robust during and after the COVID-19 pandemic. There is also real time surveillance through the country-wide network of diagnostic laboratories. Epidemiologists say influenza surveillance is a key tool to keep tabs on circulating strains, and define seasonality, besides, playing an important role in syncing vaccination with relevant circulating strains. With all this information in place, it is highly unlikely that health managers will miss any seasonal uptick of cases.

However, the task at hand for governments is a little more complex – it is about being prepared to handle the outbreak by anticipating it and inculcating a sense of preservation, particularly among the high-risk groups ranging on the extremes of the age spectrum. Attention should be paid to children, senior citizens and people with chronic respiratory conditions. Key among the interventions recommended is increasing awareness on vaccination for influenza; in fact, people of all ages will benefit from a periodic shot of the updated flu vaccine. While vaccination for children is, by and large, acceptable, and an area of focus for all health managers, adult immunisation gets the short shrift. At the moment, it is left to the whims and resources of State governments to offer adult vaccinations. Targeted awareness campaigns must be clear, urgent in tone, and make an impact on the high-risk groups particularly, because, very simply, vaccines save lives.

India continues to get closer to the Taliban, with reports that Prime Minister Narendra Modi will allow the regime in Afghanistan to appoint a new envoy for its embassy in New Delhi.

This comes on the heels of the first high-level meeting between India and the Taliban in January, with India’s Foreign Secretary Vikram Misri and acting Taliban ‘Foreign Minister’ Amir Khan Muttaqi meeting in Dubai to discuss strengthening political and economic ties, and providing humanitarian aid.

India’s relationship with the Taliban has been trending this way for some time, beginning when New Delhi reopened its embassy in Kabul in June 2022, almost a year after the Taliban retook power in Afghanistan.

But accepting a Taliban diplomat in India would be a significant shift, all but recognising the regime as the legitimate rulers of Afghanistan. This is something most countries have refused to do because of the Taliban’s abysmal treatment of women, with 1.4 million school-age girls deliberately denied their right to education and women forbidden from most jobs. More recently, women have also been banned from beauty parlours and national parks, cruel steps to remove them from the public eye. The situation is so bad it has been called “gender apartheid” by United Nations experts. New Delhi believes that this is the time to back the Taliban, seeing a chance to gain influence in a country seen as strategically important for India’s interests.

China’s quick moves
China has already beaten India to Kabul, becoming the first country to accept the credentials of a Taliban envoy last year and funding several infrastructure projects in Afghanistan. Beijing is also considering letting the Taliban join its lucrative Belt and Road Initiative,



Chris Fitzgerald
is a freelance journalist covering Afghanistan and director of the Platform for Peace and Humanity’s Indo-Pacific program

India risks getting its fingers burnt by engaging with the Taliban

which would bring the regime firmly into its sphere of influence.

India can also get a jump on rival Pakistan, with its formerly warm relationship with the Taliban now ice-cold. Once seen as natural allies, the Taliban has sought independence from Islamabad and has forged relationships with the wider region, including China, Russia and its Central Asian neighbours. A former patron of the Taliban, Pakistan now finds itself lacking influence in Kabul.

A wave of terror
But engaging with the Taliban comes with significant risks, something India will need to consider before it gets involved in Afghanistan.

The country has become a hotbed for terrorism under the Taliban. The Islamic State (IS) is running rampant, conducting deadly terror attacks across Afghanistan that target the regime and the interests of its allies.

This includes the assassination of Taliban ‘Minister’ and powerbroker Khalil Ur-Rahman Haqqani in December and threatening to bomb the Chinese embassy in Kabul in 2023. This came after an IS attack on a Kabul hotel popular with Chinese nationals in 2022 that left three dead and injured 18 people.

Russia has also been targeted, witnessed by the IS attack on Moscow’s Crocus City Hall in March 2024 that killed at least 140 people and injured more than 500. In early March this year, Russia’s security agencies killed a man in a shootout in a Moscow subway who was suspected of being affiliated with the IS.

The Taliban has also been accused of supporting its affiliate, the Tehrik-e Taliban, to carry out attacks in Pakistan. A spate of attacks late last year led to Pakistan conducting airstrikes on terror camps in Afghanistan and subsequent clashes at border crossings between the Taliban

and Pakistan’s armed forces.

The relationship between the Taliban and Islamabad has completely broken down over the Taliban’s inability to reign in terror groups operating within Afghanistan. The problem is getting worse, not better, with the Tehrik-e Taliban claiming to have carried out 147 attacks on Pakistani soil in February alone, killing 180 soldiers. Recently, the group’s affiliate, the Jaish Al-Fursan, claimed responsibility for a suicide bombing at an army compound in northwest Pakistan that killed nine and injured 25.

It is a matter of concern that India has already caught the ire of the IS. In December, the group claimed responsibility for an attack on the Indian consulate in Jalalabad that killed one person and injured two others. This came after a United Nations report last year said that the IS has sought to recruit ‘lone actors’ to carry out large-scale attacks in India. India is now clearly in the firing line.

Need for caution
New Delhi has long called for Afghanistan to be free of terrorism, and this should be a key demand before any further engagement with the Taliban takes place. This includes the Taliban collaborating with regional partners to defeat the IS and forcing the group to renounce the support of the Tehrik-e Taliban.

Afghanistan has always been a dangerous place to be invested in, having suffered from political instability and terrorism for decades. The Taliban’s inability or unwillingness to solve these problems makes it just as risky a prospect today.

India should heed the lessons of rivals China and Pakistan, who have had their fingers burnt after engaging with the Taliban and investing in Afghanistan. With India’s tragic history of terrorism at home, New Delhi might decide this is a risk just not worth taking.

The barriers faced by construction workers

Construction is the fastest-growing sector, contributing about 9% to the national GDP and projected to reach \$1.4 trillion by 2025. Around 3 crore workers are estimated to be working in this sector in India by 2030. However, last month, Larsen and Toubro Chairman and Managing Director, N. Subrahmanyam, voiced growing concerns over labour shortages in the sector. He said that some workers are reluctant to relocate for work due to the availability of welfare schemes, which offer them financial security. This narrative oversimplifies the structural issues that construction labourers face.

A fragmented journey
Construction workers, especially migrant labourers, endure a fragmented employment landscape characterised by frequent relocations, high job insecurity, inconsistent access to welfare benefits, and precarious working conditions. Despite legal frameworks such as the Building and Other Construction Workers (Regulation of Employment and Conditions of Service) (BOCW) Act, 1996, accessing welfare entitlements remains a significant challenge. Around 5.65 crore construction workers are registered with State construction boards. These have collected around ₹70,000 crore cesses, which are to be used for the welfare of construction workers. But this amount largely remains unutilised due to a series of issues.

A primary barrier for construction workers is obtaining and maintaining the documentation required for welfare registration. Proofs of identity, date of birth, and residence are essential documents for accessing benefits. However, due to the transient nature of their work, many labourers lack permanent addresses, making it difficult for them to secure documents such as birth certificates, residence proofs, and rental agreements.



Tarun Cherukuri
Founder and CEO,
Indus Action



Harshil Sharma
Director
Government
Relations, Indus
Action

The narrative that welfare schemes disincentivise work oversimplifies the structural issues facing construction labourers

The requirement for an ‘employment certificate’ validating 90 days of work in a year further complicates the process. This document is typically issued by employers, but in the case of a few States, it is substituted by self-certification or a trade union certificate. Still, employers are majorly called or visited for verification. Contractors are unwilling or unable to provide certificates or requisite information to the State, leaving workers unable to prove their eligibility. Additionally, verification protocols vary across States.

While State governments collect a 1-2% construction cess under the BOCW Act to fund worker welfare, approximately 75% of it remains unutilised, according to a 2023 Parliamentary Standing Committee report. This discrepancy is largely due to the fragmented nature of worker databases, inconsistent verification protocols, and cumbersome registration processes. For example, construction workers affected by seasonal employment disruptions, such as heat waves, struggle to access direct benefit transfers despite legal provisions. During the ban on construction due to air pollution in north India, lakhs of workers lost their livelihoods but faced delays and administrative challenges in securing financial relief. The lack of digital public infrastructure to facilitate rapid disbursement exacerbates their vulnerability.

Migrant workers often move across multiple States searching for employment, but the absence of interoperable systems means that benefits registered in one State cannot be accessed in another. For instance, a worker registered under the Haryana BOCW Board loses access to welfare if he relocates to Delhi. This disrupts continuity in welfare delivery and discourages workers from registering altogether.

Proposed solutions
To address labour shortages in the

construction industry, we propose the following actionable reforms. First, a unified national labour identification system, akin to the One Nation One Ration Card scheme, would facilitate inter-State portability of welfare benefits. If BOCW registrations are linked to UAN on e-Shram and worker data across States is integrated, construction labourers could access their entitlements regardless of their location.

Second, State governments should adopt open-source digital platforms to improve the accessibility and efficiency of welfare schemes. Implementing a centralised portal with standardised workflows would reduce administrative delays and enhance transparency. Such platforms can also support automated verification through Aadhaar seeding and real-time tracking of welfare disbursement.

Simplifying documentation protocols by accepting alternative proofs, and relaxing the verification protocols, can ease the process. State governments can facilitate bulk registration through on-site camps, ensuring that large construction projects maintain accurate worker records. This would reduce dependency on employer-issued certificates.

Investing in skill development programmes for construction is essential for addressing long-term labour shortages. A robust skilling ecosystem tailored to meet the evolving demands of the industry can enhance worker productivity and retention. But skilling alone is not enough – ensuring safe and dignified work environments is equally critical for maintaining workers’ health and efficiency. Construction firms can play a key role in this by committing to both medium-term skilling initiatives and improved workplace standards, creating a more stable, skilled, and resilient workforce.

In conclusion, labour shortages cannot be addressed without acknowledging and resolving the systemic barriers to welfare access and employment continuity.

H-1B workers with master’s degree doubled in 2020s from 2000s

Key facts about the H-1B program and its workers, as bipartisan calls for reform gain momentum in the U.S.

DATA POINT

The Hindu Data Team

The landscape of H-1B visa approvals has undergone a dramatic transformation over the past two decades, according to data collated by the Pew Research Survey.

At the start of the millennium, 57% of approved H-1B workers had a bachelor’s degree, while only 31% had a master’s degree. By 2021, these numbers had flipped – only 34% held a bachelor’s degree and 57% had a master’s degree (Chart 1). This means that a four-year degree has become less sufficient for securing a visa.

In the 2000s, about 10% of approved H-1B applications were renewals, while most were new. By the 2020s, renewals had grown to one-third of all approvals (Chart 2). So, it has become increasingly tough for new applicants to secure a H-1B visa.

The denial rate for H-1B applications dropped to a record low of around 2% under former President Joe Biden, down from a peak of 15% during Donald Trump’s first term. Under Barack Obama, it had fluctuated between 5% and 10% (Chart 3). This data gains prominence with Mr. Trump serving a second term as President, though Republicans are divided over the skilled immigration issue.

In the 2000s, Indians had accounted for 40-50% of approvals. This rose to over 70% from the mid-2010s (Chart 4).

In 2023, 65% of approved H-1B workers were hired for computer-related jobs. They also received a higher median annual salary than other job types, though managers had a significantly higher average salary (Chart 5).

In 2023, Amazon sponsored the highest number of H-1B visas (2.9% of total approvals), followed by Cognizant Technology Solutions, Infosys, Tata Consultancy, and Google (Table 6).

A profile of H-1B workers

The charts are sourced from Pew Research Centre’s “What we know about the U.S. H-1B visa program”

Chart 1: The % share of H-1B workers approved each fiscal year whose highest level of education is a _____ degree

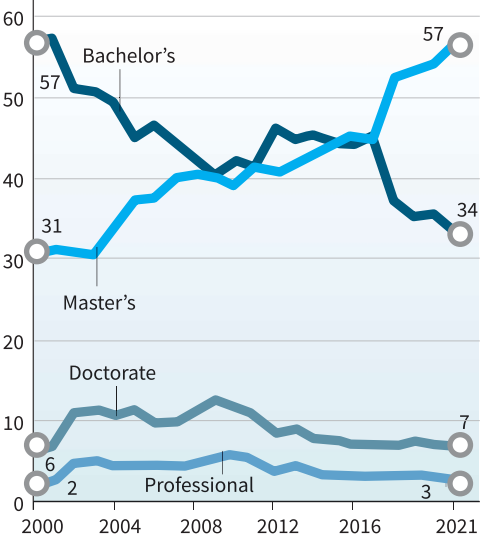


Chart 2: The number of H-1B applications approved each fiscal year. K= 1,000

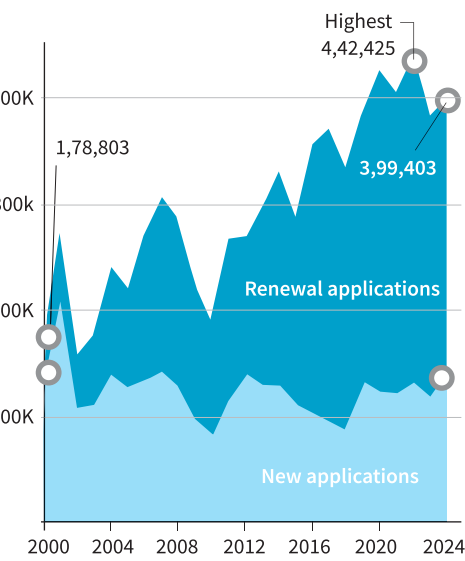


Chart 3: The % share of H-1B applications denied each fiscal year

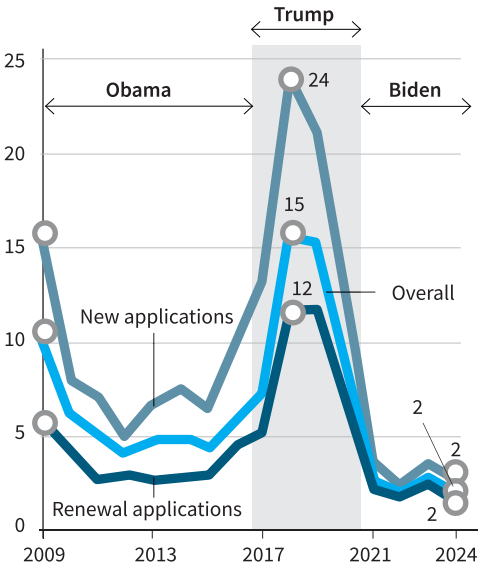


Chart 4: The % share of H-1B workers approved each fiscal year were born in _____

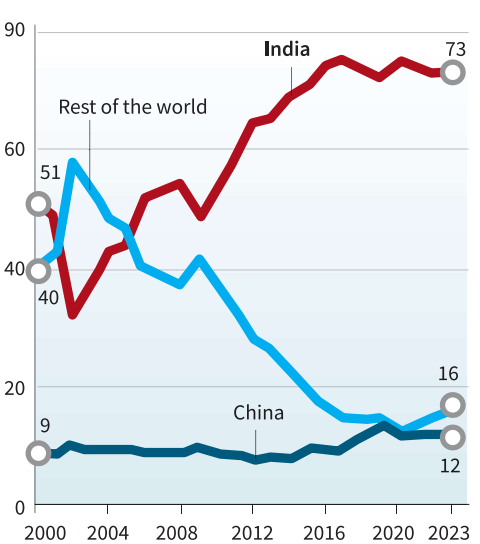


Chart 5: The % and median annual salary of H-1B workers approved in fiscal year 2023, by occupation

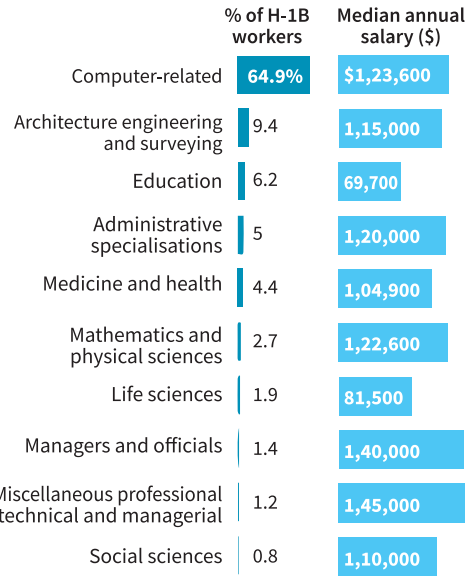


Table 6: Employers with the highest number of H-1B applications approved in fiscal year 2023

Rank	Employer name	Number of approvals	% of total Approvals
1	Amazon.com Services LLC	11,299	2.9%
2	Cognizant Technology Solutions	7,654	2%
3	Infosys Limited	7,349	1.9%
4	Tata Consultancy Services Ltd.	6,914	1.8%
5	Google LLC	5,465	1.4%
6	Microsoft Corp.	4,793	1.2%
7	Apple Inc.	3,821	1%
8	Meta Platforms Inc.	3,371	0.9%
9	JPMorgan Chase Co.	3,066	0.8%
10	Capgemini America Inc.	2,831	0.7%

Text & Context

India's exports declined in the month of February

36.91 In \$ billion, India's exports declined for the fourth month in a row in February to \$36.91 billion due to volatility in petroleum prices and global uncertainties. The country's exports stood at \$41.41 billion in the same month a year ago. PTI

Dumpsites remediated under the Swachh Bharat Mission

701 Out of the 2,424 legacy dumpsites, 701 have been remediated so far under the Swachh Bharat Mission while the work of flattening 1,179 garbage mounds is currently in progress, the Union Housing and Urban Affairs Ministry said. PTI
COMPILED BY THE HINDU DATA TEAM

Why are electoral reforms necessary?

Since when have votes been registered solely through Electronic Voting Machines? Why have certain Opposition parties accused the EC of electoral roll manipulation? Should criminal cases of politicians standing for elections be given wide publicity?
Join FREE Telegram Channel <https://t.me/+Bu7senHpQdhlODg1>

EXPLAINER

Rangarajan R.

The story so far:

The Election Commission (EC) has invited political parties to discuss strengthening the election process. This is in wake of the allegations of manipulation of electoral rolls during the recently concluded assembly elections and issues raised with respect to duplicate Electoral Photo Identity Card (EPIC) numbers in different States.

What are the legal provisions?

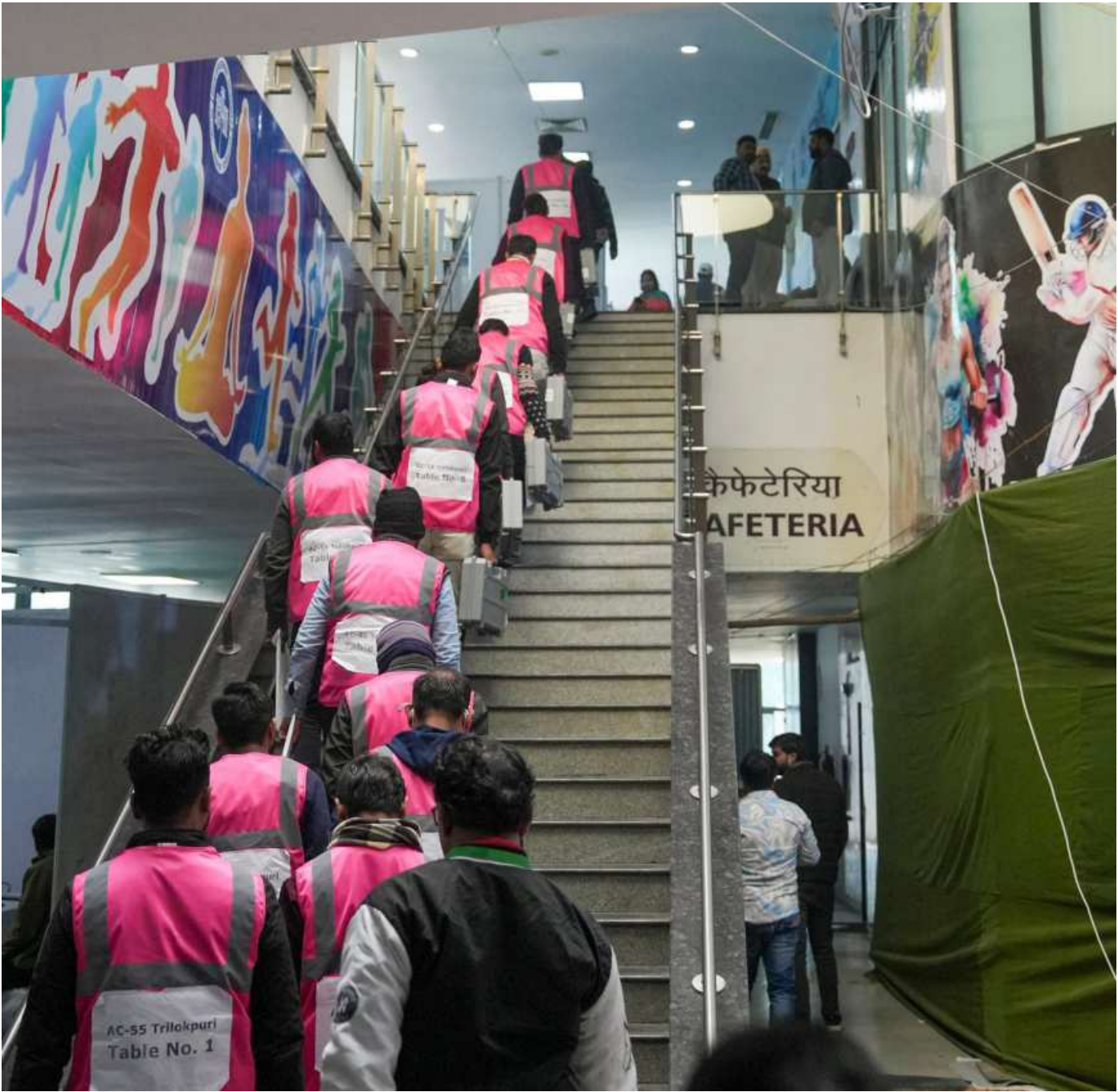
Article 324 of the Constitution provides that the superintendence, direction and control of the preparation of electoral rolls for, and the conduct of, all elections to the Parliament and State legislature shall be vested in the EC. The preparation of electoral rolls is governed by the provisions of the Representation of the People Act, 1950 and related rules, including Registration of Electors Rules, 1960.

The voting process has undergone tectonic changes since the first general election in 1952. In the first two general elections of 1952 and 1957, a separate box was placed for each candidate with their election symbol. Voters had to drop a blank ballot paper into the box of the candidate whom they wanted to vote for. It is only from the third general election in 1962 that ballot papers with names and symbols of candidates was introduced. Subsequently, since the 2004 general elections to the Lok Sabha, Electronic Voting Machines (EVM) have been used in all constituencies. Since 2019, EVMs have been backed by 100% Voter Verifiable Paper Audit Trail (VVPAT) slips in all constituencies.

What are the issues?

There have been a series of issues raised in the past with respect to the voting and counting process. First, there were demands through a Public Interest Litigation (PIL) for reverting to paper ballot papers which was dismissed by the Supreme Court in April 2024. Second, the same PIL demanded 100% matching of VVPAT with EVM count, which at present is carried out for five machines per assembly constituency/segment. The Supreme court, while dismissing this demand as well, had directed that the burnt memory of microcontrollers of 5% of EVMs, which includes that of control units, ballot units, VVPATs, in every assembly segment can be checked and verified by a team of engineers of the EVM manufacturers in case of any suspicion of tampering. The exercise needs to be initiated via a written request from candidates who are placed second or third in a constituency, within seven days of the declaration of election results.

Third, there were allegations of manipulation of electoral rolls in the run up to the Maharashtra and Delhi Assembly elections. The Opposition parties alleged that large number of bogus/fake voters were added to the electoral roll to benefit the ruling party at the Centre. The fourth and current issue relates to identical EPIC numbers for voters belonging to different States like West Bengal, Gujarat, Haryana and Punjab. Opposition parties such as the Trinamool Congress allege that it vindicates their claim of bogus voters being included in the voters' list. The EC has explained that duplication may have arisen because of the earlier decentralised system for allotting EPIC



Need for a revamp: Poll officials carrying EVMs enter the Patparganj counting centre for the Delhi Assembly polls, in New Delhi, on February 8. PTI

Join FREE Whatsapp Channel <https://whatsapp.com/channel/0029Van2VRb6RGJOKH6oBd0F> numbers before shifting to the centralised database on the ERONET platform. It clarified that irrespective of the EPIC number, an elector can cast his/her vote only in their designated polling station in their State or Union Territory.

Apart from the above issues in the election process, there are significant issues related to the campaign process that have to be addressed. First, 'Star Campaigners' of most parties have been guilty of using inappropriate and abusive words against leaders of other political parties, appealing to caste/communal feelings of electors, and making unsubstantiated allegations. Second, candidates of all major political parties breach the election expenditure limit by a wide margin. Further, there are no limits on political party spending during elections. The Centre for Media Studies has estimated that the expenditure during the 2024 Lok Sabha elections was close to ₹1,00,000 crore by various political parties. Such inflated election expenditure fuels corruption resulting in a vicious cycle. Third, as per the report of the Association of Democratic Reforms, the issue of criminalisation of politics has almost reached its nadir with 251 (46%) of the 543 elected MPs in 2024, having criminal cases against them. Of them 170 (31%) face serious criminal charges including rape, murder, attempt to murder and kidnapping.

What are the required reforms?

Free and fair elections is part of the basic structure of our Constitution as declared by the Supreme Court in various cases.

With respect to the electoral process of voting and counting, the following reforms need to be considered and implemented. First, as regards the EVM and VVPAT related aspects, the sample size for the matching of EVM count and VVPAT slips should be decided in a scientific manner by dividing each State into large regions. In case of even a single error, VVPAT slips should be counted fully for the concerned region. This would instil statistically significant confidence in the counting process. Further, as recommended by the EC in 2016, in order to provide a degree of cover for voters at the booth level, 'totaliser' machines can be introduced that would aggregate votes in 14 EVMs before revealing the candidate-wise count. The candidates placed second or third should also utilise the direction of the Supreme Court to demand the verification of 5% of EVMs in each assembly segment in case of any suspected tampering. If any issue is identified, it should be suitably addressed and if there are none, it would put to rest the political speculation.

Second, to address the apprehension of inclusion of fake voters and duplicate EPIC cards, the process of linking citizens' Aadhaar number with EPIC cards may be considered after detailed discussions with all stakeholders and dispelling concerns around right to privacy. Meanwhile, the EC should remove any duplicate voter ID numbers in the electoral roll across States and ensure unique EPIC numbers.

Equally important, if not more, are the reforms needed in the campaign process. First, the EC should be authorised to

revoke the 'Star Campaigner' status of a leader, in case of any serious violation of the Model Code of Conduct (MCC), thereby depriving the party candidates of expenditure relief for their campaigns. Under Paragraph 16A of the Symbols order, the EC has the power to suspend or withdraw the recognition of a recognised political party for its failure to observe MCC or follow lawful directions of the Commission. Strict action under this provision against bigger parties would have a salutary effect in ensuring adherence to the MCC. Second, with respect to election expenditure, the law must be amended to explicitly provide that 'financial assistance' by a political party to its candidate should also be within the limits of election expenditure prescribed for a candidate. There should also be a ceiling on expenditure by political parties. Third, the Supreme Court direction to candidates as well as political parties to issue declarations about criminal antecedents, at least three times before election, in a widely circulated newspaper in the locality and in electronic media, should be strictly enforced. This would enable a discerning voter in exercising a well-informed choice.

The EC and various political parties should engage in a meaningful discussion on all these aspects so that the campaign and electoral processes instil confidence in voters at large.

Rangarajan R is a former IAS officer and author of 'Polity Simplified'. He currently trains civil service aspirants at Officers IAS Academy. Views expressed are personal.

THE GIST

Article 324 of the Constitution provides that the superintendence, direction and control of the preparation of electoral rolls for, and the conduct of, all elections to the Parliament and State legislature shall be vested in the EC.

Apart from the above issues in the election process, there are significant issues related to the campaign process that have to be addressed. First, 'Star Campaigners' of most parties have been guilty of using inappropriate and abusive words against leaders of other political parties, appealing to caste/communal feelings of electors, and making unsubstantiated allegations.

As regards the EVM and VVPAT related aspects, the sample size for the matching of EVM count and VVPAT slips should be decided in a scientific manner by dividing each State into large regions. In case of even a single error, VVPAT slips should be counted fully for the concerned region. This would instil statistically significant confidence in the counting process.

From Page One

India’s goods trade deficit at 42-month low

“Given this, we now expect the current account to witness a surplus of around \$5 billion in Q4 of FY2025, equivalent to around 0.5% of the GDP, in the ongoing quarter, ” the ICRA chief economist added.

India exported services worth \$35.03 billion and imported services worth \$16.55 billion in February 2025. These numbers were \$28.33 billion and \$15.23 billion, respectively, in February 2024.

The trade data assumes significance at a time when India’s currency is depreciating and uncertainties persist from U.S. trade policy.

(With inputs from Reuters)

‘India, New Zealand to strengthen defence ties’

He announced that the two countries would celebrate a century of sporting relationship in 2026.

External Affairs Ministry sources described the memorandum of understanding on defence as “a large omnibus agreement”. Mr. Modi said the two sides had started discussion on a “mutually beneficial Free Trade Agreement [FTA]”.

“This shall increase the potential for bilateral trade and investment. Mutual cooperation and investment shall be encouraged in fields such as dairy, food, processing, and pharma,” he said. He described India and New Zealand as part of a common front against terrorism, and reminded that the two sides dealt with the 26/11 attacks in Mumbai and the attacks in Christchurch on March 15, 2019. Mr. Modi spoke about the activities of pro-Khalistan activists in New Zealand.

Pro-Khalistan elements pushing for an online “referendum” for establishing a Sikh homeland in Punjab have been active in New Zealand and the matter was further elaborated by the Secretary (East) in the Ministry, Jaideep Mazumdar. “We do alert our friends to the activities of anti-India elements in their countries and their abuse of freedom of speech and the democratic freedoms to glorify terror and to threaten attacks against our diplomats. I must say that the Government of New Zealand has been receptive as well as has taken our concerns on board in the past as well,” Mr. Mazumdar said.

In his remarks, Mr. Luxon said New Zealand would expand its diplomatic presence in India by more than 60%, highlighting his country’s commitment to deepen its relationship with India.

Mr. Luxon paid tribute to the Indian community in New Zealand, saying, “The Indian community is the third-largest ethnic group in New Zealand, India is our largest source of skilled migrants and our second largest source of international students. In short, Indian-Kiwis make a massive contribution to New Zealand and I’m proud of what this community does for our country.”

Mr. Luxon had on Sunday announced that New Zealand and India agreed to launch negotiations on a comprehensive FTA. “It is through trade that we can boost the economies of both our countries, providing more jobs and higher incomes for Kiwis and Indians. India and New Zealand have a dynamic, multi-faceted relationship, with 300,000 Kiwi-Indians at its heart,” Mr. Luxon said.

He also joined Mr. Modi on Monday evening at the annual Raisina Dialogue, where he was the keynote speaker.

Rajnath raises SFJ issue with Tulsi Gabbard

The source added that Mr. Rajnath also asked the U.S. to declare the SFJ a terrorist organisation. The two leaders also discussed maritime and other areas of cooperation.

Ms. Gabbard is on a three-day visit to India. She participated in a conclave of Intelligence chiefs on Sunday, and is scheduled to speak at the 10th Raisina Dialogue on Tuesday.

India-U.S. ties came under strain as an Indian citizen and former official of the Research and Analysis Wing, Vikas Yadav, was charged by the U.S. under the previous Joe Biden administration for directing a plot to kill Pannun.

The two leaders in their discussions reaffirmed the growing strength of the India-U.S. bilateral defence partnership, emphasising that strategic security remains a vital pillar of comprehensive global strategic cooperation between the two nations, the Defence Ministry said in a statement. “They reviewed the significant strides made in the areas of military exercises, strategic cooperation, integration of defence industrial supply chains and information-sharing cooperation, especially in the maritime domain, between India and U.S.,” the Ministry said.

Mr. Singh expressed his gratitude to the U.S. Director of National Intelligence for her “steadfast goodwill” and “admiration for Indian culture and heritage”, noting that such sentiments further deepened the bonds of friendship between India and U.S., the Defence Ministry’s statement said.

Speaking to electronic media, Ms. Gabbard said that the persecution of minorities in Bangladesh was a long-standing concern, and “Islamist terrorism” a major cause of concern for President Trump.

“The long-time, unfortunate persecution, killing and abuse of religious minorities – Hindus, Buddhists, Christians, Catholics, and others – has been a major area of concern for the U.S. government and, of course, President Trump and his administration,” Ms. Gabbard said.

The Hindu Bureau
NEW DELHI

India and Australia agreed to deepen cooperation and interoperability across maritime, land, and air domains, including working with multilateral partners. The two countries also decided to focus on cooperation in maritime domain awareness, reciprocal information sharing, industry and science and technology collaboration aside from “exchanges including de-

Indian delegation was headed by Amitabh Prasad, and Australian side was led by Bernard Philip

ployments from each other’s territories”.

This was agreed in the 9th India-Australia defence policy talks held in New Delhi.

The Indian delegation was headed by Joint Secretary Amitabh Prasad, while the Australian side was led

by First Assistant Secretary International Policy Division, Department of Defence, Australia, Bernard Philip.

“Both sides welcomed sustained progress in bilateral defence cooperation, including the growing complexity of defence exercises and exchanges. It included several first-time milestones, finalisation of key agreements and participation in each other’s major defence trade exhibitions,” a Defence Ministry statement said.

Suhasini Haidar
NEW DELHI

China on Monday welcomed Prime Minister Narendra Modi’s statement that India and China have achieved “normalcy” on the border after his meeting with Chinese President Xi Jinping and that the two sides were restoring ties to the pre-2020 state while ensuring that “differences don’t become disputes”.

Mr. Modi’s comments, made to a U.S.-based podcaster, are by far the strongest indicator that New Delhi and Beijing are prepared to move beyond the tensions of the past five years, including the Galwan clashes in which 20 Indian soldiers were killed by PLA soldiers and incursions over the Line of Actual Control.

The comments by Mr. Modi follow months after the Indian Army chief, General Upendra Dwivedi, said the situation at the LAC was “stable but not normal” and that a “degree of stand-off” remained between the two Armies, while experts questioned whether relations can be “normalised” without completing the withdrawal



Strengthening ties: Prime Minister Narendra Modi with Chinese President Xi Jinping in Kazan, Russia, in October 2024. ANI

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of troops. In Beijing, Chinese Ministry of Foreign Affairs spokesperson Mao Ning called Mr. Modi’s comments during the interview with podcaster Lex Fridman a “positive statement on China-India relations”.

Referring to the October 23 Modi-Xi meeting in Russia, the Chinese spokesperson said the two sides “have earnestly implemented the important consensus of the leaders of the two countries, strengthened exchanges and practical cooperation at all levels, and achieved a series of positive results”.

During the interview, Mr. Modi, who has spoken very rarely about the

ments and also pointed to more than “2,000-year history of China-India exchanges, friendly exchanges, mutual learning, and mutual understanding”, echoing Mr. Modi’s words.

“It is the only right choice for China and India to be partners who contribute to each other’s success and to realise the ‘Dance of the Dragon and the Elephant’,” Ms. Mao continued, referring to the Chinese depiction of India as an elephant.

The warm statements follow visits to Beijing by National Security Adviser Ajit Doval and Foreign Secretary Vikram Misri, and meetings between External Affairs Minister S. Jaishankar and Chinese Foreign Minister Wang Yi in the past few months, and could suggest more bilateral exchanges this year. Mr. Modi is expected to travel to China in June to attend the SCO Summit.

Mr. Jaishankar had said earlier this month that officials were working on the resumption of travel links between the two countries, business and tourist visas, the Kailash Mansarovar pilgrimage, and the return of journalists.

India and Australia agree to deepen cooperation across maritime, land, air domains

Bar Council flags rise in misinformation on critical legal issues

The Hindu Bureau
NEW DELHI

The Bar Council of India (BCI) on Monday raised serious concern over the rapid growth of self-styled legal influencers on social media, noting that many of them spread misinformation on critical legal issues without possessing appropriate credentials.

In a statement, the body which regulates the legal profession in India said, “Many such legal influencers who without possessing appropriate credentials, spread misinformation on critical legal issues such as matrimonial disputes, taxation, intellectual property rights, citizenship laws, privacy rights, and GST compliance.”

“Incorrect or misleading interpretations of landmark judgments like the Citizenship Amendment Act (CAA), the Right to Privacy ruling in *Justice K.S. Puttaswamy (Retd.) vs Union of India*, and GST regulations have resulted in widespread confusion, misguided legal decisions, and undue judicial burden,” the body said.

It issued a “stringent warning” against the increasingly prevalent and unethical practice of advo-

The BCI ordered mandatory cessation of unauthorised legal advice dissemination by non-enrolled individuals

cates advertising their legal services through social media, promotional videos, and influencer endorsements. “The BCI expressly denounces the involvement of Bollywood actors, celebrities, and digital media platforms as promotional tools, which clearly violate Rule 36, Chapter II, Part VI of the BCI Rules,” the statement said.

It also ordered mandatory cessation of misleading and unauthorised legal advice dissemination by non-enrolled individuals.

Explicit warning
In July last year, the BCI issued a press release where it “explicitly” warned advocates against unethical practices of advertising their legal services following a judgment of the Madras High Court.

In the ruling, the Madras High Court highlighted that promotional activities through online platforms severely compromise ethical standards and professional integrity.

SC to examine petition on CAG appointment process

The Hindu Bureau
NEW DELHI

The Supreme Court on Monday decided to examine a plea challenging the sole prerogative of the Centre, acting through the Comptroller and Auditor General of India.

Appearing before a Bench headed by Justice Surya Kant, advocate Prashant Bhushan said absolute control by the Centre over the appointment process of a Comptroller and Auditor General (CAG) would gravely affect the independence of a Constitutional authority, which was a watchdog over the financial expenditure and accountability of the Union and State governments and even the Panchayati Raj institutions.

The petition said the CAG must be appointed by the President in consulta-



tion with a non-partisan selection committee comprising the Prime Minister, the Leader of the Opposition and the Chief Justice of India.

The petitioner, Centre for Public Interest Litigation, also represented by advocate Cheryl D’Souza, referred to recent “deviations” in the CAG’s work, including reports on the “pause” in Maharashtra audits, a steady decline on audits on the Union go-

vernment, among others. Mr. Bhushan said Article 148(1) of the Constitution equates the CAG with a Supreme Court judge. A CAG can be removed only for the same reasons and in the same manner as an apex court judge.

Issuing notice to the Union government, Justice Kant, however, asked whether a judicial intervention would amount to re-writing Article 148, which deals with the appointment of a CAG. Article 148, like in the case of Supreme Court judges, is silent about the procedure of appointment. Justice Kant also remarked that one should be able to “trust institutions”.

Mr. Bhushan argued that giving exclusive control to the Executive over appointments to key Constitutional bodies would be a sure recipe for loss of independence.

Manufactured items hasten Feb. WPI inflation to 2.38%

Prices of manufactured products rose to a two-year high of 2.86% in February; non-food primary inflation hastened to 4.84% in the reporting month as against 2.85% in the previous month

Ashokamithran T.
MUMBAI

Wholesale price inflation hastened to 2.38% as cost of manufactured food products, among others, increased in February, from 2.31% in the previous month, according to data from Ministry of Commerce and Industry.

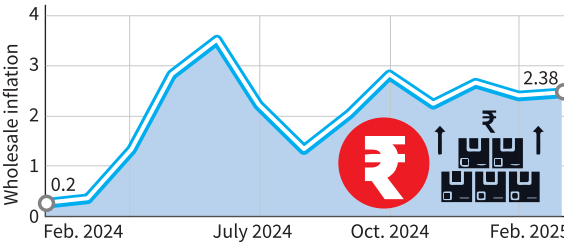
Prices of manufactured products rose to a two-year high of 2.86% in the reporting month.

“Excluding food, core manufactured WPI inflation rose to 1.3% y-o-y from 1% in January. We think

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Slight rise

WPI increased marginally after 3 consecutive months of decline as prices of some food items like vegetable oils and beverages rose



Source: CMIE

core WPI inflation may rise gradually over the coming months, reflecting the rise in international metal prices in February,” said Aashta Gudwani, India Chief

Economist at Barclays Research. Primary articles continued to dis-inflate for six consecutive months coming in at 2.81% in February 2025. Food price in-

flation was at a four-month low of 3.38% in February 2025. “Expectedly, the correction is now tapering,” Ms. Gudwani wrote in the research note. Non-food primary inflation rose to 4.84% in the reporting month as against 2.85% in the previous month. The increase was however on account of a lower base, Ms. Gudwani wrote.

Fuel and power sector experienced a deflation of 0.71%, slowing from a fall in prices by 2.78% in January 2025. Price change in the sector has been in the negative territory for seven months.

India to gain in an uncertain world of tariffs: SBI report

Lalatendu Mishra
MUMBAI

Even as tariff action by U.S. President Donald Trump looms large, the SBI said India would stand to gain in an increasingly uncertain world of tariffs.

“Long trends indicate possible downturn in U.S. GDP growth along with slowdown in U.S. exports and consumption,” the State Bank of India (SBI) said in a report, adding that the decline in exports from India to the U.S. could

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be in the range of 3-3.5% post reciprocal tariffs, if any.

“We estimated decline in exports in the range of 3-3.5% which should be negated through higher export goals across manufacturing and services fronts, as India has diversified its exports kitty, pitched value addition, exploring alternate areas and works on new routes that transcend from Europe to the U.S.A via the Middle-East, re-drawing new supply chain algorithms,” it said.

IOC Board approves boxing’s inclusion in 2028 LA Olympics

Press Trust of India
COSTA NAVARINO (GREECE)

Boxing is set to be included in the programme for the 2028 Los Angeles Olympics after the International Olympic Committee’s (IOC) executive board approved its inclusion ahead of its 144th session starting on Tuesday.

The decision follows the IOC’s granting of provisional recognition to World Boxing last month, effectively sidelining the International Boxing Association (IBA) and transferring authority to the new governing body.

The March 18-21 IOC Session, which will also elect a new president to succeed Thomas Bach, is expected to ratify the executive board’s decision for inclusion of boxing in the 2028 LA Games roster.

“After the provisional recognition of world boxing in February, we were in a position to take this decision so that this recom-

mendation goes to the session,” Bach said after the executive board meeting.

“I am very confident that the session will approve it so that all the boxers of the world then have certainty that they can participate in the Olympic Games L.A. 2028 if their national federation is recognised by world boxing.”

Welcoming the decision, World Boxing President Boris van der Vorst, said: “This is a very significant and important decision for Olympic boxing and takes the sport one step closer to being restored to the Olympic programme.”

Not on initial list

Boxing was not included on the 2028 LA Games initial sports programme approved by the IOC Session in February 2022 because of the ongoing concerns around the then international federation, the International Boxing Association (IBA).



Optimistic: IOC president Bach is confident that boxing will get the green signal for the next edition of the Games. GETTY IMAGES

How climate change is affecting India’s wheat production cycle

The Indian Ocean is warming at an accelerated rate, which in turn is affecting India’s monsoon, on which most of the country’s agriculture depends. The kharif or summer crop season is starting and ending late, which delays the beginning of the rabi season. And wheat is a rabi crop

Priyali Prakash

India recorded its warmest February in 124 years this year. The India Meteorological Department has already raised an alarm for March, saying that the month will experience above normal temperatures and more than the usual number of days with heat waves. The period coincides with the beginning of India’s wheat harvest season, and extreme heat poses a grave threat for the country’s second-most consumed crop, after rice.

Wheat in India

In India, wheat is primarily grown in the northwestern parts of the Indo-Gangetic plains. Primary producers include the states of Uttar Pradesh, Punjab, Haryana, and Madhya Pradesh. Wheat needs a cooler season to grow, and the crop is usually sown between October and December. It is harvested between February and April in the rabi crop season.

The Indian government set a wheat procurement target of 30 million tonnes for the 2025-2026 rabi marketing season, news agency PTI reported in January. The lower procurement target comes despite the agriculture ministry aiming for a record wheat production of 115 million tonnes in the 2024-2025 crop year (July-June), the report added.

In 2024-2025, government wheat procurement was recorded at 26.6 million tonnes. While this exceeded the 26.2 million tonnes procured in 2023-2024, it fell short of the 34.15 million tonne target for the year.

In May 2022, India had prohibited wheat exports. This was shortly after Russia invaded Ukraine, a major wheat-producing country, which disrupted international availability of the food grain and triggered a global price hike.

Heat and wheat

Climate variability itself is not a new phenomenon, but it catches our attention when the crop growth season overlaps with heat wave conditions, Sandeep Mahato of the M.S. Swaminathan Research Foundation (MSSRF), Chennai, told *The Hindu*.

A 2022 study in the *International Journal of Molecular Sciences* noted that increasing global warming is causing heat stress that “triggers significant changes in the biological and developmental process of wheat, leading to a reduction in grain production and grain quality.”

According to the paper’s authors, heat stress is known to affect the growth and development of wheat by altering “physio-bio-chemical processes such as photosynthesis, respiration, oxidative damage, activity of stress-induced hormones, proteins and anti-oxidative enzymes, water and nutrient relations, and yield-forming attributes (biomass, tiller count, grain number, and size) upon exposure to temperatures above the optimum range.”

Stages of wheat growth

According to the UN Food and Agriculture Organisation, stages of wheat growth are defined based on how different organs of the plant develop. This can be broadly grouped into four stages:

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In India, wheat is primarily grown in the Indo-Gangetic plains. Producer states include Uttar Pradesh, Punjab, Haryana, and Madhya Pradesh. ANI

Optimal temperature required for growing wheat	Stages	Optimum temperature	Minimum temperature	Maximum temperature
	Seed germination	20-25 ± 1.2	3.5 - 5.5 ± 0.44	35 ± 1.02
	Root growth	17.2 ± 0.87	3.5 ± 0.73	24.0 ± 1.21
	Shoot growth	18.5 ± 1.90	4.5 ± 0.76	20.1 ± 0.64
	Leaf initiation	20.5 ± 1.25	1.5 ± 0.52	23.5 ± 0.95
	Terminal spikelet	16.0 ± 2.30	2.5 ± 0.49	20.0 ± 1.60
	Anthesis	23.0 ± 1.75	10.0 ± 1.12	26.0 ± 1.01
	Grain filling duration	26.0 ± 1.53	13.0 ± 1.45	30.0 ± 2.13

Join FREE Whatsapp Channel <https://whatsapp.com/channel/0029Van2VRb6RGJOKH6oBd0F> and similar trends have been predicted for March. This is also the peak season for wheat harvest, and the ideal temperature in the later stages of the plant’s growth should not cross 30° C.

“High temperatures cause early flowering and faster ripening, shortening the grain-filling period. This results in lighter grains with lower starch accumulation, reducing the total wheat output,” Prakash Jha, assistant professor of agricultural climatology at Mississippi State University, told *The Hindu*. “Extreme heat causes wheat to develop higher protein content but lower starch, making the grain harder and affecting milling quality. Farmers may face lower market prices due to reduced grain weight and quality issues,” he added.

Low crop yield also tends to make farmers desperate and result in overuse of fertilizers, fungicides, etc. Nikhil Goveas, lead climate advisor with the Environmental Defense Fund, told *The Hindu*. “Higher but inefficient use of resources is another cascading effect of heat-stress challenges in crops.”

According to experts, the real problem starts with the oceans. The Indian Ocean is warming at an accelerated rate. A 2024 study conducted by scientists at the Indian Institute of Tropical Meteorology, Pune, noted that the water body will likely be in a “near-permanent heat wave state” mainly as a result of global warming by the end of the century.

The frequency of marine heat waves is expected to increase tenfold, from the current average of 20 days per year to 220-250 days per year, the study added. A warming Indian Ocean will in turn alter India’s monsoon, on which most of the country’s agriculture depends. For example, the kharif or summer crop season is starting and ending late, which inevitably delays the beginning of the rabi season.

Wheat is a rabi crop. If its sowing starts late, the later stages of plant growth will coincide with early heat waves in India. February 2025 was warmer than usual,

challenge of the climate crisis on our food systems. The earth is getting warmer. We need to think about not just one crop but all crops: get timings right, have our information and weather systems updated with the knowledge of what to expect, and undertake mitigation efforts against the challenges.”

“The larger question here is to be able to guarantee food security,” Mahato of MSSRF Chennai said. “We have to focus on addressing yield gaps. This ties into the issue of management of resources like fertilizers, pest control, etc.” According to Mahato, immediate policy support to farmers to deal with heat stress effects on wheat can be in the form of compensation, but there are more long term solutions that need to be incorporated into our agricultural practices.

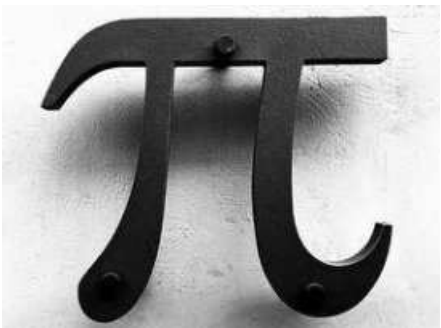
“Changes in agricultural management strategies to support early sowing of crops in areas that are likely to see early heat waves, or introducing improved yield varieties with shorter growth duration, are some policy changes that can alleviate heat stress on wheat,” he added. “There is no compromise that can be done on improving production, and that should be the central goal to the adaptation question.” “Policymakers must take a multi-pronged approach, combining scientific research, financial support, technological solutions, and farmer education to protect wheat crops from rising heat stress,” according to Jha. “This includes promoting heat-resistant wheat varieties, adjusting sowing dates, financial support and crop insurance, and weather monitoring and advisories.”

Adaptation and mitigation Food security is central to the adaptation and mitigation strategies officials use to lower the heat stress on wheat crops. “Wheat is ... important for farmers because it can be consumed immediately, so part of the produce is always saved for household consumption,” Goveas said.

Farmers rely on older varieties of the crop because accessibility is a challenge, with problems related to the supply chain, costs, etc. Climate-resilient varieties are important, but they are not a silver bullet solution to the challenge, Goveas added, “The problem is a deeper



Visual: Name this man, the first scientist to isolate one particular element and win a Nobel Prize for it. The element in question is so viciously reactive, it has been called a “savage beast.” Its group is known as the “salt-formers.” PUBLIC DOMAIN



A pi symbol on a wall in Nafplio, Greece. TASO KATSIONIS/UNSPASH

Pi Day was on March 14. Why is it celebrated?

Associated Press

Mathematics enthusiasts around the world, from college students to rocket scientists, celebrate Pi Day, which is on March 14 every year. The date was chosen because it can be written 3/14 – the first three digits of an infinite number with many practical uses.

Simply put, pi is a mathematical constant that expresses the ratio of a circle’s circumference to its diameter. It figures into numerous formulas used in physics, astronomy, engineering, and other fields, dating back thousands of years to ancient Egypt, Babylon, and China.

Pi Day itself dates to 1988, when physicist Larry Shaw began celebrations at a science museum in San Francisco. The holiday didn’t really gain national recognition until, in 2009, the US Congress officially designated every March 14 to be the big day in the hopes of spurring more interest in math and science. Fittingly, the day is also Albert Einstein’s birthday.

Pi is considered a constant number. It is also mathematically irrational. Long before computers, scientists such as Isaac Newton spent hours calculating decimal places by hand. The first algorithms that calculated pi up to record-setting lengths of several million digits were based on formulae published by Indian mathematician Srinivasa Ramanujan in 1914.

Today, using sophisticated computers,

The number is key to accurately pointing an antenna towards a satellite. It helps figure out everything from the size of a massive cylinder needed in refinery equipment to the size of paper rolls used in printers

researchers have come up with trillions of digits for pi after the decimal point, but there is no end.

The number didn’t get its name until 1706, when Welsh mathematician William Jones began using the Greek symbol for the number. It’s the first Greek letter in the words “periphery” and “perimeter,” and pi is the ratio of a circle’s periphery, or circumference, to its diameter.

The number is key to accurately pointing an antenna towards a satellite. It helps figure out everything from the size of a massive cylinder needed in refinery equipment to the size of paper rolls used in printers.

Pi is also useful in determining the necessary scale of a tank that serves heating and air conditioning systems in buildings of various sizes.

Space agencies like ISRO use pi to calculate orbits, the positions of planets, elements of rocket propulsion, and spacecraft communication.

NASA holds its annual Pi Day Challenge online, offering games and puzzles, such as calculating the orbit of an asteroid or the distance a moon rover would need to travel each day to survey a certain area.

As for Einstein, possibly the world’s best-known scientist, he was born on March 14, 1879, in Germany. The value of pi was used in many of his breakthrough theories, and now Pi Day gives the world another reason to celebrate his achievements.

The famed physicist Stephen Hawking also died on March 14, 2018, at age 76. And he once said, “One of the basic rules of the universe is that nothing is perfect. Perfection simply doesn’t exist. Without imperfection, neither you nor I would exist.”

Ironically, pi is the perfect example.

THE SCIENCE QUIZ

Elements and their cliques in the periodic table

Vasudevan Mukunth

QUESTION 1

Elements of this group in the periodic table are called X because they are present in the vast majority of ore-bearing rock on the earth. All but one of these elements are also primordial: their nuclides existed in their present since before the earth was formed. Name X.

QUESTION 2

This group in the periodic table gets its name from the Greek for “to choke,” referring to the property of one of its member elements to asphyxiate people who have inhaled large quantities of it. Name the element in particular.

QUESTION 3

All elements in this group of the periodic table have three electrons in the valence shell of their atoms. Thus the International Union of Pure and Applied Chemistry suggested these elements be called _____ in 1970. Fill in the blank.

QUESTION 4

Elements in this group are sometimes called the _____ — a name referring to their atoms’ ability to bond in tetrahedral arrangements like that found in diamond, and from the Green for “diamond-like”. Indeed, many of their compounds also have a diamond-like hardness. Fill in the blank.

QUESTION 5

Of the group 9 elements, the atom of _____ alone bucks the Aufbau principle, which states that electrons in

an atom fill a lower energy shell completely before moving to a higher energy one. But as a result, this element is an exceptional catalyst. Name it.

Answers to March 13 quiz:

- Entity found in 1964 that later revealed universe’s structure – **Ans: Cosmic microwave background**
- Geologist who posited continental drift – **Ans: Alfred Wegener**
- Originator of elliptic orbits in the heliocentric model – **Ans: Johannes Kepler**
- Scientist who found genetic mutations are source of diversity – **Ans: Theodosius Dobzhansky**
- Element used to explain combustion before oxygen – **Ans: Phlogiston**

Visual: **Margaret Hamilton**

First contact: Priyanka Jarolia | Tamal Biswas | K.N. Viswanathan | Prajwal Pawar | Anmol Agrawal



Visual: Name this man, the first scientist to isolate one particular element and win a Nobel Prize for it. The element in question is so viciously reactive, it has been called a “savage beast.” Its group is known as the “salt-formers.” PUBLIC DOMAIN

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

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